

Database-Backed Websites

No screens



Prof. Lydia Chilton
COMS 4170
4 March 2019

Say your name



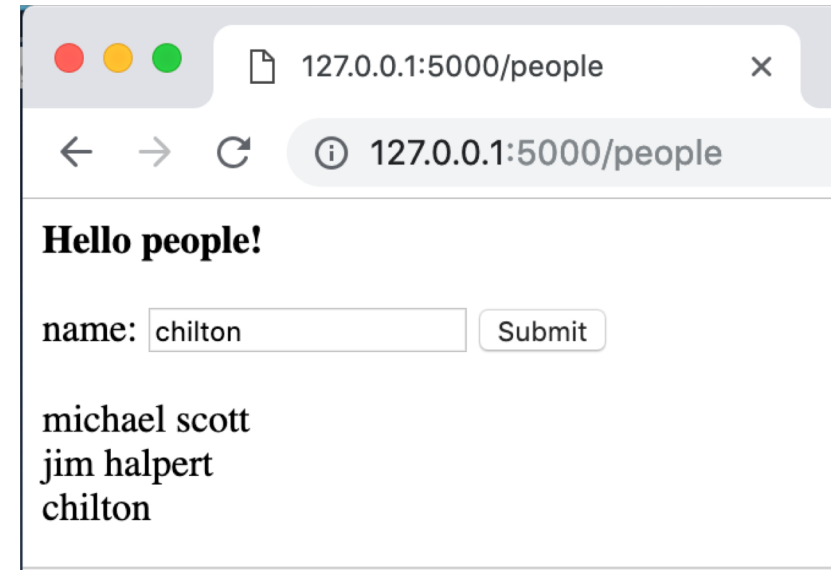
Goal 1

Build websites that suit the needs and abilities of users

The main goal of many websites is to
display information users need.

Last Time: We saw how to send and store data to the server (the backend).

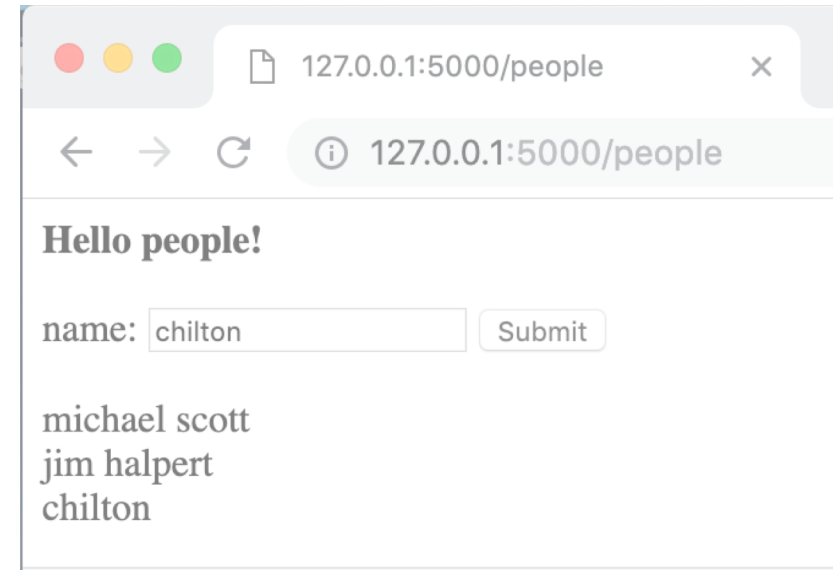
```
1 from flask import render_template
2
3 from flask import Response, request, jsonify
4 app = Flask(__name__)
5
6
7 current_id = 2
8 data = [
9     {
10         "id": 1,
11         "name": "michael scott"
12     },
13     {
14         "id": 2,
15         "name": "jim halpert"
16     },
17 ]
18
19
20
21
22
23
24
25 @app.route('/add_name', methods=['GET', 'POST'])
26 def add_name():
27     global data
28     global current_id
29
30     json_data = request.get_json()
31     name = json_data["name"]
32
33     # add new entry to array with
34     # a new id and the name the user sent in JSON
35     current_id += 1
36     new_id = current_id
37     new_name_entry = {
38         "name": name,
39         "id": current_id
40     }
41     data.append(new_name_entry)
42
43     #send back the WHOLE array of data, so the client
44     return jsonify(data = data)
45
```



```
1 var saveName = function(name){
2     var data_to_save = {"name": name}
3     $.ajax({
4         type: "POST",
5         url: "add_name",
6         dataType: "json",
7         contentType: "application/json; charset=utf-8",
8         data: JSON.stringify(data_to_save),
9         success: function(result){
10             var all_data = result["data"]
11             data = all_data
12             displayNames(data)
13         },
14     },
```

Storing Data in an array is fine for this class. But you need to know how databases work.

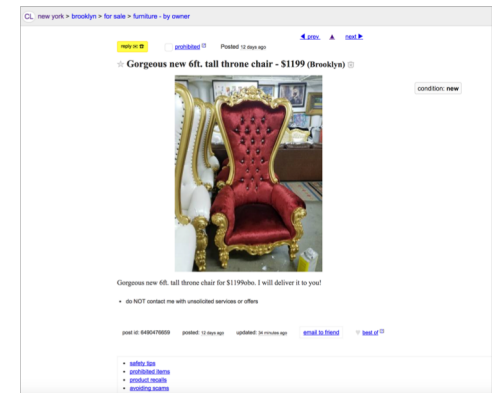
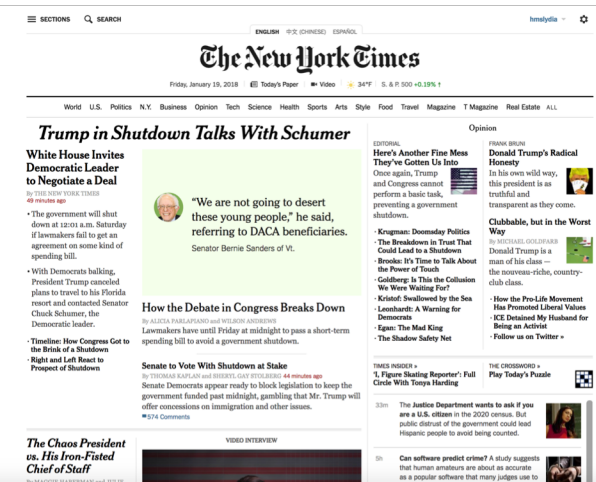
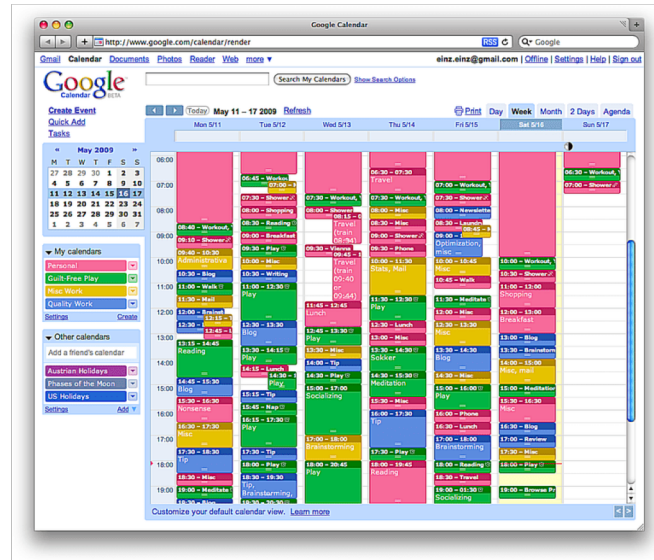
```
1 from flask import render_template
2
3 from flask import Response, request, jsonify
4 app = Flask(__name__)
5
6
7 current_id = 2
8 data = [
9     {
10         "id": 1,
11         "name": "michael scott"
12     },
13     {
14         "id": 2,
15         "name": "jim halpert"
16     },
17 ]
18
19
20
21
22
23
24
25 @app.route('/add_name', methods=['GET', 'POST'])
26 def add_name():
27     global data
28     global current_id
29
30     json_data = request.get_json()
31     name = json_data["name"]
32
33     # add new entry to array with
34     # a new id and the name the user sent in JSON
35     current_id += 1
36     new_id = current_id
37     new_name_entry = {
38         "name": name,
39         "id": current_id
40     }
41     data.append(new_name_entry)
42
43     #send back the WHOLE array of data, so the client
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```
var saveName = function(name){
    var data_to_save = {"name": name}
    $.ajax({
        type: "POST",
        url: "add_name",
        dataType: "json",
        contentType: "application/json; charset=utf-8",
        data: JSON.stringify(data_to_save),
        success: function(result){
            var all_data = result["data"]
            data = all_data
            displayNames(data)
        },
    },
```

Database-backed Websites

This class is not about backend development



But front-ends and back-ends are tightly coupled.
So you need to know something about back-end databases
To create awesome websites

This website has no database

User Interface Design

COMS 4170 · Spring 2018

[Home](#) [Syllabus](#) [Assignments](#) ▾

[Piazza](#)

Part 1 Build websites that suit the needs and abilities of users.

Part 2 When the needs and abilities of users are uncertain, design systems by learning from iteration and experimentation.

INSTRUCTOR

[Prof. Lydia Chilton](#)

OH: Tuesday 3-4 pm, CEPSR 612

Please contact staff through Piazza only

TAS

Tessa Hurr

Eleanor Murguia

Lucille Sui

WEEKLY SCHEDULE

Lecture

Mon, Wed 4:10-5:25pm, 413 Kent Hall

But many websites do. They are basically interfaces to a database.

The image displays four overlapping browser windows, each representing a different type of website interface:

- Amazon.com:** Shows the Amazon Books homepage with a search bar, navigation menu, and various book recommendations like 'The Craft of Research' and 'A Manual for Writers of Research Papers, Theses, and Dissertations'.
- Facebook:** Shows a post titled 'PictureCorrect Photography Tips' with a blue header and a list of user comments and likes.
- Gmail:** Shows an email inbox with a list of messages, including one from 'Baldwin, BPS' and another from 'Bloglovin' - Not that I know of. Sometimes blocked sites come in on a hug'.
- Craigslist:** Shows the 'SF bay area' search results page with multiple columns for 'community', 'housing', 'jobs', 'personals', and 'discussion forums'.

Amazon: Database of books

amazon prime Books

Departments EN Hello, Lydia

Books

Popular in Books

- Award Winners
- Bargain Books
- Best Books of the Month
- Best Books of 2017
- Books in Spanish
- Children's Books
- Deals in Books
- Top 20 Lists in Books

More in Books

- 100 Books to Read in a Lifetime
- Amazon Book Review Blog
- Amazon Books on Facebook
- Amazon Books on Twitter
- Amazon First Reads

Amazon Kindle

- Kindle eBooks
- Kindle Deals
- Kindle Unlimited
- Prime Reading
- Spanish Kindle eBooks

Textbooks

- Textbooks Store
- Textbook Rentals
- Sell Us Your Books
- Kindle eTextbooks

The Craft of Research, Third Edition
Wayne C. Booth, ...Gregory G. Colomb...
Paperback
★★★★☆ 384

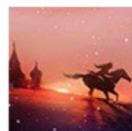
A Manual for Writers of Research Papers, Theses...
Kate L. Turabian, Wayne C. Booth...
Paperback
★★★★☆ 753

Academic Writing for Graduate Students...
John M. Swales, Christine B. Feak
Paperback
★★★★☆ 128
\$25.65 ✓prime

The Craft of Research, 2nd edition
Wayne C. Booth, Joseph M. Williams...
Paperback
★★★★☆ 384

A Manual for Writers of Research Papers, Theses...
Kate L. Turabian, Wayne C. Booth...
Paperback
\$18.00 ✓prime

More from the Amazon Book Editors



Best Books of the Month
Top 10
Literature & Fiction
Kids & Teens Books
Mystery & Thriller
See all categories



Celebrity Picks 2017
Sheryl Sandberg
John Green
Gabrielle Union
Denis Leary
See all Celebrity Picks



Best Books of 2017
Top 100 Print Books
Fiction
Children's Books
Biographies & Memoirs
See all



Amazon Book Review
Weekend Reading
Resolution Cage Match
Graphic Novels for Kids
Sticky Fingers: Jann Wenner
See more posts

YouTube: Database of videos

The image shows a YouTube interface. At the top, the YouTube logo is on the left, and a search bar contains the text "windows 95 jennifer aniston matthew perry". To the right of the search bar are icons for video, grid, notifications (with a red '9+' badge), and a profile picture. The main video player shows a scene from the TV show Friends with three characters. Below the video, the title "Windows 95 Video Guide with Matthew Perry & Jennifer Aniston" is displayed, along with "216,782 views", "2K" likes, and "48" comments. A "SHARE" button and a "SUBSCRIBE 201K" button are also visible. Below the video, there is a "Favorite Videos" section with a channel name, a "Published on Dec 12, 2016" date, and a link to a playlist. To the right of the main video is a "Up next" section with an "AUTOPLAY" toggle. It lists several recommended videos, each with a thumbnail, title, channel name, and view count.

YouTube

windows 95 jennifer aniston matthew perry

Up next

AUTOPLAY

Friends - The One that Goes Behind the Scenes
Favorite Videos ✓
1.8M views
42:30

S11 E08
Would I Lie to You? - S11 E08 (NEW WILTY 19th January)
David Mitchell
Recommended for you
New
28:34

Actor Replacements That Totally Ruined The Show
Looper ✓
3M views
10:04

Inside Matthew Perry's Tragic Real Life Story
Nicki Swift ✓
952K views
5:07

Friends - ET On VH1: Behind The Friends Finale
Favorite Videos ✓
1M views
42:29

Microsoft Windows 95
REACT S7 · E19
TEENS REACT TO WINDOWS 95
FBE ✓
12M views
8:27

Friends - Ross and Monica's Cousin
Favorite Videos ✓
3.6M views
4:53

Windows 95 Video Guide with Matthew Perry & Jennifer Aniston

216,782 views

2K 48 SHARE

Favorite Videos ✓
Published on Dec 12, 2016

Watch all about the show Friends in a single playlist - <https://www.youtube.com/playlist?list...>
Subscribe and watch scenes from all seasons of Friends on my channel - <https://www.youtube.com/channel/UCA8V...>
SHOW MORE

SUBSCRIBE 201K

GMail: Database of emails

The screenshot shows a Gmail inbox interface. The browser address bar displays `https://mail.google.com/mail/u/0/#inbox`. The page title is "Inbox (2) - jeffrey.bernad...". The interface includes a search bar with "Loading..." and a user profile for "Jeffrey". The main content area shows a list of 14 emails in the "Primary" tab. The left sidebar contains navigation options: "COMPOSE", "Inbox (2)", "Sent Mail", "Drafts (54)", "Need to Read", and "Technology Coach". The right sidebar shows a "Search people..." field and a list of contacts, with "Cadwallader, Julie" highlighted.

Primary	Social	Promotions	Updates
<input type="checkbox"/> ☆ ▶ Baldwin, BPS (2)			
<input type="checkbox"/> ☆ ▶ Feldmann, Ann			
<input type="checkbox"/> ☆ ▶ me, Lambert (2)			
<input type="checkbox"/> ☆ ▶ me			
<input type="checkbox"/> ☆ ▶ me, Braasch, Kiamm (3)			
<input type="checkbox"/> ☆ ▶ me, Cox (2)			
<input type="checkbox"/> ☆ ▶ Tripple, Todd			
<input type="checkbox"/> ☆ □ donotreply			
<input type="checkbox"/> ☆ ▶ Ann Feldmann			
<input type="checkbox"/> ☆ ▶ me, Campbell (7)			
<input type="checkbox"/> ☆ ▶ Toelle, me (3)			
<input type="checkbox"/> ☆ ▶ me, Evon (4)			
<input type="checkbox"/> ☆ ▶ Jeffrey Bernadt			

Search people...

- Jed Givens
- Ann Feldmann
- Ann Feldmann
- Cadwallader, Julie
- Christopher Kessell
- Courtney Saffold
- Jeanette Carlson
- Johnson, Stephanie
- Kelly Bernadt
- Loomis, Phillip
- Robert Mason
- Shannon Gier
- Todd Tripple
- Toledo, Julian (Delor...

Facebook: Database of posts



The image shows a screenshot of a Facebook post from the page "PictureCorrect Photography Tips". The post is titled "What is your Photography-Related New Year's Resolution??" and was posted 15 minutes ago. It has received two likes from Adel Gomaa and Richard Schneider. Below the main post, there are several comments from other users, each with a small profile picture and their own resolution. The comments are from Sadi Molloy, Richard, James Donnelly, Jose Antonio Rubido, Deacon Jonathan Jerome Johnson, Latu Peti Vimahi Manulua-hafoka, Tina Taylor Hammer, and Stefanie Bakewell.

facebook

PictureCorrect Photography Tips
What is your Photography-Related New Year's Resolution??
15 minutes ago · Like · Comment

Adel Gomaa and Richard Schneider like this.

Sadi Molloy get my business looking more professional: car signed: tick, making up portrait folders: tick, stickers & cd covers: still to do... its getting there though.
11 minutes ago · Flag

PictureCorrect Photography Tips My resolution for 2011 is to capture more landscape photos outside the U.S. and add more countries to my portfolio! What is yours?
-Richard
11 minutes ago · Flag

James Donnelly Larger concerts to cover and improve my portrait editing style/skill
10 minutes ago · Flag

Jose Antonio Rubido To push my photpography foward full throttle
9 minutes ago · Flag

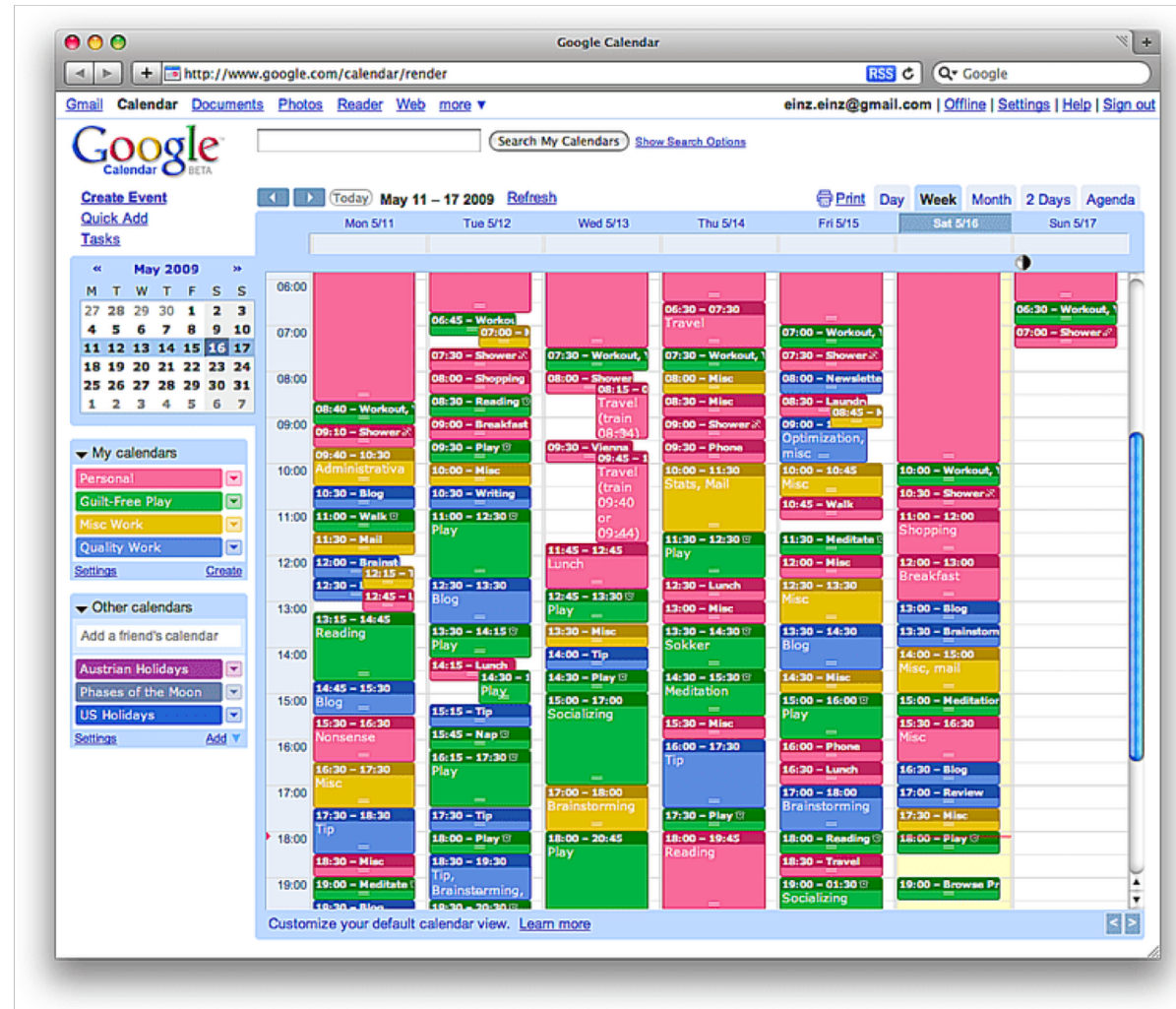
Deacon Jonathan Jerome Johnson To learn more and enhance the quality of my shots!
5 minutes ago · Flag

Latu Peti Vimahi Manulua-hafoka learn learn learn!!!
4 minutes ago · Flag

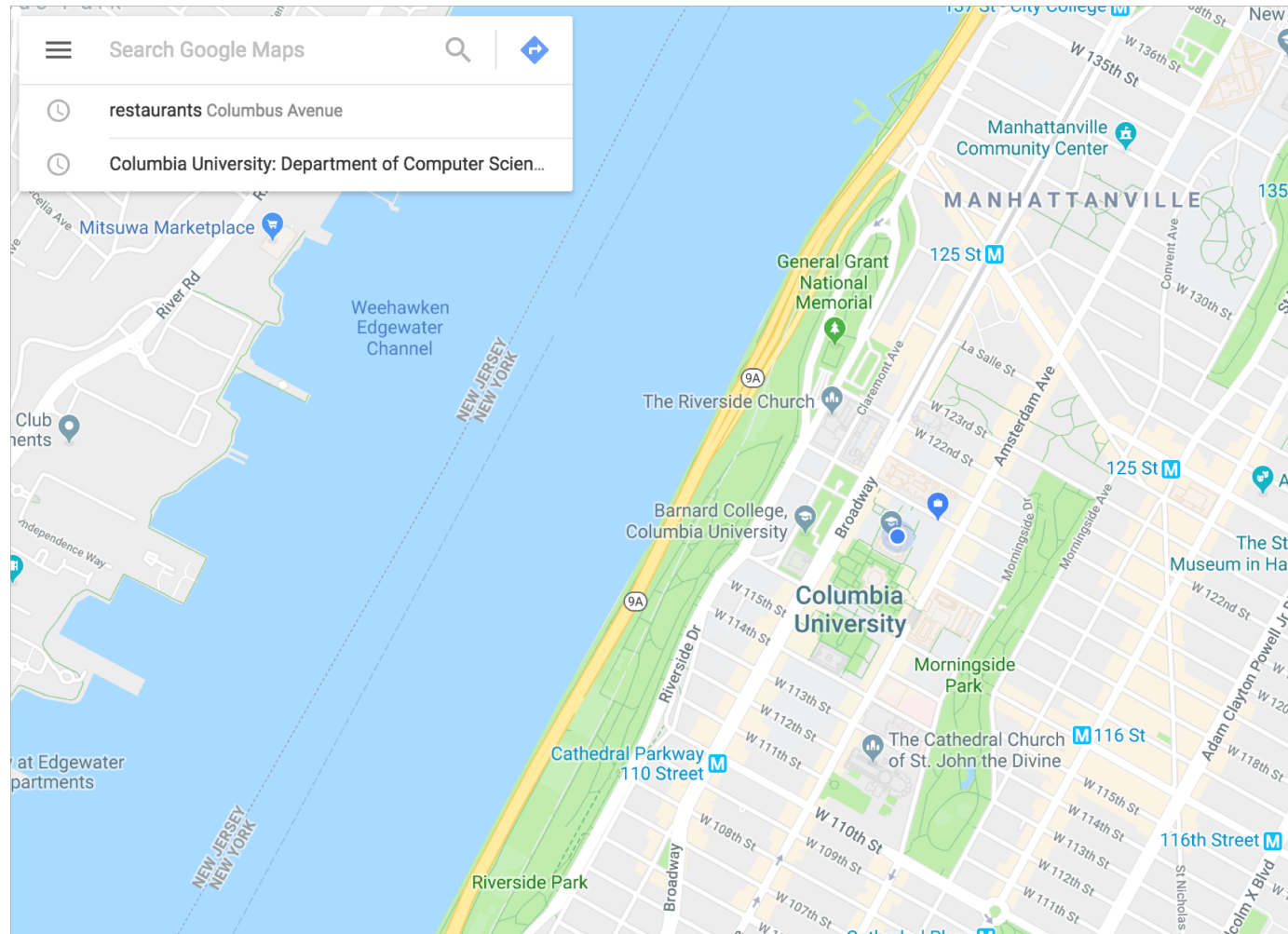
Tina Taylor Hammer Get my new business moving and have it pay for that lens and other equipment that I want (and a little for me too).
2 minutes ago · Flag

Stefanie Bakewell get a website up so that i can get clients full steam ahead
about a minute ago · Flag

GCalendar: Database of events



Google Maps: A database of locations



New York Times: Database of news articles

SECTIONS SEARCH hmslydia

ENGLISH 中文 (CHINESE) ESPAÑOL

The New York Times

Friday, January 19, 2018 Today's Paper Video 34°F S. & P. 500 +0.19% ↑

World U.S. Politics N.Y. Business Opinion Tech Science Health Sports Arts Style Food Travel Magazine T Magazine Real Estate ALL

Trump in Shutdown Talks With Schumer

White House Invites Democratic Leader to Negotiate a Deal

By THE NEW YORK TIMES 49 minutes ago

- The government will shut down at 12:01 a.m. Saturday if lawmakers fail to get an agreement on some kind of spending bill.
- With Democrats balking, President Trump canceled plans to travel to his Florida resort and contacted Senator Chuck Schumer, the Democratic leader.
- **Timeline: How Congress Got to the Brink of a Shutdown**
- **Right and Left React to Prospect of Shutdown**



“We are not going to desert these young people,” he said, referring to DACA beneficiaries.

Senator Bernie Sanders of Vt.

How the Debate in Congress Breaks Down

By ALICIA PARLAPIANO and WILSON ANDREWS

Lawmakers have until Friday at midnight to pass a short-term spending bill to avoid a government shutdown.

Senate to Vote With Shutdown at Stake

By THOMAS KAPLAN and SHERYL GAY STOLBERG 44 minutes ago

Senate Democrats appear ready to block legislation to keep the government funded past midnight, gambling that Mr. Trump will offer concessions on immigration and other issues.

574 Comments

The Chaos President vs. His Iron-Fisted Chief of Staff

By MAGGIE HABERMAN and JULIE

VIDEO INTERVIEW

Opinion

EDITORIAL

Here's Another Fine Mess They've Gotten Us Into

Once again, Trump and Congress cannot perform a basic task, preventing a government shutdown.



- **Krugman: Doomsday Politics**
- **The Breakdown in Trust That Could Lead to a Shutdown**
- **Brooks: It's Time to Talk About the Power of Touch**
- **Goldberg: Is This the Collusion We Were Waiting For?**
- **Kristof: Swallowed by the Sea**
- **Leonhardt: A Warning for Democrats**
- **Egan: The Mad King**
- **The Shadow Safety Net**

FRANK BRUNI

Donald Trump's Radical Honesty

In his own wild way, this president is as truthful and transparent as they come.



Clubbable, but in the Worst Way

By MICHAEL GOLDFARB

Donald Trump is a man of his class — the nouveau-riche, country-club class.



- **How the Pro-Life Movement Has Promoted Liberal Values**
- **ICE Detained My Husband for Being an Activist**
- **Follow us on Twitter »**

TIMES INSIDER »

'I, Figure Skating Reporter': Full Circle With Tonya Harding

THE CROSSWORD »

Play Today's Puzzle



33m The **Justice Department** wants to ask if you are a **U.S. citizen** in the 2020 census. But public distrust of the government could lead Hispanic people to avoid being counted.







5h **Can software predict crime?** A study suggests that human amateurs are about as accurate as a popular software that many judges use to




Craigslist: Database of sales posts

CL new york > brooklyn > for sale > furniture - by owner

reply  prohibited  Posted 12 days ago [← prev](#)  [next ▶](#)



☆ **Gorgeous new 6ft. tall throne chair - \$1199 (Brooklyn)** 



condition: new

Gorgeous new 6ft. tall throne chair for \$1199obo. I will deliver it to you!

- do NOT contact me with unsolicited services or offers

post id: 6490476659 posted: 12 days ago updated: 34 minutes ago [email to friend](#)  [best of](#) 

- [safety tips](#)
- [prohibited items](#)
- [product recalls](#)
- [avoiding scams](#)

Why didn't I make the class website a database?

Columbia University

User Interface Design

COMS 4170 - Spring 2018

Home Syllabus Assignments - Piazza

Part 1 Build websites that suit the needs and abilities of users.
Part 2 When the needs and abilities of users are uncertain, design systems by learning from iteration and experimentation.

INSTRUCTOR	TAs	WEEKLY SCHEDULE
Prof. Lydia Chilton	Tessa Hurr Eleanor Murgula Lucille Sai	Lecture

PH: Tuesday 5-6pm, CS588 613
Please contact staff through Piazza only

amazon prime

Departments - Browsing History - Lydia's Amazon.com Today's Deals Gift Cards Registry Sell Help

Books Advanced Search New Releases Amazon Charts Best Sellers & More The New York Times® Best Sellers Children's Books Textbooks Textbook Ref

Popular in Books

- Award Winners
- Bargain Books
- Best Books of the Month
- Best Books of 2017
- Books in Spanish
- Children's Books
- Deals in Books
- Top 20 Lists in Books

More in Books

100 Books to Read in a Lifetime
Amazon Book Review Blog
Amazon Books on Facebook
Amazon Books on Twitter
Amazon First Reads

Amazon Kindle

- Kindle eBooks
- Kindle Deals
- Kindle Unlimited
- Prime Reading
- Spanish Kindle eBooks

Textbooks

- Textbooks Store
- Textbook Rentals
- Sell Us Your Books
- Top Kindle eBooks

CL: new york > brooklyn > for sale > furniture - by owner

Posted 12 days ago

Gorgeous new 6ft. tall throne chair - \$1199 (Brooklyn)

condition: new

Gorgeous new 6ft. tall throne chair for \$1199. I will deliver it to you!

- do NOT contact me with unrelated services or offers

post id: 649047659 posted: 12 days ago updated: 3d minutes ago email to friend best of

- saifu tip
- published items
- contact results
- avoiding scams

Inbox (2) - Jeffrey bernardi

https://mail.google.com/mail/u/0/#inbox

Imported From First Holiday Guide | TVG Web Help Desk Pixabay - Free Imag Tech Tools For Teac App Status Dashb

Jeffrey

Mail - 1-14 of 14

COMPOSE

Inbox (2)
Sent Mail
Drafts (54)
Need to Read
Technology Coach

Primary Social Promotions Updates

Bloglovin' - Not that I know of. Sometimes blocked sites come in on a hug 11:08 am
Ann Feldmann Fwd: 21st Century Classroom Visit? - Ann Feldmann District Technology 10:18 am
me, Lambert (2) 8th Period - Hey, Jeff. I am planning on doing the Mystery Hangout lesson 8:05 am

A database is necessary when multiple users need to:
Create, Read, Update and Delete content
(interact with data)

facebook

craigslist

SF bay area sfo sby eby pen nby scz

community housing jobs

accounting+finance
admin / office
arch / engineering
art / media / design
biotech / science
business / mgmt
customer service
education
/ bev / hosp
labor
merced
modesto
monterey
net engineers
/ paralegal
ufacturing
letting / pr / ad
ical / health
rofit sector
estate
/ wholesale
/ biz dev
/ spa / fitness
city
id trade / craft
ware / qa / dba
rms / network
hical support
port
lm / video
/ info design
/ editing
/ time

us cities
us states
canada
cl worldwide

gigs

My calendars

May 2009

M	T	W	T	F	S	S
27	28	29	30	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7

Interacting with Databases

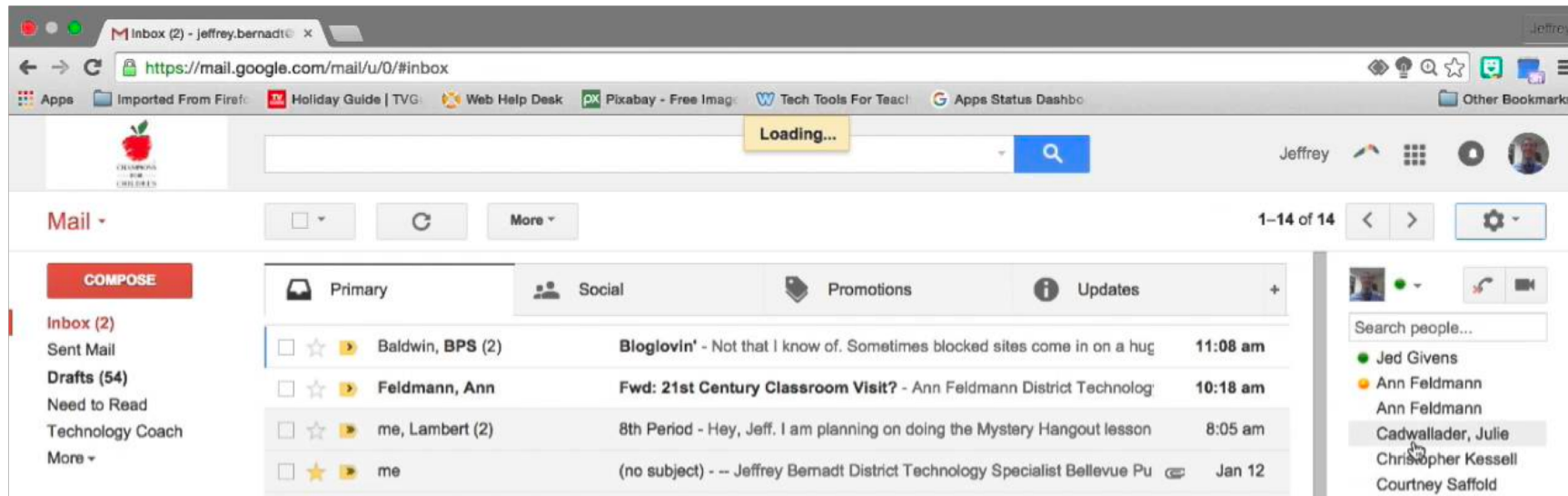
CRUD: Create, Read, Update Delete

Gmail is a database of emails

The screenshot shows a Gmail inbox interface. The browser address bar displays `https://mail.google.com/mail/u/0/#inbox`. The interface includes a search bar with a "Loading..." indicator, a navigation bar with "Mail" and "More" options, and a list of 14 emails. The left sidebar shows folders like "Inbox (2)", "Sent Mail", "Drafts (54)", and "Need to Read". The right sidebar shows a "Search people..." dropdown menu with a list of contacts, including "Jed Givens", "Ann Feldmann", "Ann Feldmann", "Cadwallader, Julie", "Christopher Kessell", "Courtney Saffold", "Jeanette Carlson", "Johnson, Stephanie", "Kelly Bernadt", "Loomis, Phillip", "Robert Mason", "Shannon Gier", "Todd Tripple", and "Toledo, Julian (Delor...)".

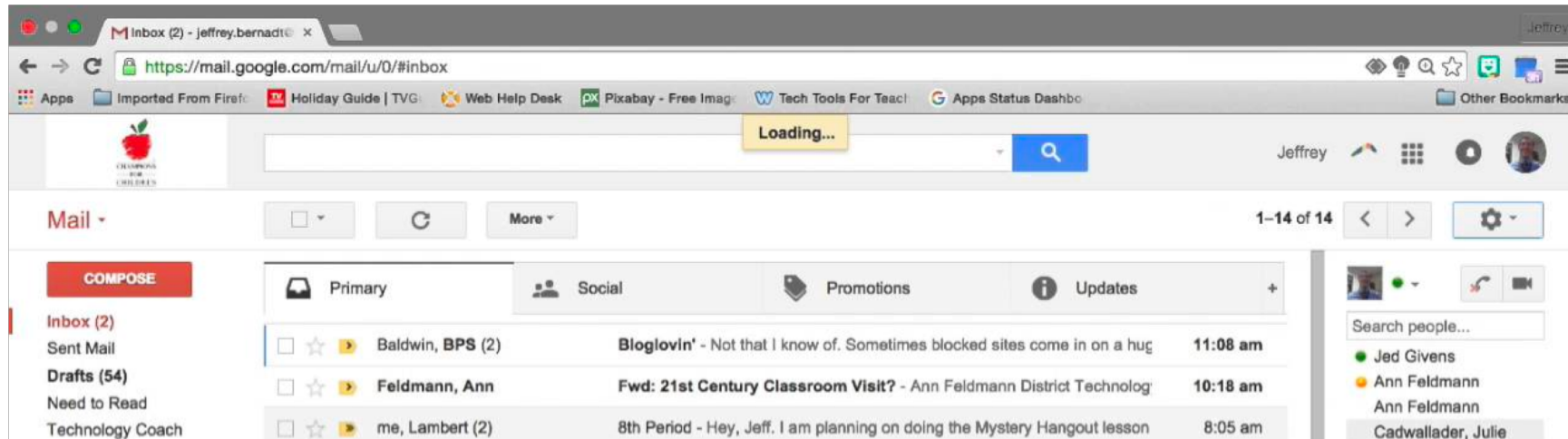
Sender	Subject	Time
Baldwin, BPS (2)	Bloglovin' - Not that I know of. Sometimes blocked sites come in on a hug	11:08 am
Feldmann, Ann	Fwd: 21st Century Classroom Visit? - Ann Feldmann District Technolog	10:18 am
me, Lambert (2)	8th Period - Hey, Jeff. I am planning on doing the Mystery Hangout lesson	8:05 am
me	(no subject) -- Jeffrey Bernadt District Technology Specialist Bellevue Pu	Jan 12
me, Braasch, Klamm (3)	Visitation & Observation Request - Good morning! The second semester is	Jan 12
me, Cox (2)	Bri Cox - Coaching Doc - Invitation to edit - Jeff, I finally was able to read a	Jan 12
Tripple, Todd	3D Printer - Hello Amy, I received some information from a 3D printing exp	Jan 11
donotreply	Education Preview Build Notice - AppleSeed Build Notice Education Pre	Jan 11
Ann Feldmann	Fwd: [New post] What "Innovative Leadership" Looks Like - A good read! :	Jan 11
me, Campbell (7)	Khan Academy Issues - It kept repeating that "changed password 7 month	Jan 8
Toelle, me (3)	6 Word Stories - Hey Jeff! We just returned from lunch, but still have quite	Jan 8
me, Evon (4)	Request to Visit on Thursday AM - Hi Jeff, Happy New Year! We would lov	Jan 6
Jeffrey Bernadt	Shared from Twitter: What teachers need to know about multicultural educ	12/23/15

What information is stored for each email?



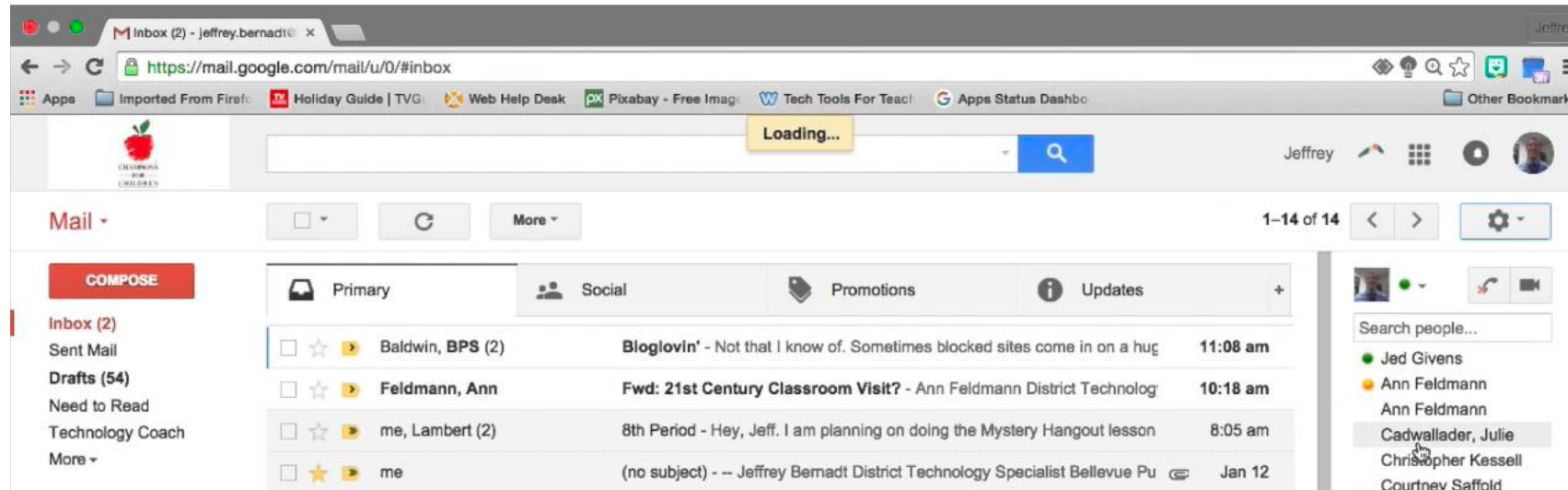
ID	From	To	Subject	Body	Time
1	Baldwin	Jeffrey	Blogloving'	Not that I know of...	158904993585835
2	Ann Feldman	Jeffrey	Fwd: Classroom visit?	Ann Feldman District Technology	158904993585923
...					

How do we store multiple users' data?



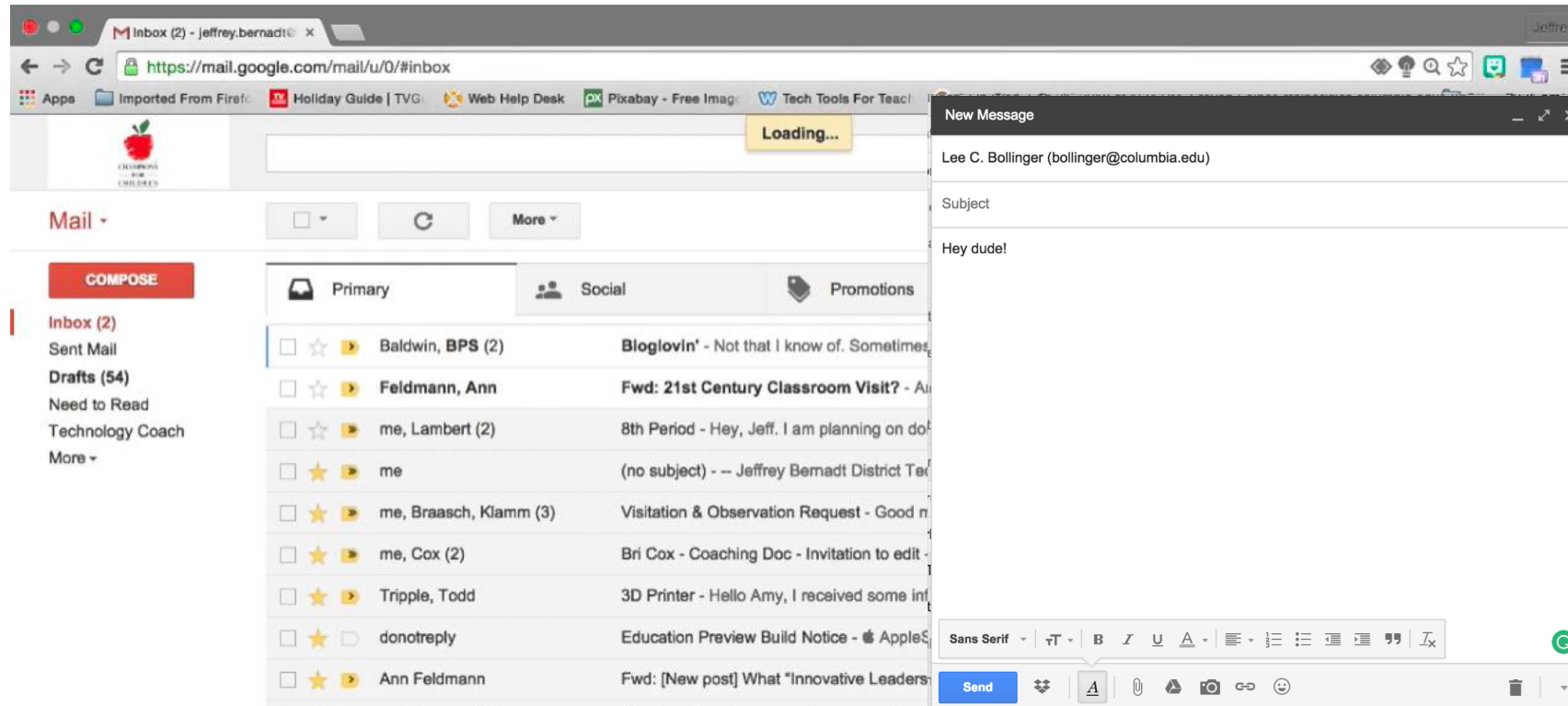
ID	From	To	Subject	Body	Time
1	Baldwin	Jeffrey	Bloglovin'	Not that I know of...	158904993585835
2	Ann Feldman	Jeffrey	Fwd: Classroom visit?	Ann Feldman District Technology	158904993585923
3	Lydia Chilton	Lee Bollinger	Bowling tuesday	Hey dude! Donnie and I were thinking of going bowling...	158904993443772
...					

Most websites allow users to: Create, Read, Update, and Delete Data



ID	From	To	Subject	Body	Time
1	Baldwin	Jeffrey	Blogloving'	Not that I know of...	158904993585835
2	Ann Feldman	Jeffrey	Fwd: Classroom visit?	Ann Feldman District Technology	158904993585923
3	Lydia Chilton	Lee Bollinger	Bowling tuesday	Hey dude! Donnie and I were thinking of going bowling...	158904993443772

CREATE: How do users create data in GMail?

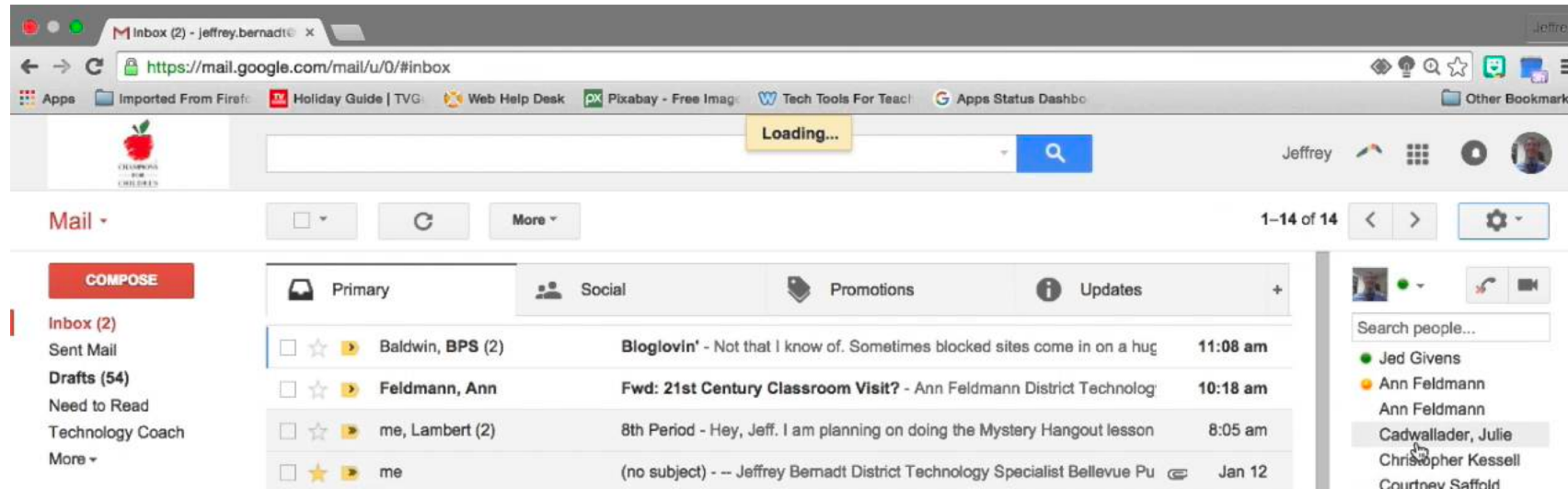


INSERT INTO emails (To, From, Subject, Body, time)

VALUES ("Lee Bollinger", "Jeffrey", "Bowling Tuesday", "wanna go?", NOW)

READ: How do users read data in GMail?

How do they see different portions of the database?

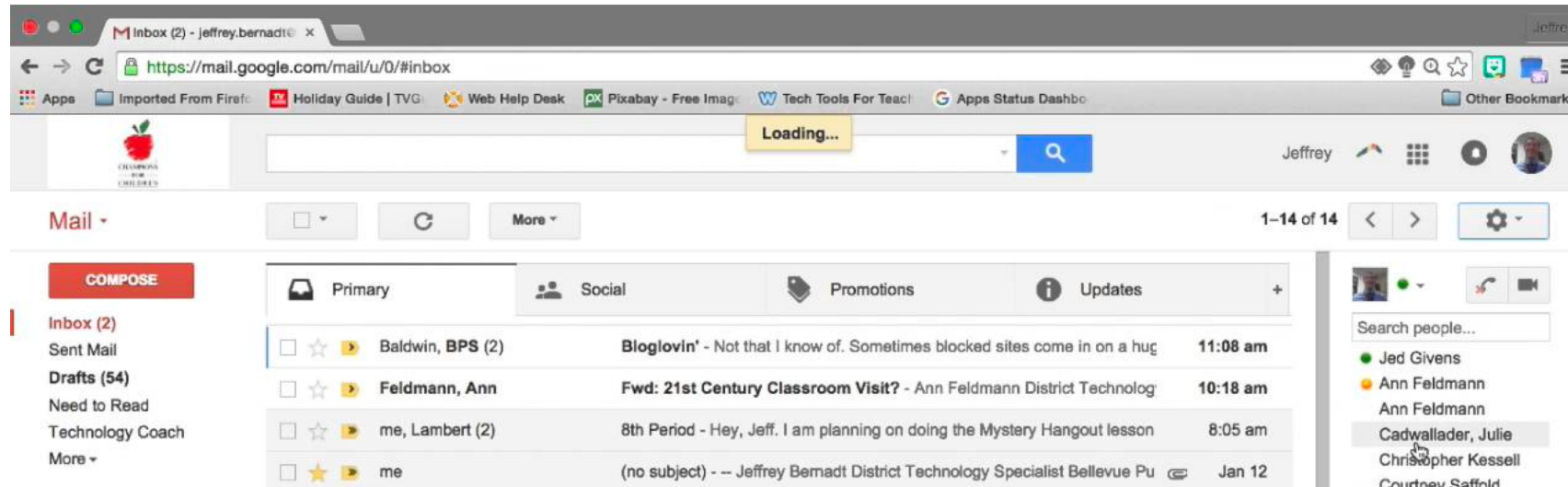


Select * FROM emails
WHERE (to = "Jeffrey")
ORDER BY time DESCENDING
LIMIT 30

WHY NOT THIS?
Select FROM emails WHERE
(to = "Jeffrey" OR from = "Jeffrey")

UPDATE: How do users update data in GMail?

What do they update? And how do they do it in the interface?



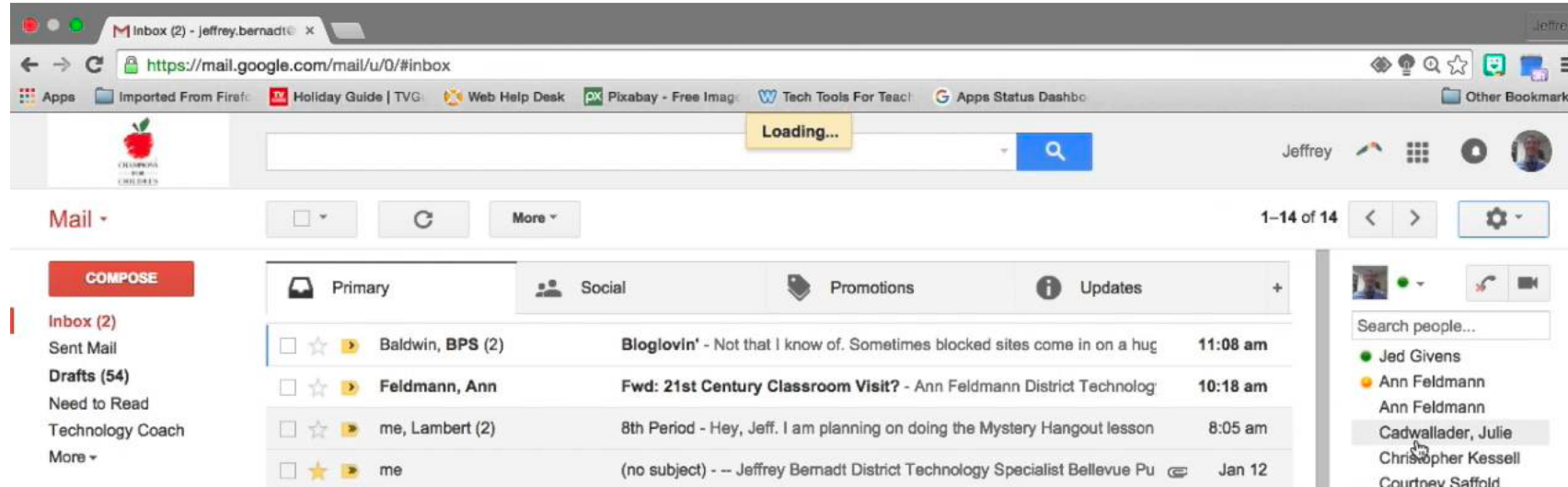
UPDATE email_table

SET starred = True

WHERE email_id="123456"

DELETE: How do users delete data in GMail?

First, what objects can be deleted in GMail?



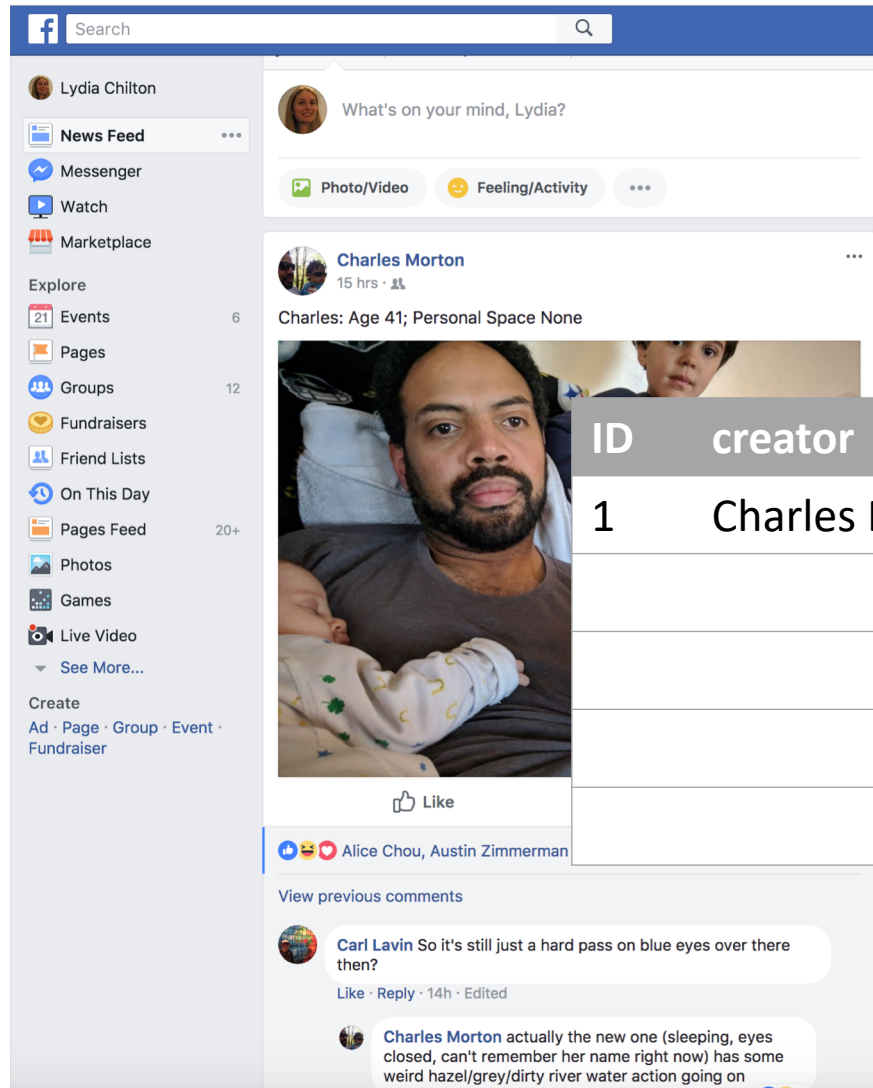
```
DELETE FROM email_drafts_table WHERE id="123456"
```

```
UPDATE email_table  
SET mark_as_deleted = True  
WHERE email_id="123456"
```

Facebook is a database of posts.

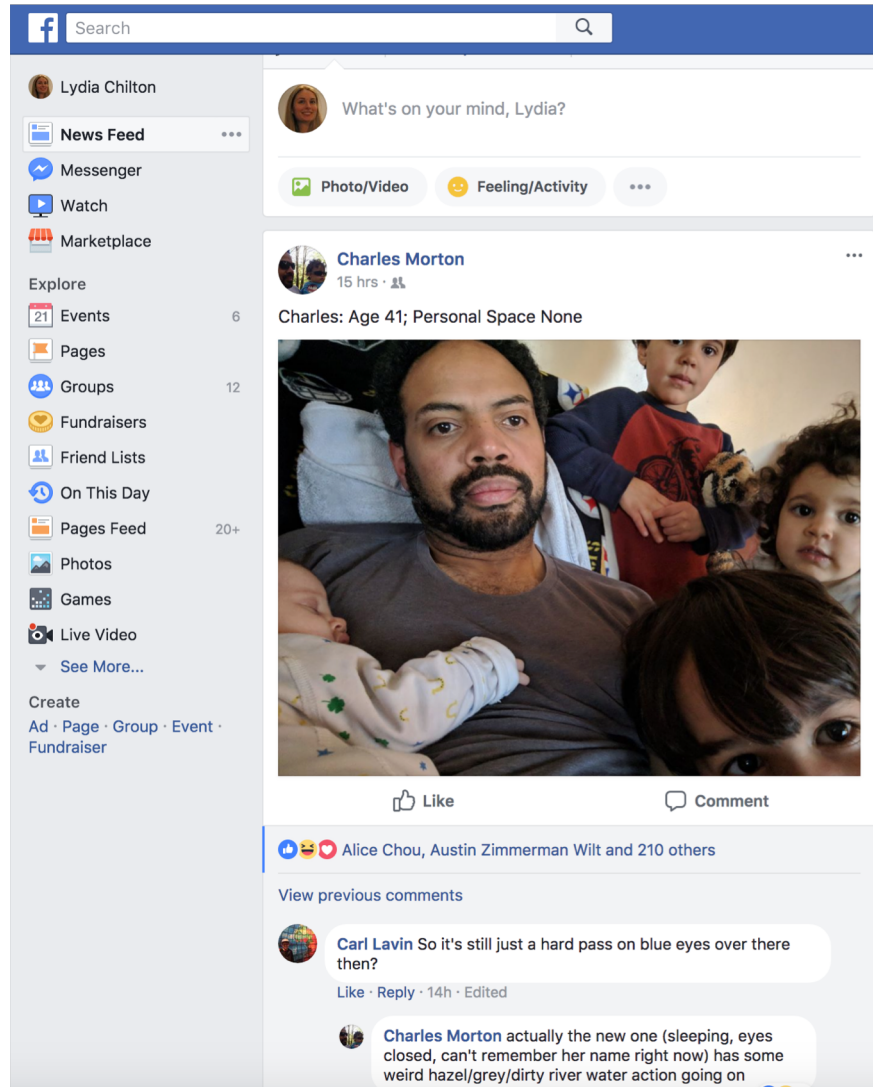


What fields are in the Facebook posts database?



ID	creator	text	Likes	Time
1	Charles Morton	Charles Age 41: Personal..	210	15890499

CREATE: How do users create data in Facebook?



INSERT INTO
posts (creator, text, likes, time)

VALUES
("Charles Morton",
"Charles: Age 41: Personal Space None "
0,
NOW())

READ: How do users read data in Facebook?

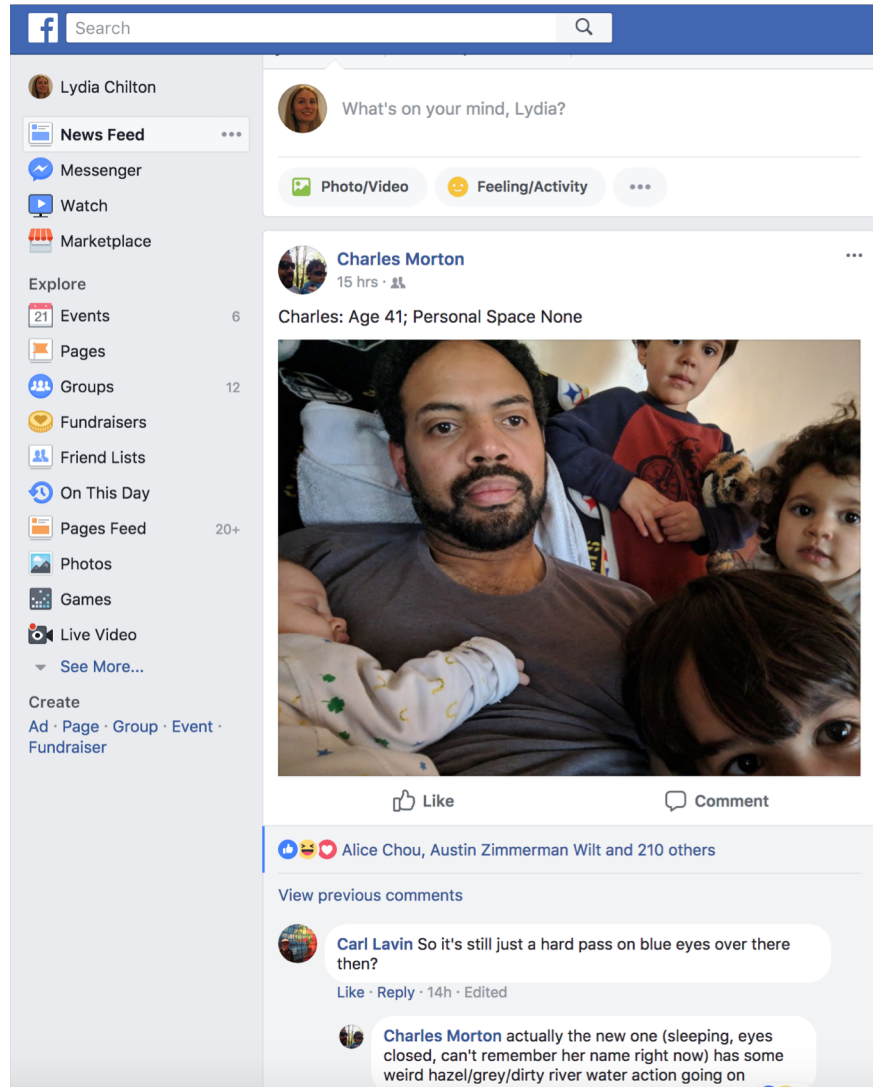


`my_friends =`

Select * FROM Friends WHERE friend1="Lydia Chilton"

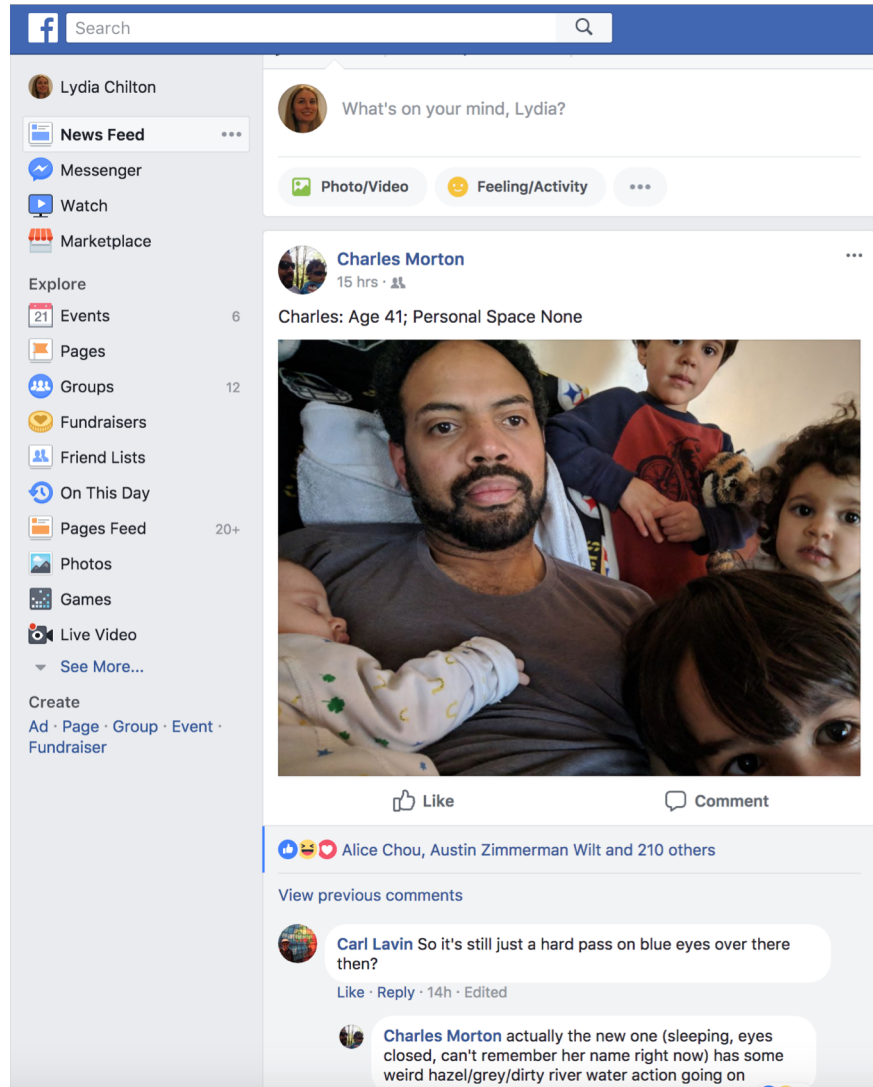
Select * FROM posts WHERE (creator in `my_friends`)
ORDER BY time DESCENDING
ORDER BY score ASCENDING

UPDATE: How do users update data in Facebook?



UPDATE posts
INCREMENT likes
WHERE post_id = "123345"

DELETE: How do users delete data in Facebook?

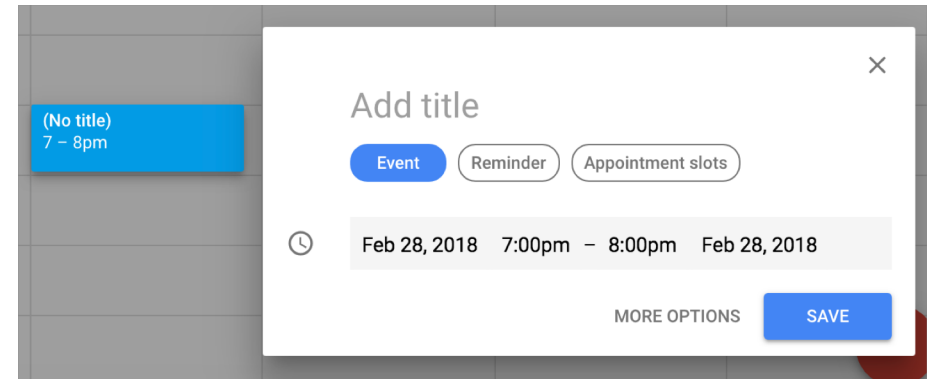
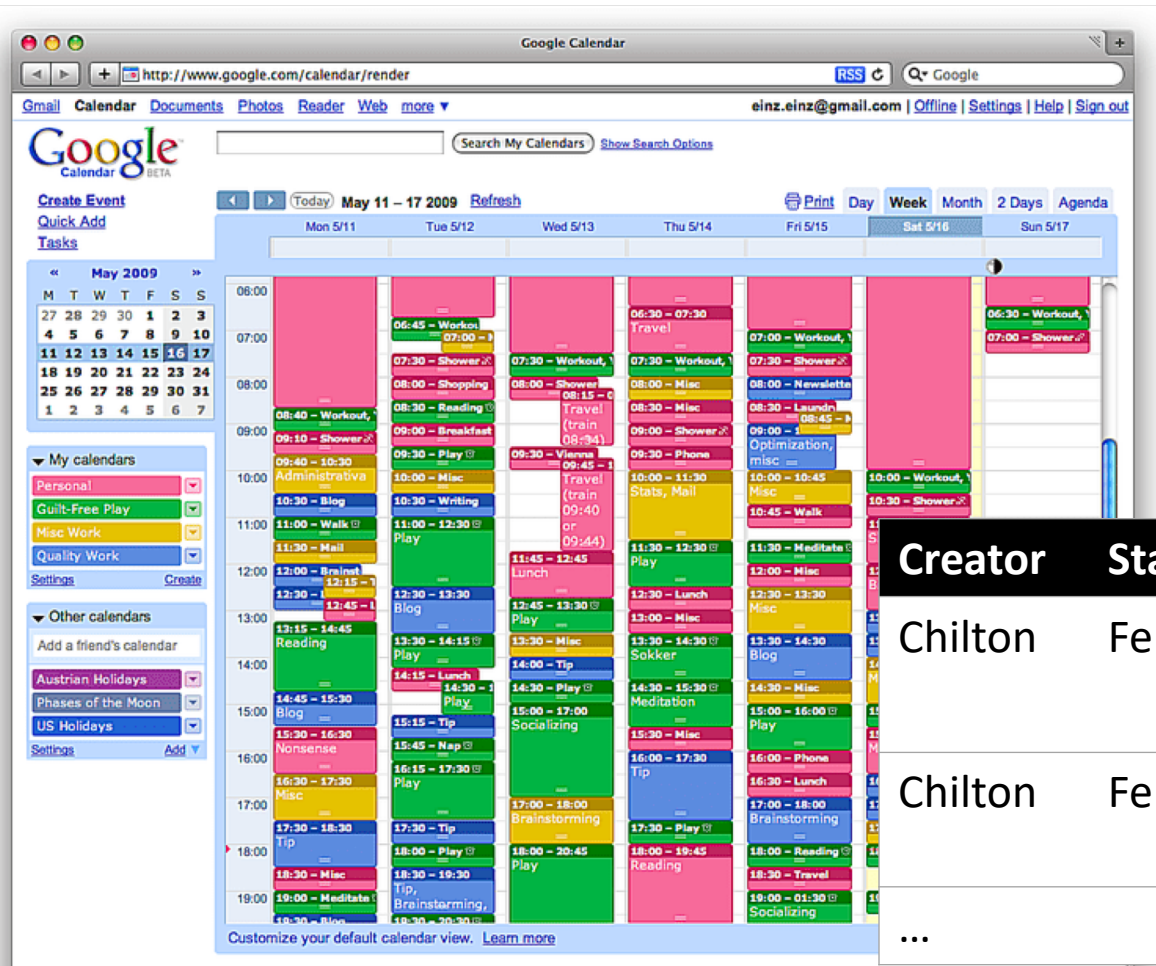


DELETE FROM posts
WHERE post_id = "123456"

What fields are in the Calendar events database?

The screenshot displays the Google Calendar interface in a weekly view for May 2009. The main area shows a grid of events from 08:00 to 19:00 across the days of the week (Monday to Sunday). Each event is represented by a colored block with a title and time range. For example, on Monday, there are events like 'Workout' (06:45-07:00), 'Shower' (07:30-08:00), 'Shopping' (08:00-08:30), 'Reading' (08:30-09:00), 'Breakfast' (09:00-09:30), 'Play' (09:30-10:00), 'Administrativa' (10:00-10:30), 'Blog' (10:30-11:00), 'Walk' (11:00-11:30), 'Mail' (11:30-12:00), 'Brainst' (12:00-12:30), 'Tip' (12:30-12:45), 'Reading' (13:15-14:45), 'Blog' (14:45-15:30), 'Nonsense' (15:30-16:30), 'Misc' (16:30-17:30), 'Tip' (17:30-18:30), and 'Misc' (18:30-19:30). On Tuesday, events include 'Workout' (06:45-07:00), 'Shower' (07:30-08:00), 'Reading' (08:30-09:00), 'Play' (09:30-10:00), 'Misc' (10:00-10:30), 'Writing' (10:30-11:00), 'Play' (11:00-12:30), 'Blog' (12:30-13:30), 'Play' (13:30-14:15), 'Lunch' (14:15-14:30), 'Play' (14:30-15:30), 'Tip' (15:15-16:30), 'Nap' (15:45-16:30), 'Play' (16:15-17:30), 'Tip' (17:30-18:00), 'Play' (18:00-20:45), and 'Brainstorming' (18:30-19:30). On Wednesday, events include 'Workout' (07:30-08:00), 'Shower' (08:15-08:45), 'Travel (train)' (08:45-09:44), 'Vienna' (09:45-10:45), 'Travel (train)' (10:45-11:30), 'Lunch' (11:45-12:45), 'Misc' (12:45-13:30), 'Tip' (14:00-14:30), 'Play' (14:30-15:30), 'Socializing' (15:00-17:00), 'Brainstorming' (17:00-18:00), and 'Play' (18:00-20:45). On Thursday, events include 'Travel' (06:30-07:30), 'Workout' (07:30-08:00), 'Misc' (08:00-08:30), 'Shower' (08:30-09:00), 'Vienna' (09:30-10:00), 'Travel (train)' (10:00-11:30), 'Lunch' (11:30-12:30), 'Lunch' (12:30-13:00), 'Soccer' (13:30-14:30), 'Meditation' (14:30-15:30), 'Misc' (15:30-17:00), 'Tip' (16:00-17:30), 'Play' (17:30-18:00), and 'Reading' (18:00-19:45). On Friday, events include 'Workout' (07:00-08:00), 'Shower' (07:30-08:00), 'Newlette' (08:00-08:30), 'Laundr' (08:30-08:45), 'Optimization, misc' (08:45-09:00), 'Misc' (10:00-10:45), 'Walk' (10:45-11:00), 'Meditate' (11:30-12:00), 'Misc' (12:00-12:30), 'Blog' (13:30-14:30), 'Misc' (14:30-15:00), 'Play' (15:00-16:00), 'Phone' (16:00-16:30), 'Lunch' (16:30-17:00), 'Review' (17:00-18:00), 'Brainstorming' (17:30-18:00), 'Reading' (18:00-19:00), and 'Socializing' (19:00-01:30). On Saturday, events include 'Workout' (06:30-07:00), 'Shower' (07:00-07:30), 'Workout' (10:00-10:30), 'Shower' (10:30-11:00), 'Shopping' (11:00-12:00), 'Breakfast' (12:00-13:00), 'Blog' (13:00-13:30), 'Brainstorm' (13:30-14:00), 'Misc, mail' (14:00-15:00), 'Meditation' (15:00-16:00), 'Misc' (15:30-16:30), and 'Browse P' (19:00-19:30). On Sunday, there are no events shown. The interface includes a search bar, navigation tabs (Day, Week, Month, 2 Days, Agenda), and a sidebar with 'My calendars' and 'Other calendars' sections.

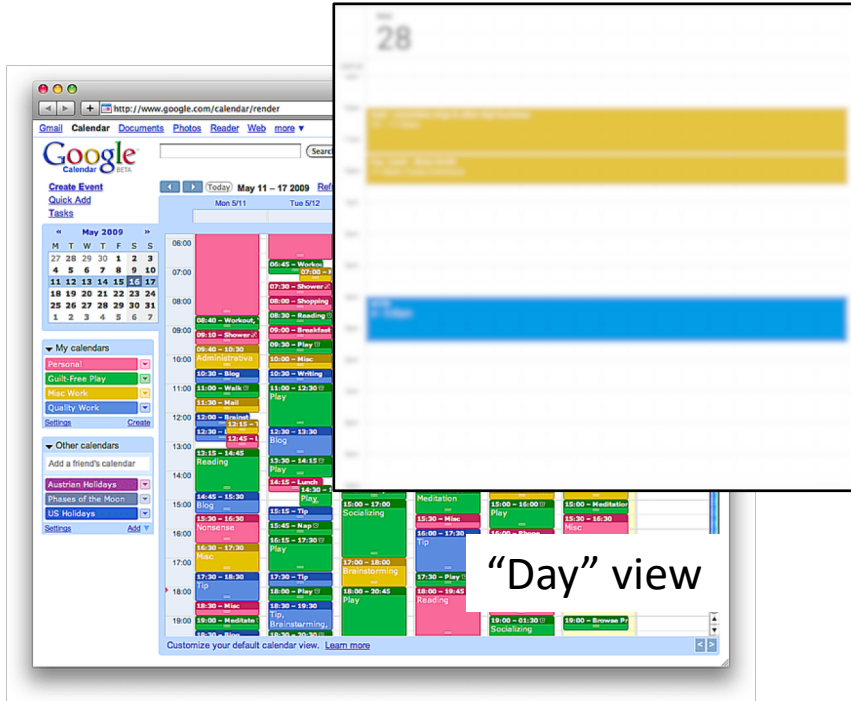
CREATE: How do users create data in Calendar?



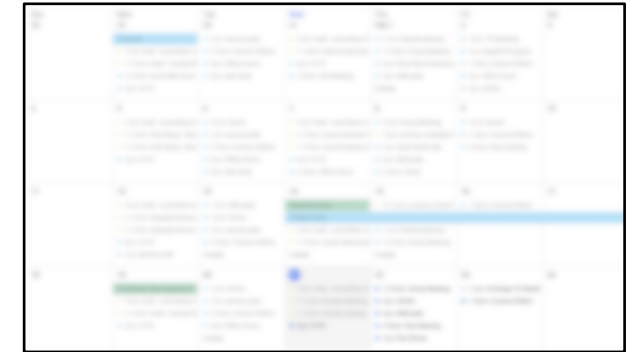
Creator	Start date	End Date	Title
Chilton	Feb 28, 7pm	Feb 28, 8pm	Dinner with Lee
Chilton	Feb 14, 4pm	Feb 17, 12pm	National Academy of Sciences event
...			

READ: How do users read data in Calendar?

How do they see different portions of the database?



“Week” view

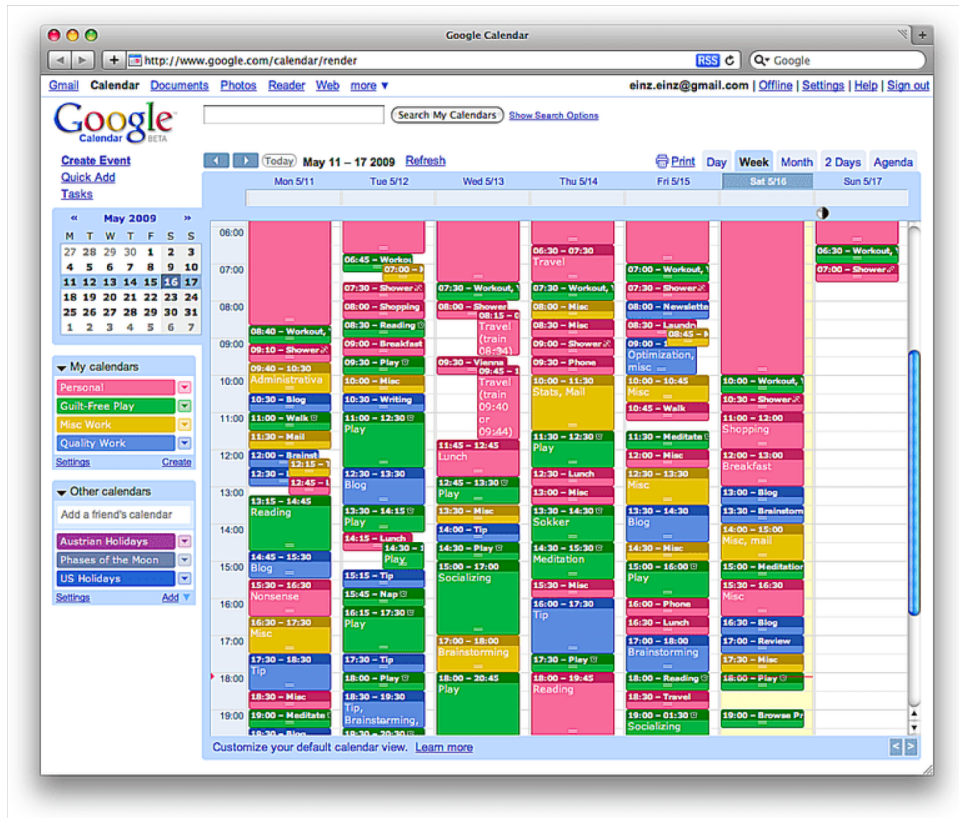


“Month” view

Select * FROM event WHERE (creator = Chilton),
(Start_date >Today AND
End_date < Tomorrow) OR...

Creator	Start date	End Date	Title
Chilton	Feb 28, 7pm	Feb 28, 8pm	Dinner with Lee
Chilton	Feb 14, 4pm	Feb 17, 12pm	National Academy of Sciences event

DELETE: How do users delete data in Calendar?



Selecting an event and clicking delete



CRUD: Operations for interacting with a database

Create


New Message

To

From Lydia Chilton <chilton@cs.columbia.edu> ▾

Subject

Hey dude!

 What's on your mind, Lydia?

Add title

(No title)
7 - 8pm

Event Reminder Appointment slots

Feb 28, 2018 7:00pm - 8:00pm Feb 28, 2018

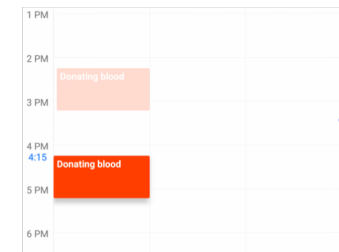
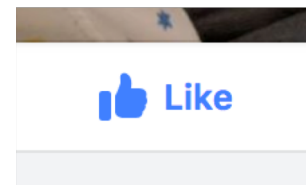
MORE OPTIONS

Read

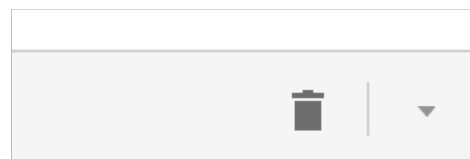
Baldwin, BPS (2)	Bioglovin' - Not that I know of. Sometimes b
Feldmann, Ann	Fwd: 21st Century Classroom Visit? - Ann
me, Lambert (2)	8th Period - Hey, Jeff. I am planning on doing
me	(no subject) - -- Jeffrey Bernadt District Techn



Update



Delete



Delete Post?

Are you sure you want to delete it?



Dynamically Generated Webpages

On IMDB, are there 100,000 static HTML pages sitting around?

IMDb Find Movies, TV shows, Celebrities and more... All

Movies, TV & Showtimes | Celebs, Events & Photos | News & Community | Watchlist

FULL CAST AND CREW | TRIVIA | USER REVIEWS | IMDbPro | MORE | SHARE

The Big Chill (1983) ★ 7.2 /10 28,073 Rate This

R | 1h 45min | Comedy, Drama | 30 September 1983 (USA)



02:02 | Trailer | 1 VIDEO | 76 IMAGES

Watch Now With Prime Video

WATCH NOW ON DISC

A group of seven former college friends gather for a weekend reunion at a South Carolina winter house after the funeral of one of their friends.

Director: Lawrence Kasdan
Writers: Lawrence Kasdan, Barbara Benedek
Stars: Tom Berenger, Glenn Close, Jeff Goldblum | See full cast & crew »

62 Metascore From metacritic.com | 186 user | 61 critic | 4,222 (↑ 509) Popularity

Nominated for 3 Oscars. Another 3 wins & 5 nominations. See more awards »



IMDb Find Movies, TV shows, Celebrities and more... All

Movies, TV & Showtimes | Celebs, Events & Photos | News & Community | Watchlist

FULL CAST AND CREW | TRIVIA | USER REVIEWS | IMDbPro | MORE | SHARE

The Big Lebowski (1998) ★ 8.2 /10 609,031 Rate This

R | 1h 57min | Comedy, Crime | 6 March 1998 (USA)



0:31 | Trailer | 9 VIDEOS | 141 IMAGES

Watch Now From \$2.99 (SD) on Prime Video

ON DISC

"The Dude" Lebowski, mistaken for a millionaire Lebowski, seeks restitution for his ruined rug and enlists his bowling buddies to help get it.

Directors: Joel Coen, Ethan Coen (uncredited)
Writers: Ethan Coen, Joel Coen
Stars: Jeff Bridges, John Goodman, Julianne Moore | See full cast & crew »

69 Metascore From metacritic.com | 1,075 user | 257 critic | 515 (↓ 32) Popularity

Top Rated Movies #167 | 4 wins & 17 nominations. See more awards »

IMDb Find Movies, TV shows, Celebrities and more... All

Movies, TV & Showtimes | Celebs, Events & Photos | News & Community | Watchlist

FULL CAST AND CREW | TRIVIA | USER REVIEWS | IMDbPro | MORE | SHARE

The Big Short (2015) ★ 7.8 /10 274,582 Rate This

R | 2h 10min | Biography, Comedy, Drama | 23 December 2015 (USA)



2:05 | Trailer | 39 VIDEOS | 128 IMAGES

Watch Now From \$2.99 (SD) on Prime Video

ON DISC

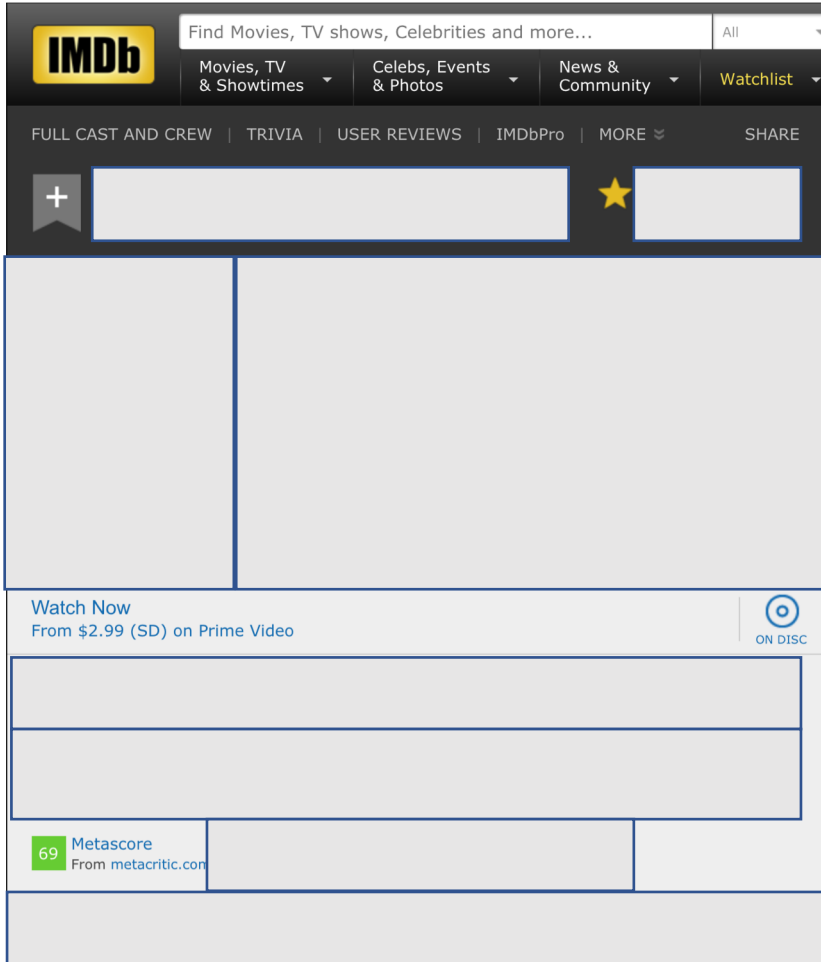
In 2006-7 a group of investors bet against the US mortgage market. In their research they discover how flawed and corrupt the market is.

Director: Adam McKay
Writers: Charles Randolph (screenplay), Adam McKay (screenplay) | 1 more credit »
Stars: Christian Bale, Steve Carell, Ryan Gosling | See full cast & crew »

81 Metascore From metacritic.com | 428 user | 454 critic | 434 (★ 47) Popularity

Won 1 Oscar. Another 37 wins & 79 nominations. See more awards »

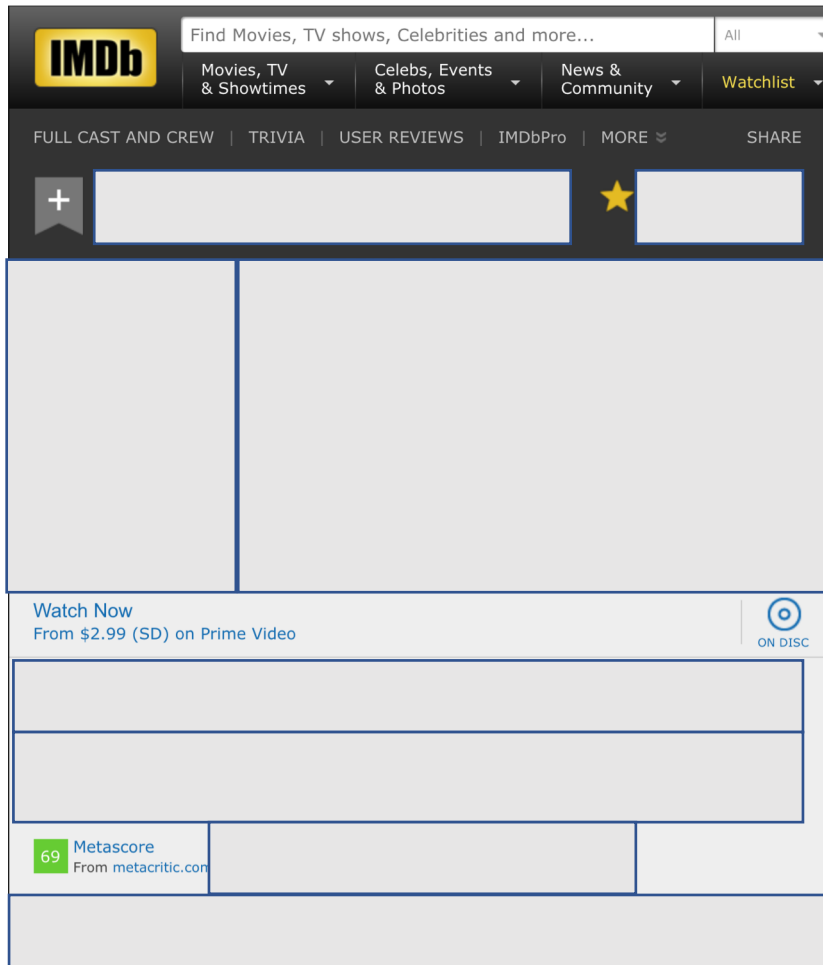
IMDB uses a template and a database...



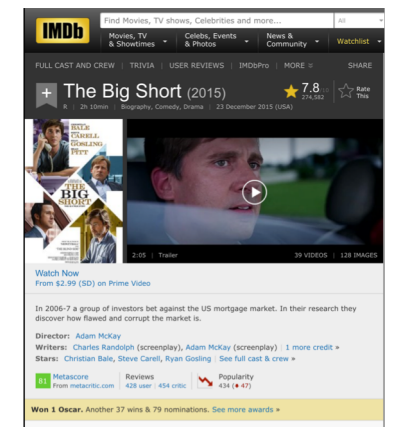
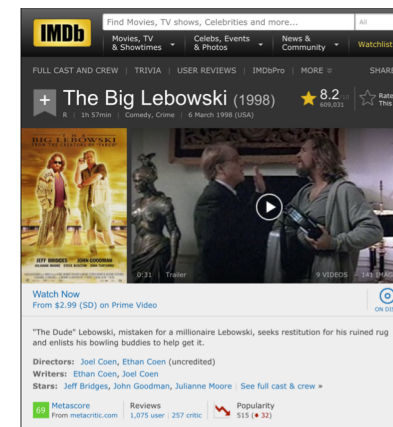
Title	Plot summary	poster	year
The Big Lebowski	"The dude" Lebowski, mistaken...	Lebowski.jpg	1998
The Big Short	In 2006-7 a group of investors...	Big_short.jpg	2015
The Big Chill	A group of 7 former roommates	Big_chill.jpg	1983

IMDB uses a template and a database...

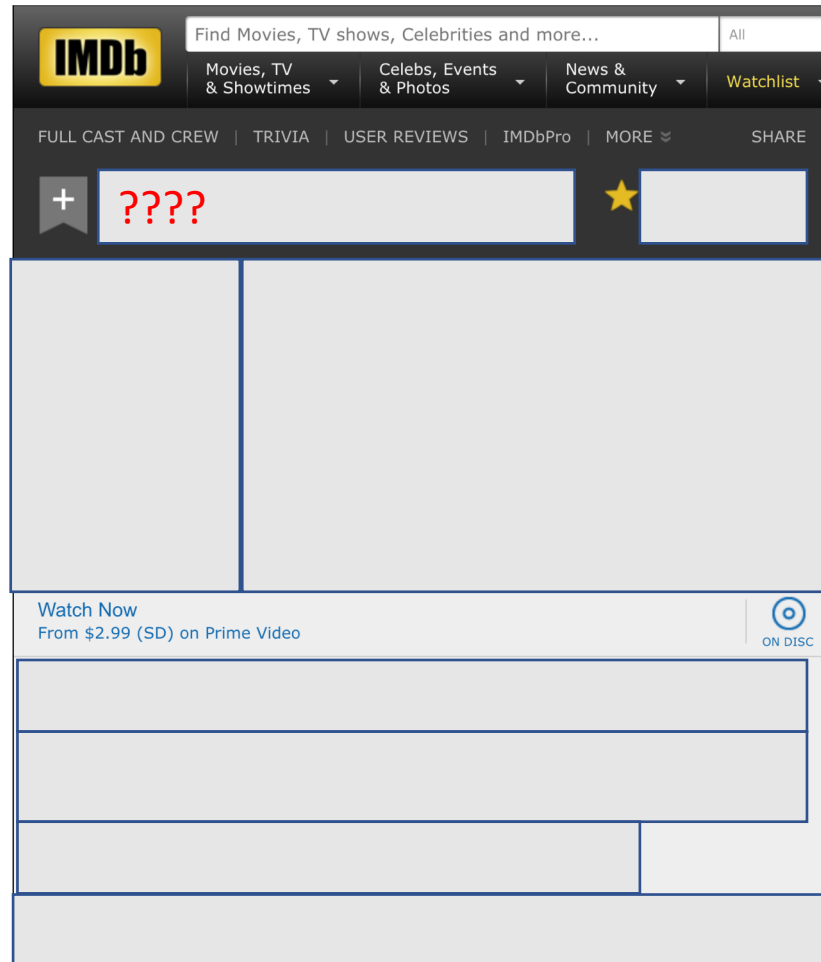
And fills in the data dynamically on pageload



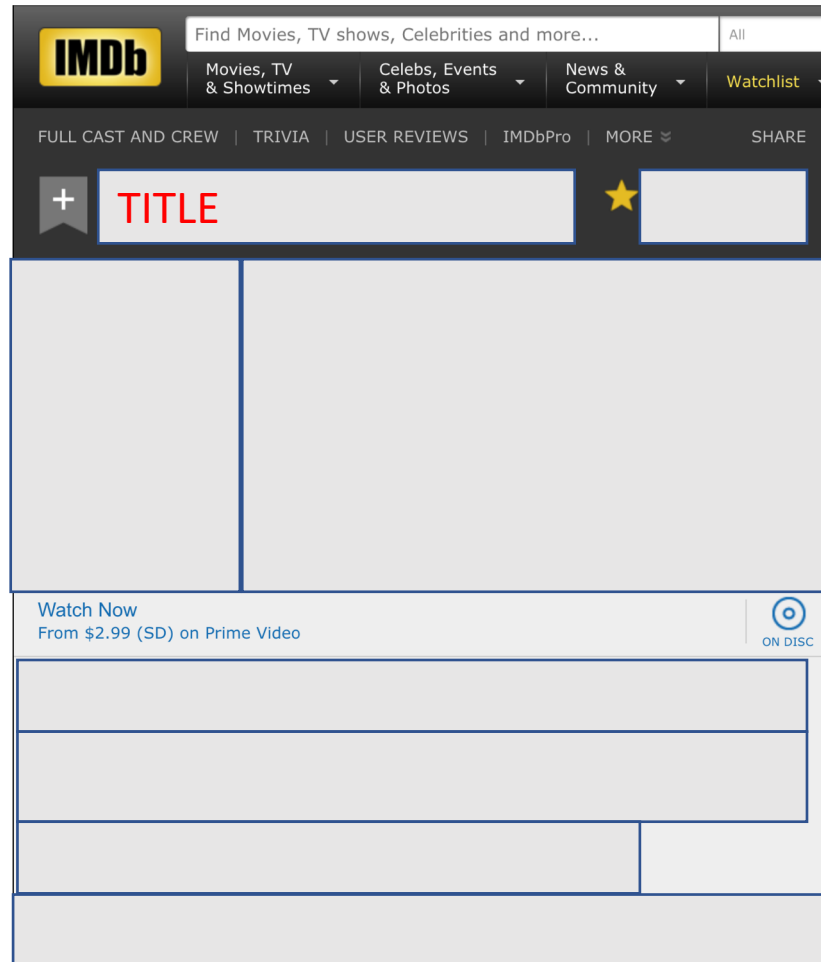
Title	Plot summary	poster	year
The Big Lebowski	"The dude" Lebowski, mistaken...	Lebowski.jpg	1998
The Big Short	In 2006-7 a group of investors...	Big_short.jpg	2015
The Big Chill	A group of 7 former roommates	Big_chill.jpg	1983



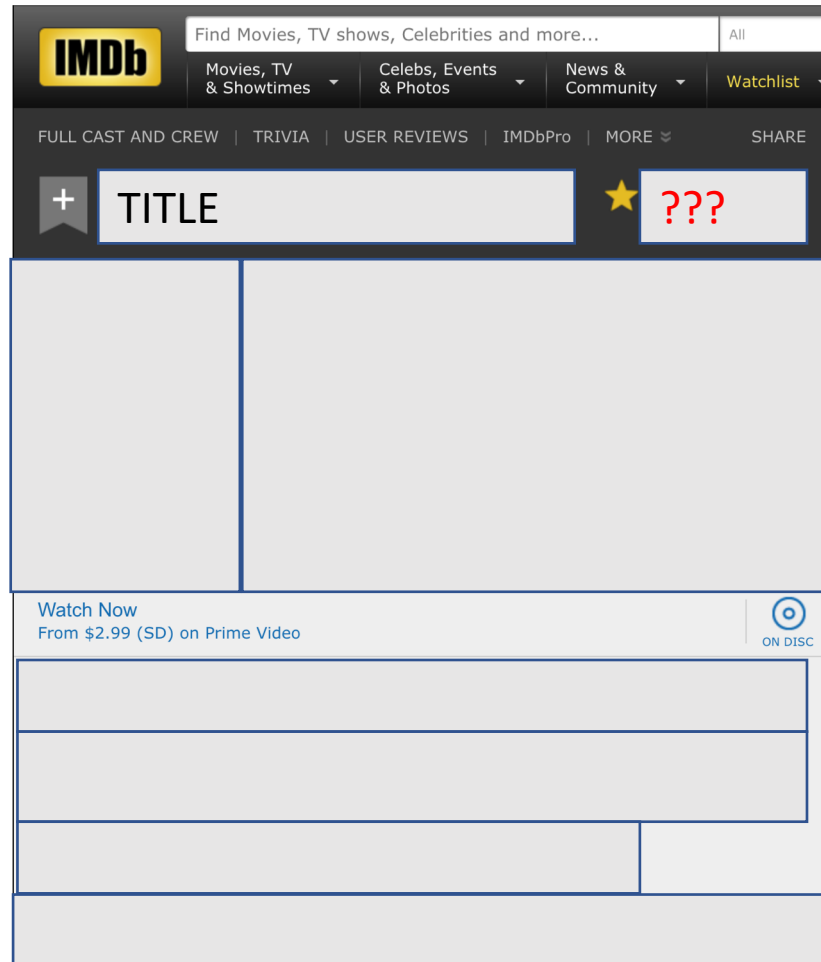
What goes in the template?



What goes in the template?



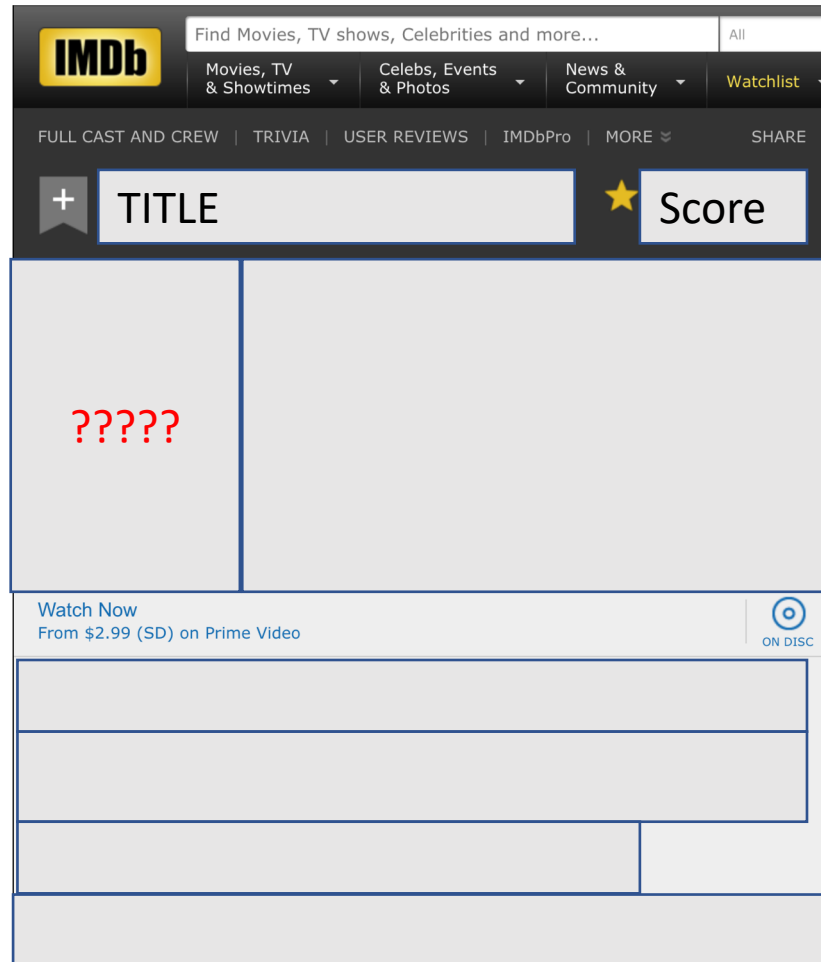
What goes in the template?



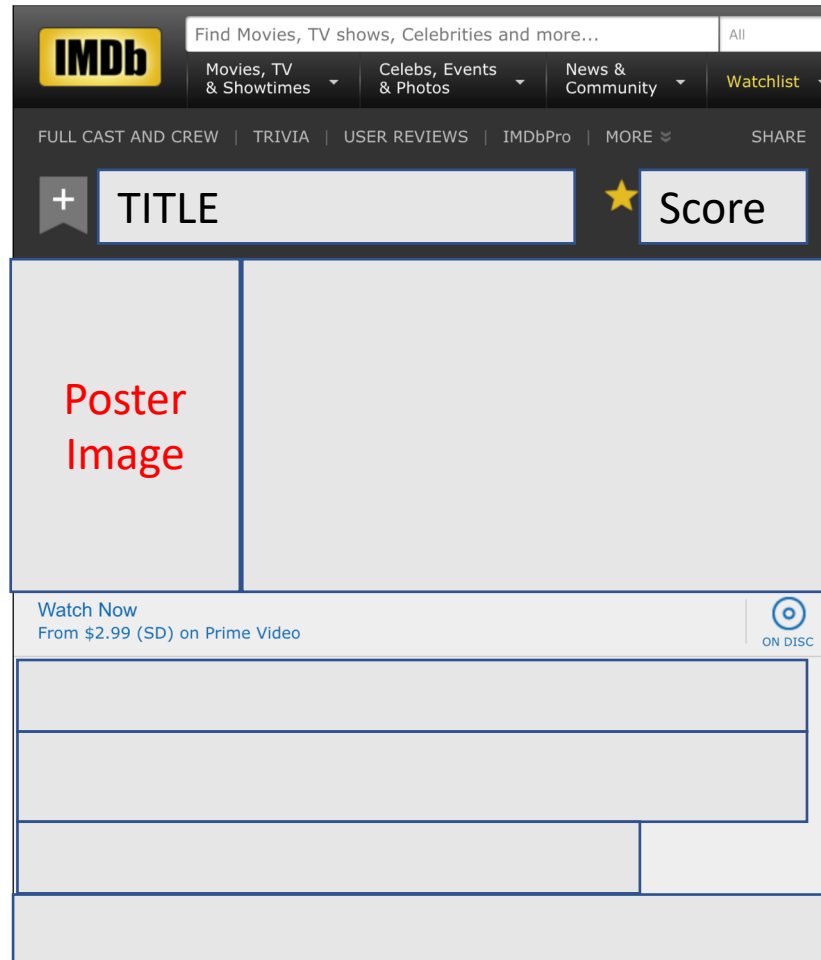
What goes in the template?



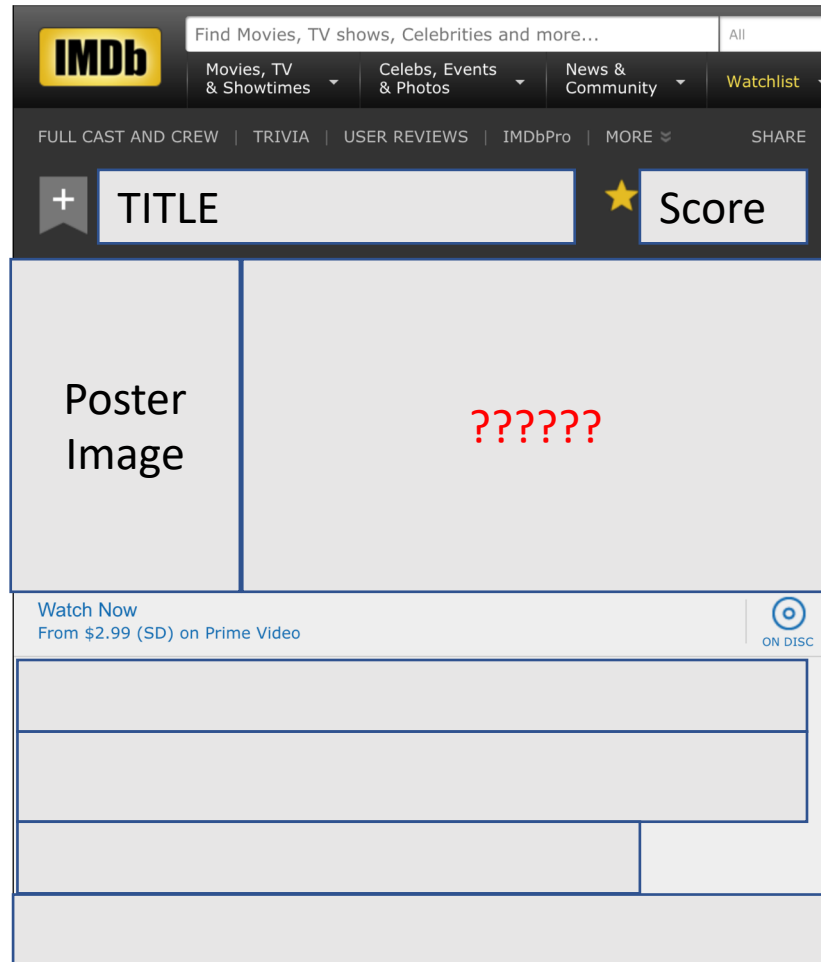
What goes in the template?



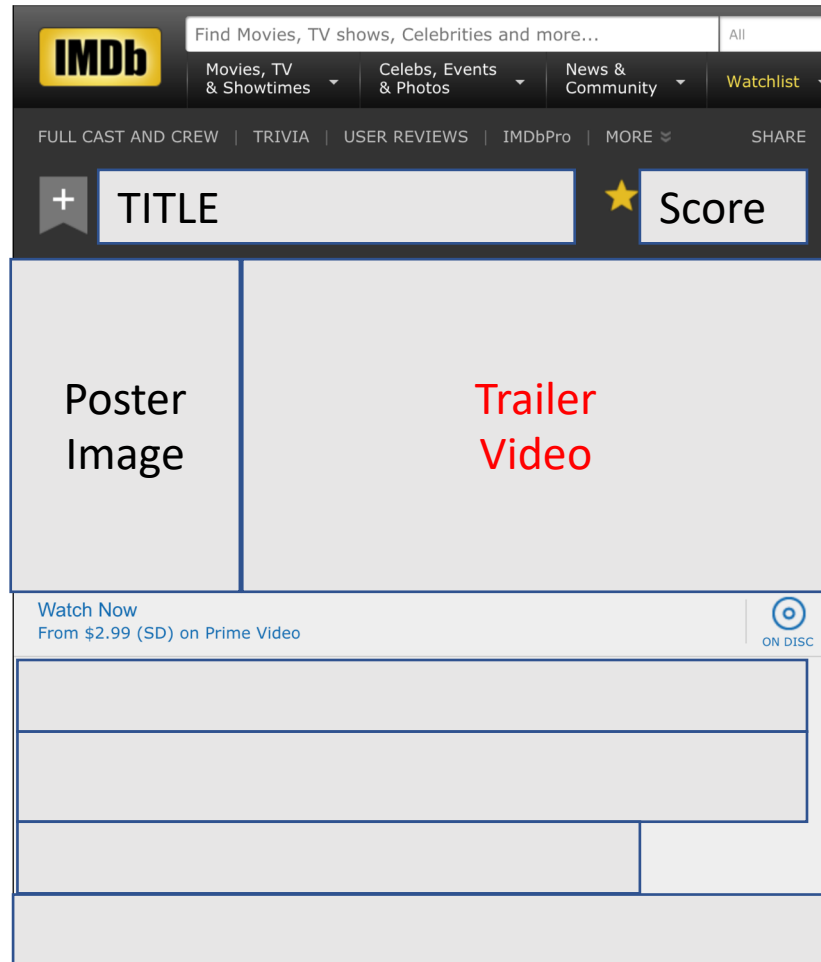
What goes in the template?



What goes in the template?



What goes in the template?



IMDb uses a template and dynamically fills the template from a database query

The screenshot displays the IMDb page for the movie "The Big Lebowski" (1998). At the top, there is a search bar and navigation tabs for "Movies, TV & Showtimes", "Celebs, Events & Photos", "News & Community", and "Watchlist". Below the navigation, there are links for "FULL CAST AND CREW", "TRIVIA", "USER REVIEWS", "IMDbPro", and "MORE". The movie title "The Big Lebowski (1998)" is prominently displayed, along with its rating of 8.2/10 and a "Rate This" button. The movie's genre is listed as "Comedy, Crime" and its release date as "6 March 1998 (USA)". A trailer player is embedded, showing a scene from the movie. Below the trailer, there is a "Watch Now" section with a price of "From \$2.99 (SD) on Prime Video" and a "ON DISC" button. The bottom of the page features several empty rectangular boxes, which are part of a template structure used to dynamically fill content from a database query.

Anyone remember the other categories?

The screenshot shows the IMDb page for the movie 'The Big Lebowski' (1998). At the top, there is a search bar with the text 'Find Movies, TV shows, Celebrities and more...' and a dropdown menu set to 'All'. Below the search bar are navigation tabs: 'Movies, TV & Showtimes', 'Celebs, Events & Photos', 'News & Community', and 'Watchlist'. A secondary navigation bar includes 'FULL CAST AND CREW', 'TRIVIA', 'USER REVIEWS', 'IMDbPro', 'MORE', and 'SHARE'. The main header for the movie displays the title '+ The Big Lebowski (1998)', a star rating of 8.2/10 based on 609,031 reviews, and a 'Rate This' button. Below this, it lists 'R | 1h 57min | Comedy, Crime | 6 March 1998 (USA)'. The central area features a movie poster on the left and a video player on the right showing a scene from the film. Below the video player, there is a 'Watch Now' section with the text 'From \$2.99 (SD) on Prime Video' and an 'ON DISC' button. The bottom portion of the page is filled with several empty rectangular boxes, likely representing redacted content or placeholder text.

Anyone remember the other categories?

IMDb Find Movies, TV shows, Celebrities and more... All

Movies, TV & Showtimes | Celebs, Events & Photos | News & Community | Watchlist

FULL CAST AND CREW | TRIVIA | USER REVIEWS | IMDbPro | MORE | SHARE

The Big Lebowski (1998) ★ 8.2¹⁰
609,031 Rate This

R | 1h 57min | Comedy, Crime | 6 March 1998 (USA)

BIG LEBOWSKI
FROM THE CREATORS OF "FARGO"

JEFF BRIDGES JOHN GOODMAN
JULIANNE MOORE STEVE BUSCEMI JOHN TURTURRO

0:31 Trailer 9 VIDEOS 141 IMAGES

Watch Now
From \$2.99 (SD) on Prime Video ON DISC

Plot summary

Main creatives

Reviews

Awards

Anyone remember the other categories?



IMDb Find Movies, TV shows, Celebrities and more... All

Movies, TV & Showtimes | Celebs, Events & Photos | News & Community | Watchlist

FULL CAST AND CREW | TRIVIA | USER REVIEWS | IMDbPro | MORE | SHARE

The Big Lebowski (1998) ★ 8.2_{609,031} ☆ Rate This

R | 1h 57min | Comedy, Crime | 6 March 1998 (USA)

Watch Now
From \$2.99 (SD) on Prime Video ON DISC

"The Dude" Lebowski, mistaken for a millionaire Lebowski, seeks restitution for his ruined rug and enlists his bowling buddies to help get it.

Directors: [Joel Coen](#), [Ethan Coen](#) (uncredited)
Writers: [Ethan Coen](#), [Joel Coen](#)
Stars: [Jeff Bridges](#), [John Goodman](#), [Julianne Moore](#) | [See full cast & crew »](#)

69 Metascore From [metacritic.com](#) | **Reviews** 1,075 user | 257 critic | **Popularity** 515 (▲ 32)

Top Rated Movies #167 | 4 wins & 17 nominations. [See more awards »](#)

IMDb Template

The screenshot shows the IMDb website interface with a template for a movie page. The top navigation bar includes the IMDb logo, a search bar, and menu items like 'Movies, TV & Showtimes', 'Celebs, Events & Photos', 'News & Community', and 'Watchlist'. Below the navigation bar, there are links for 'FULL CAST AND CREW', 'TRIVIA', 'USER REVIEWS', 'IMDbPro', 'MORE', and 'SHARE'. The main content area features a title placeholder '>{{TITLE}}' with a plus sign icon and a score placeholder '>{{Score}}' with a star icon. Below this, there are two large boxes containing HTML code for an image and a video trailer. The image code is '' and the video code is '<video src= \"{{Trailer Video}}>'. Below these boxes, there is a 'Watch Now' section with a price 'From \$2.99 (SD) on Prime Video' and an 'ON DISC' icon. The bottom section contains several rows of placeholder text: '>{{Plot summary}}', '>{{Main creatives}}', '>{{Reviews}}', and '>{{Awards}}'.

IMDb

Find Movies, TV shows, Celebrities and more... All

Movies, TV & Showtimes Celebs, Events & Photos News & Community Watchlist

FULL CAST AND CREW TRIVIA USER REVIEWS IMDbPro MORE SHARE

+ {{TITLE}} ★ {{Score}}

<video src= \"{{Trailer Video}}>

Watch Now
From \$2.99 (SD) on Prime Video ON DISC

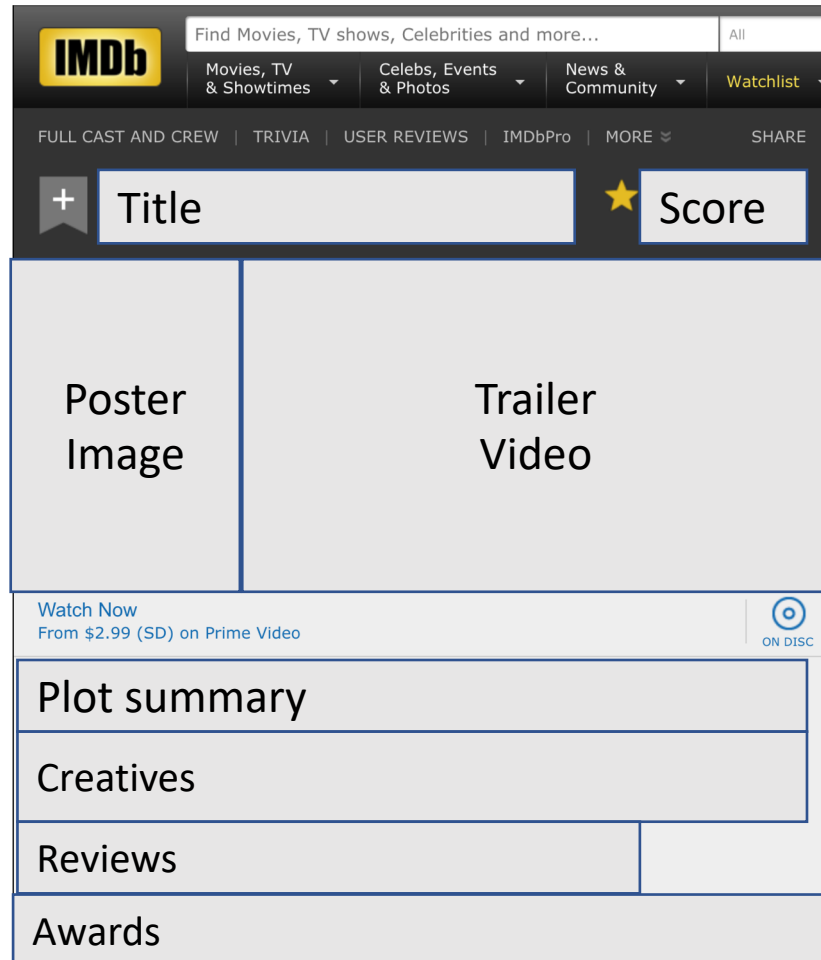
{{Plot summary}}

{{Main creatives}}

{{Reviews}}

{{Awards}}

Templates are standardizations. What can go wrong?



Templates are standardizations. What can go wrong?

The screenshot shows the IMDb page for the movie "The Big Short" (2015). The page layout is consistent with the IMDb template, but the poster image area is missing, represented by a large grey rectangle. The metadata below the title is visible:

Director: Adam McKay
Writers: Charles Randolph (screenplay), Adam McKay (screenplay) | 1 more credit »
Stars: Christian Bale, Steve Carell, Ryan Gosling | See full cast & crew »

The screenshot shows the IMDb page for the movie "The Big Lebowski" (1998). The page layout is consistent with the IMDb template, but the poster image area is missing, represented by a large grey rectangle. The title "The Big Lebowski" is redacted with a grey box containing red question marks "????????". The metadata below the title is visible:

Stars: Jeff Bridges, John Goodman, Julianne Moore | See full cast & crew »

Templates are standardizations. What can go wrong?

The screenshot shows the IMDb page for the movie "The Big Short" (2015). The page layout is partially obscured by a grey template overlay with blue borders. The visible text includes the IMDb logo, a search bar, navigation tabs, and movie details: "The Big Short (2015)", "R", "2h 10min", "Biography, Comedy, Drama", and "23 December 2015 (USA)". Below the title, there are sections for "Director: Adam McKay", "Writers: Charles Randolph (screenplay), Adam McKay (screenplay) | 1 more credit >>", and "Stars: Christian Bale, Steve Carell, Ryan Gosling | See full cast & crew >>".

The screenshot shows the IMDb page for the movie "The Big Lebowski" (1998). The page layout is partially obscured by a grey template overlay with blue borders. The visible text includes the IMDb logo, a search bar, navigation tabs, and movie details: "The Big Lebowski (1998)", "R", "1h 57min", "Comedy, Crime", and "6 March 1998 (USA)". Below the title, there are sections for "Directors: Joel Coen, Ethan Coen (uncredited)", "Writers: Ethan Coen, Joel Coen", and "Stars: Jeff Bridges, John Goodman, Julianne Moore | See full cast & crew >>".

Standardization is hard. Expect to **iterate** on your templates

IMDb Find Movies, TV shows, Celebrities and more... All

Movies, TV & Showtimes | Celebs, Events & Photos | News & Community | Watchlist

FULL CAST AND CREW | TRIVIA | USER REVIEWS | IMDbPro | MORE | SHARE

The Big Chill (1983) ★ 7.2 ¹⁰/_{28,073} ☆ Rate This

R | 1h 45min | Comedy, Drama | 30 September 1983 (USA)



Watch Now With Prime Video

A group of seven former college friends gather for a weekend reunion at a South Carolina winter house after the funeral of one of their friends.

Director: [Lawrence Kasdan](#)
Writers: [Lawrence Kasdan](#), [Barbara Benedek](#)
Stars: [Tom Berenger](#), [Glenn Close](#), [Jeff Goldblum](#) | [See full cast & crew](#) »

62 Metascore From [metacritic.com](#) | 186 user | 61 critic | Popularity 4,222 (▲ 509)

Nominated for 3 Oscars. Another 3 wins & 5 nominations. [See more awards](#) »



IMDb Find Movies, TV shows, Celebrities and more... All

Movies, TV & Showtimes | Celebs, Events & Photos | News & Community | Watchlist

FULL CAST AND CREW | TRIVIA | USER REVIEWS | IMDbPro | MORE | SHARE

The Big Lebowski (1998) ★ 8.2 ¹⁰/_{609,031} ☆ Rate This

R | 1h 57min | Comedy, Crime | 6 March 1998 (USA)



Watch Now From \$2.99 (SD) on Prime Video

"The Dude" Lebowski, mistaken for a millionaire Lebowski, seeks restitution for his ruined rug and enlists his bowling buddies to help get it.

Directors: [Joel Coen](#), [Ethan Coen](#) (uncredited)
Writers: [Ethan Coen](#), [Joel Coen](#)
Stars: [Jeff Bridges](#), [John Goodman](#), [Julianne Moore](#) | [See full cast & crew](#) »

69 Metascore From [metacritic.com](#) | 1,075 user | 257 critic | Popularity 515 (▲ 32)

Top Rated Movies #167 | 4 wins & 17 nominations. [See more awards](#) »



IMDb Find Movies, TV shows, Celebrities and more... All

Movies, TV & Showtimes | Celebs, Events & Photos | News & Community | Watchlist

FULL CAST AND CREW | TRIVIA | USER REVIEWS | IMDbPro | MORE | SHARE

The Big Short (2015) ★ 7.8 ¹⁰/_{274,582} ☆ Rate This

R | 2h 10min | Biography, Comedy, Drama | 23 December 2015 (USA)



Watch Now From \$2.99 (SD) on Prime Video

In 2006-7 a group of investors bet against the US mortgage market. In their research they discover how flawed and corrupt the market is.

Director: [Adam McKay](#)
Writers: [Charles Randolph](#) (screenplay), [Adam McKay](#) (screenplay) | [1 more credit](#) »
Stars: [Christian Bale](#), [Steve Carell](#), [Ryan Gosling](#) | [See full cast & crew](#) »

81 Metascore From [metacritic.com](#) | 428 user | 454 critic | Popularity 434 (▲ 47)

Won 1 Oscar. Another 37 wins & 79 nominations. [See more awards](#) »

AJAX: Updating portions of the page from the database

These pages do not update once loaded

craigslist

post to classifieds
my account

search craigslist
search

event calendar
M T W T F S S
19 20 21 22 23 24 25
26 27 28 1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18

help, faq, abuse, legal
avoid scams & fraud
personal safety tips
terms of use ^{new}
privacy policy
system status

about craigslist
craigslist is hiring in sf
craigslist open source
craigslist blog
best-of-craigslist
craigslist TV
"craigslist joe"
craig connects

new york city mnh brk que brx stn jsy lgi wch fct

community
activities local news
artists lost+found
childcare musicians
classes pets
events politics
general rideshare
groups volunteers

personals
strictly platonic
women seek women
women seeking men
men seeking women
men seeking men
misc romance
casual encounters
missed connections
rants and raves

discussion forums
apple help photo
arts history p.o.c.
atheist housing politics
autos jobs psych
beauty jokes queer
bikes kink recover
celebs legal religion
comp linux romance
crafts m4m science
diet manners spirit
divorce marriage sports
dying media tax
eco money travel
educ motocy tv
feedbk music vegan
film nonprofit w4w
fitness open wed
fixit outdoor wine
food over 50 women
frugal parent words
gaming pets writing
garden philos yoga
haiku

housing
apts / housing
housing swap
housing wanted
office / commercial
parking / storage
real estate for sale
rooms / shared
rooms wanted
sublets / temporary
vacation rentals

for sale
antiques free
appliances furniture
arts+crafts garage sale
atv/utv/sno general
auto parts heavy equip
baby+kid household
barter jewelry
beauty+hilh materials
bikes motorcycles
boats music instr
books photo+video
business rvs+camp
cars+trucks sporting
cds/dvd/vhs tickets
cell phones tools
clothes+acc toys+games
collectibles trailers
computers video gaming
electronics wanted
farm+garden

services
automotive legal
beauty lessons
cell/mobile marine
computer pet
creative real estate
cycle skilled trade
event sm biz ads
farm+garden therapeutic
financial travel/vac
household write/ed/tran
labor/move

jobs
accounting+finance
admin / office
arch / engineering
art / media / design
biotech / science
business / mgmt
customer service
education
food / bev / hosp
general labor
government
human resources
internet engineers
legal / paralegal
manufacturing
marketing / pr / ad
medical / health
nonprofit sector
real estate
retail / wholesale
sales / biz dev
salon / spa / fitness
security
skilled trade / craft
software / qa / dba
systems / network
technical support
transport
tv / film / video
web / info design
writing / editing
[ETC]
[part-time]

resumes

english

nearby ci
albany
allentown
baltimore
binghamton
catskills
central nj
delaware
eastern ct
eastern shore
harrisburg
hartford
hudson valley
jersey shore
lancaester
long island
new haven
north jersey
northwest ct
oneonta
philadelphia
poconos
reading
rhode island
scranton
south coast
south jersey
western mass
williamsport
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FULL CAST AND CREW | TRIVIA | USER REVIEWS | IMDbPro | MORE SHARE

The Big Lebowski (1998) ★ 8.2 /10 609,031 ☆ Rate This

R | 1h 57min | Comedy, Crime | 6 March 1998 (USA)

0:31 | Trailer 9 VIDEOS 141 IMAGES

Watch Now
From \$2.99 (SD) on Prime Video ON DISC

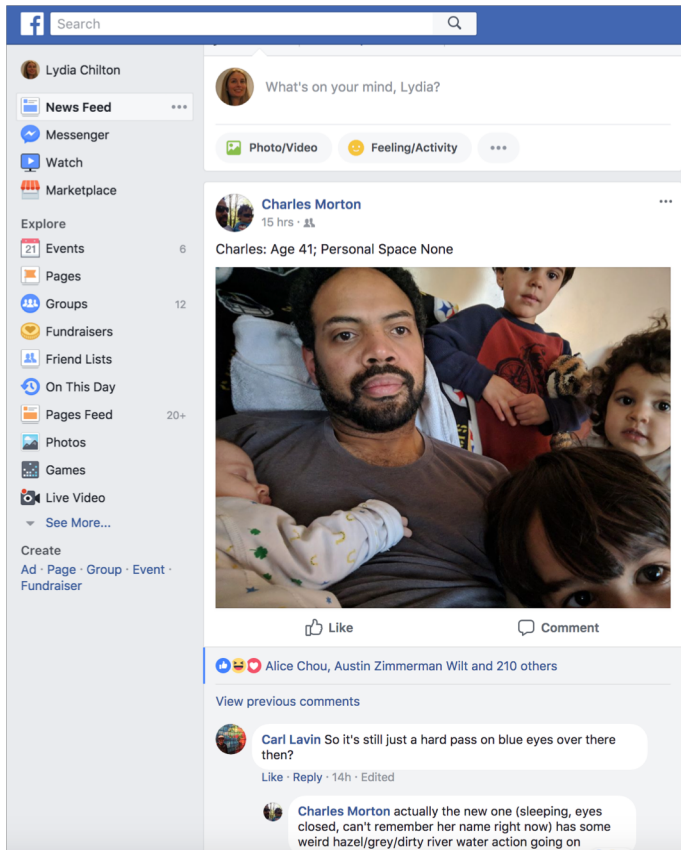
"The Dude" Lebowski, mistaken for a millionaire Lebowski, seeks restitution for his ruined rug and enlists his bowling buddies to help get it.

Directors: Joel Coen, Ethan Coen (uncredited)
Writers: Ethan Coen, Joel Coen
Stars: Jeff Bridges, John Goodman, Julianne Moore | [See full cast & crew »](#)

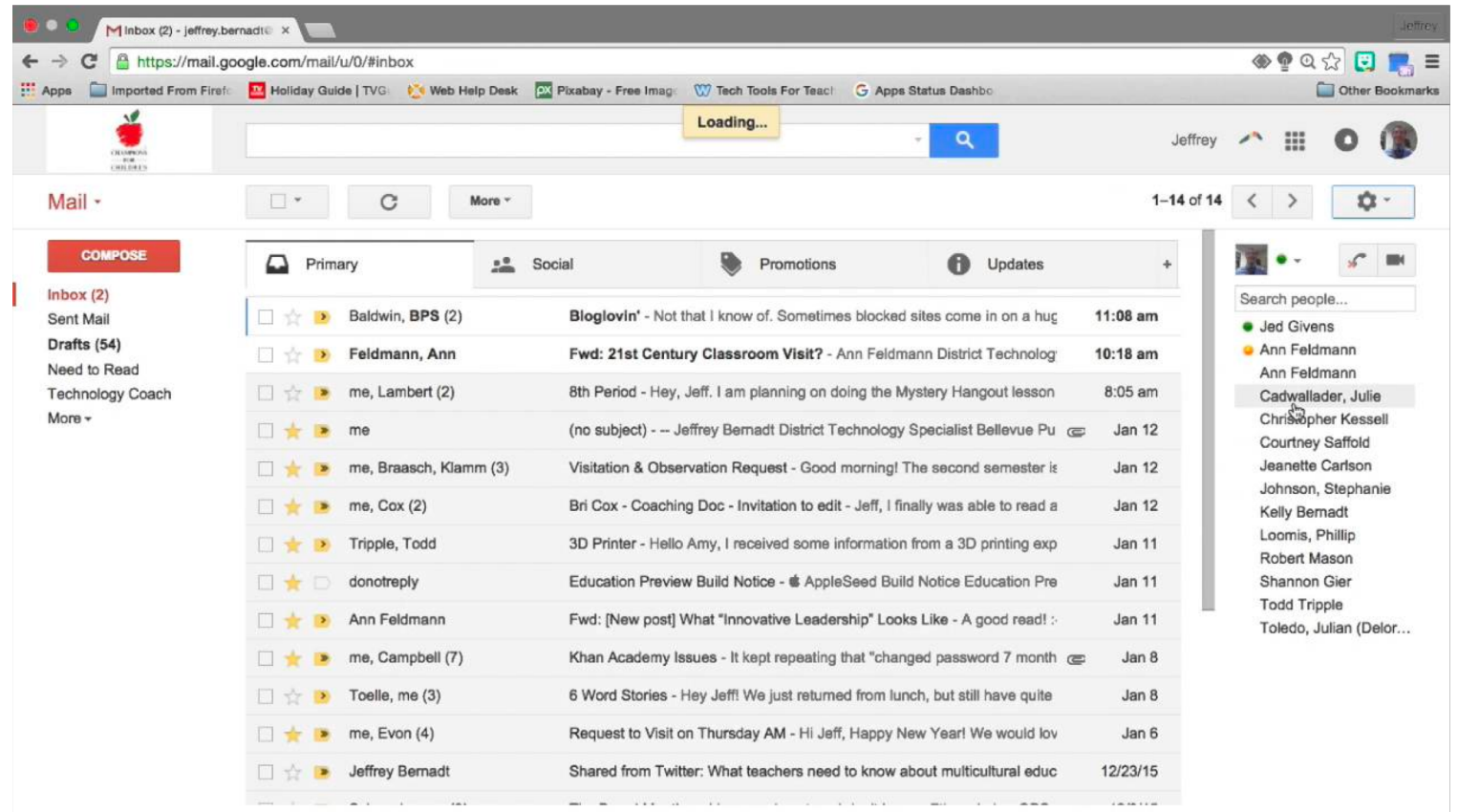
69 Metascore From metacritic.com | Reviews 1,075 user | 257 critic | Popularity 515 (▲ 32)

Top Rated Movies #167 | 4 wins & 17 nominations. [See more awards »](#)

These pages DO update once loaded




A screenshot of a Facebook post. The post is by Charles Morton, posted 15 hours ago. The post content includes a photo of a man (Charles Morton) and two children. Below the photo, there are interaction buttons for 'Like' and 'Comment'. A comment by Alice Chou, Austin Zimmerman Wilt and 210 others is visible, along with a comment by Carl Lavin. Another comment by Charles Morton is also visible.



A screenshot of a Gmail inbox. The inbox is titled 'Inbox (2) - jeffrey.bernad...' and shows a list of 14 emails. The first email is from Baldwin, BPS (2) with the subject 'Bloglovin!' and a timestamp of 11:08 am. The second email is from Feldmann, Ann with the subject 'Fwd: 21st Century Classroom Visit?' and a timestamp of 10:18 am. The third email is from me, Lambert (2) with the subject '8th Period - Hey, Jeff. I am planning on doing the Mystery Hangout lesson' and a timestamp of 8:05 am. The fourth email is from me with the subject '(no subject) - -- Jeffrey Bernadt District Technology Specialist Bellevue Pu' and a timestamp of Jan 12. The fifth email is from me, Braasch, Klamm (3) with the subject 'Visitation & Observation Request - Good morning! The second semester is' and a timestamp of Jan 12. The sixth email is from me, Cox (2) with the subject 'Bri Cox - Coaching Doc - Invitation to edit - Jeff, I finally was able to read a' and a timestamp of Jan 12. The seventh email is from Tripple, Todd with the subject '3D Printer - Hello Amy, I received some information from a 3D printing exp' and a timestamp of Jan 11. The eighth email is from donotreply with the subject 'Education Preview Build Notice - AppleSeed Build Notice Education Pre' and a timestamp of Jan 11. The ninth email is from Ann Feldmann with the subject 'Fwd: [New post] What "Innovative Leadership" Looks Like - A good read! .' and a timestamp of Jan 11. The tenth email is from me, Campbell (7) with the subject 'Khan Academy Issues - It kept repeating that "changed password 7 month' and a timestamp of Jan 8. The eleventh email is from Toelle, me (3) with the subject '6 Word Stories - Hey Jeff! We just returned from lunch, but still have quite' and a timestamp of Jan 8. The twelfth email is from me, Evon (4) with the subject 'Request to Visit on Thursday AM - Hi Jeff, Happy New Year! We would lov' and a timestamp of Jan 6. The thirteenth email is from Jeffrey Bernadt with the subject 'Shared from Twitter: What teachers need to know about multicultural educ' and a timestamp of 12/23/15.

What portions of this page update?



The image shows a screenshot of a Facebook news feed. On the left is a navigation sidebar with options like News Feed, Messenger, Watch, Marketplace, and various explore categories. The main content area shows a post by Lydia Chilton asking "What's on your mind, Lydia?". Below it is a post by Charles Morton, 15 hours old, with a photo of a man and children. The post has 210 likes and a comment from Carl Lavin. A reply from Charles Morton is also visible.

Lydia Chilton

What's on your mind, Lydia?

Photo/Video Feeling/Activity

Charles Morton
15 hrs · 🌐

Charles: Age 41; Personal Space None

Like Comment

Alice Chou, Austin Zimmerman Wilt and 210 others

View previous comments

Carl Lavin So it's still just a hard pass on blue eyes over there then?
Like · Reply · 14h · Edited

Charles Morton actually the new one (sleeping, eyes closed, can't remember her name right now) has some weird hazel/grey/dirty river water action going on

What portions of this page update?

The image shows a screenshot of a Facebook news feed. At the top, there is a search bar and a navigation menu on the left with options like News Feed, Messenger, Watch, Marketplace, and various explore categories. The main content is a post by Charles Morton, 15 hours old, with a photo of a man and children. Below the photo are like and comment buttons, and a list of users who liked the post. A red rectangular box highlights the post's content area, including the photo, the like/comment buttons, the list of likers, and the comment section.

Lydia Chilton

What's on your mind, Lydia?

Photo/Video Feeling/Activity

Charles Morton
15 hrs · 11

Charles: Age 41; Personal Space None

Like Comment

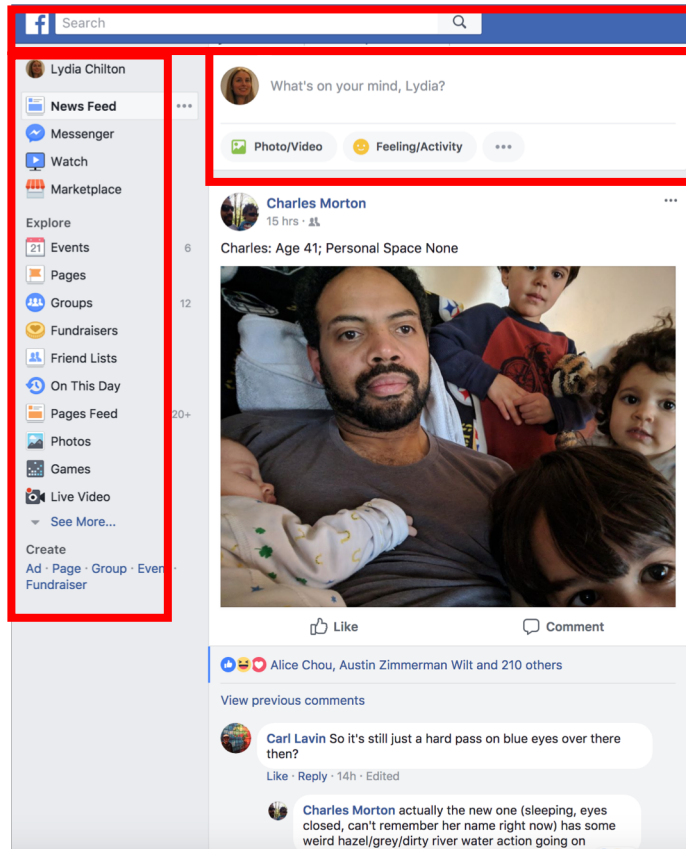
Alice Chou, Austin Zimmerman Wilt and 210 others

View previous comments

Carl Lavin So it's still just a hard pass on blue eyes over there then?
Like · Reply · 14h · Edited

Charles Morton actually the new one (sleeping, eyes closed, can't remember her name right now) has some weird hazel/grey/dirty river water action going on

What portions of this page DO NOT update?



GET vs POST request

Request_type =GET

url = /search?query=big_Lebowski&user=chilton

The data is put in the URL

- The data can be seen.
- The data can be cached. (the link can be shared)
- But it's annoying when it's long, or json formatted

Request_type =POST

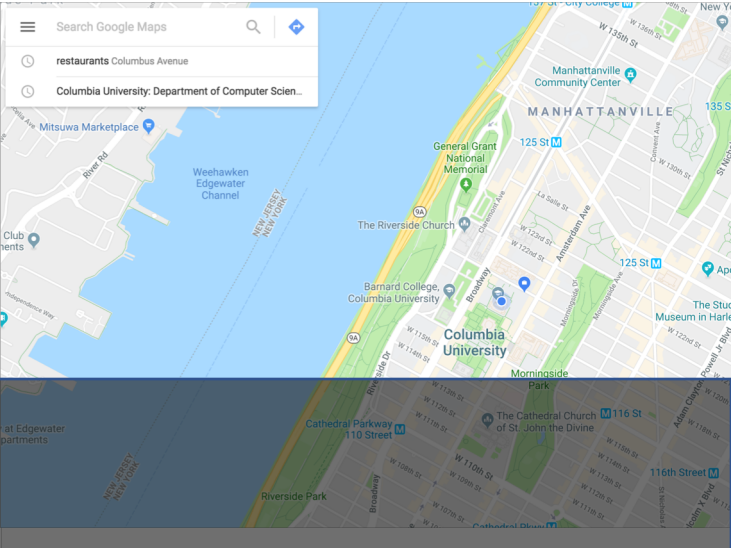
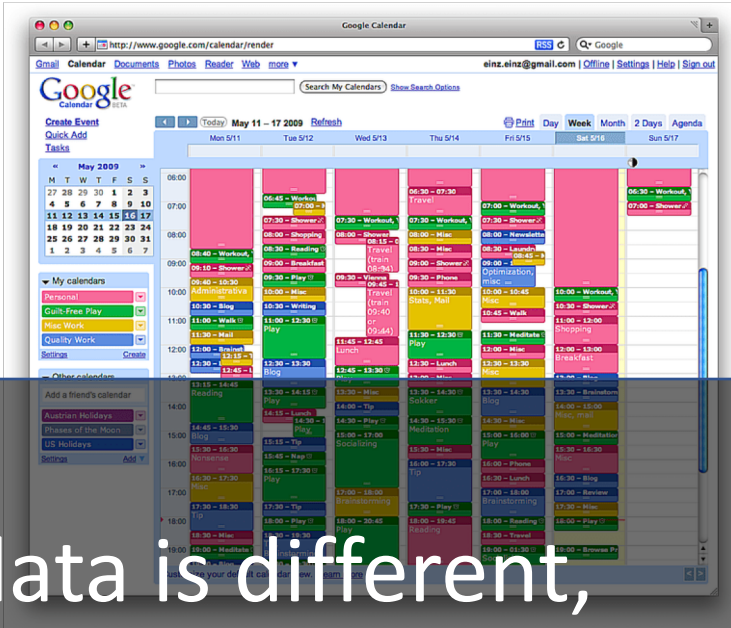
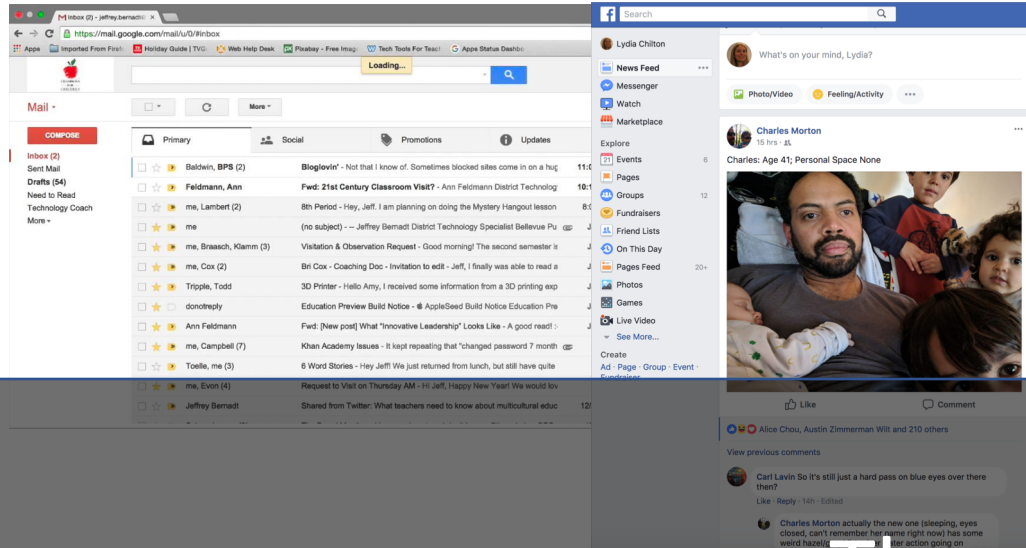
url = /search

data =query=big_Lebowski&user=chilton

The data is inside the request object

- Good for longer, more complex data
- But it's annoying when it's long, or json formatted

From a back-end perspective Facebook, Gmail are very similar. What's different?



The data is different,
And the information needs they serve are different.



You can drive a lot of human behavior
with one database update.

Summary

Sites with lots of data use databases

A screenshot of a Facebook page for 'PictureCorrect Photography Tips'. The page header includes the name and a blue 'facebook' logo. Below the header, there are several posts from users like Adel Gomaa and Richard, discussing photography tips and resolutions for 2011. The posts include text and small profile pictures.

A screenshot of a Google Calendar interface. The main view is a weekly calendar for May 2009, showing events from Monday to Sunday. The events are represented by colored blocks with titles and times. On the left, there are navigation options like 'Create Event', 'Quick Add', and 'Tasks'. The top of the browser window shows the URL 'http://www.google.com/calendar/render' and the user's email 'einz.eina@gmail.com'.

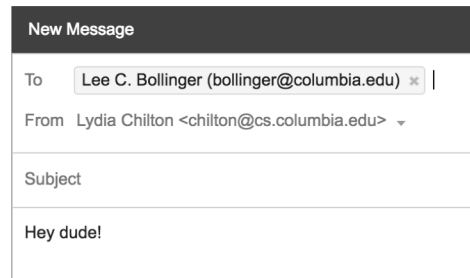
A screenshot of The New York Times website. The main headline is 'Trump in Shutdown Talks With Schumer'. Below the headline is a sub-headline 'White House Invites Democratic Leader to Negotiate a Deal'. The article text is visible, starting with 'The government will shut down at 12:01 a.m. Saturday if lawmakers fail to get an agreement on some kind of spending bill.' There are also several opinion pieces and other news items visible on the page.

A screenshot of an eBay listing for a 'Gorgeous new 6ft. tall throne chair - \$1199 (Brooklyn)'. The listing includes a photo of a red and gold throne chair. Below the photo, there is a description of the chair and a 'Buy It Now' button. The listing also shows the seller's name 'condition new' and some feedback information.

Front-ends and back-ends are tightly coupled.
So you need to know something about back-end databases
To create awesome websites

CRUD: Operations for interacting with a database

Create



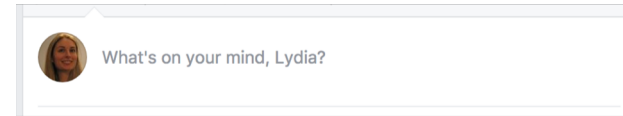
New Message

To Lee C. Bollinger (bollinger@columbia.edu) ✕ |

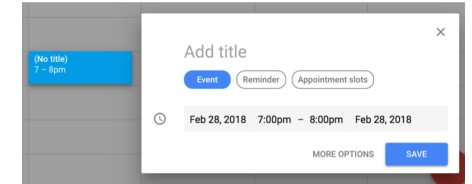
From Lydia Chilton <chilton@cs.columbia.edu> ▾

Subject

Hey dude!



What's on your mind, Lydia?



Add title

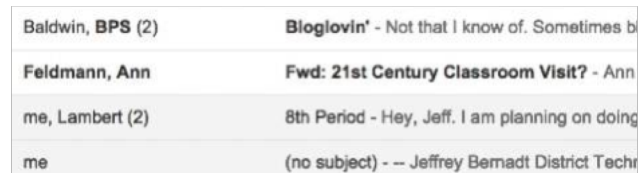
(No title)
7 - 8pm

Event Reminder Appointment slots

Feb 28, 2018 7:00pm - 8:00pm Feb 28, 2018

MORE OPTIONS SAVE

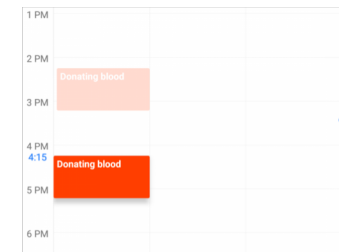
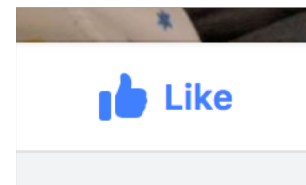
Read



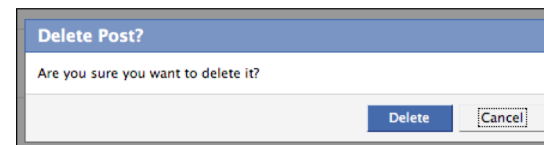
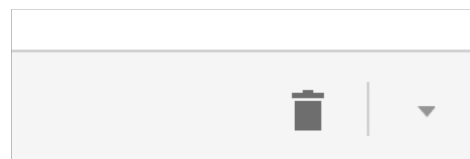
Baldwin, BPS (2)	Bioglovin' - Not that I know of. Sometimes b
Feldmann, Ann	Fwd: 21st Century Classroom Visit? - Ann
me, Lambert (2)	8th Period - Hey, Jeff. I am planning on doing
me	(no subject) - -- Jeffrey Bernadt District Techn



Update



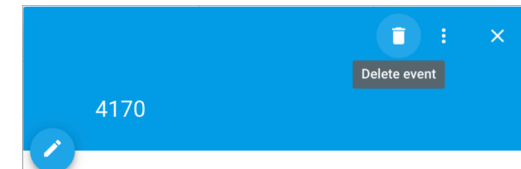
Delete



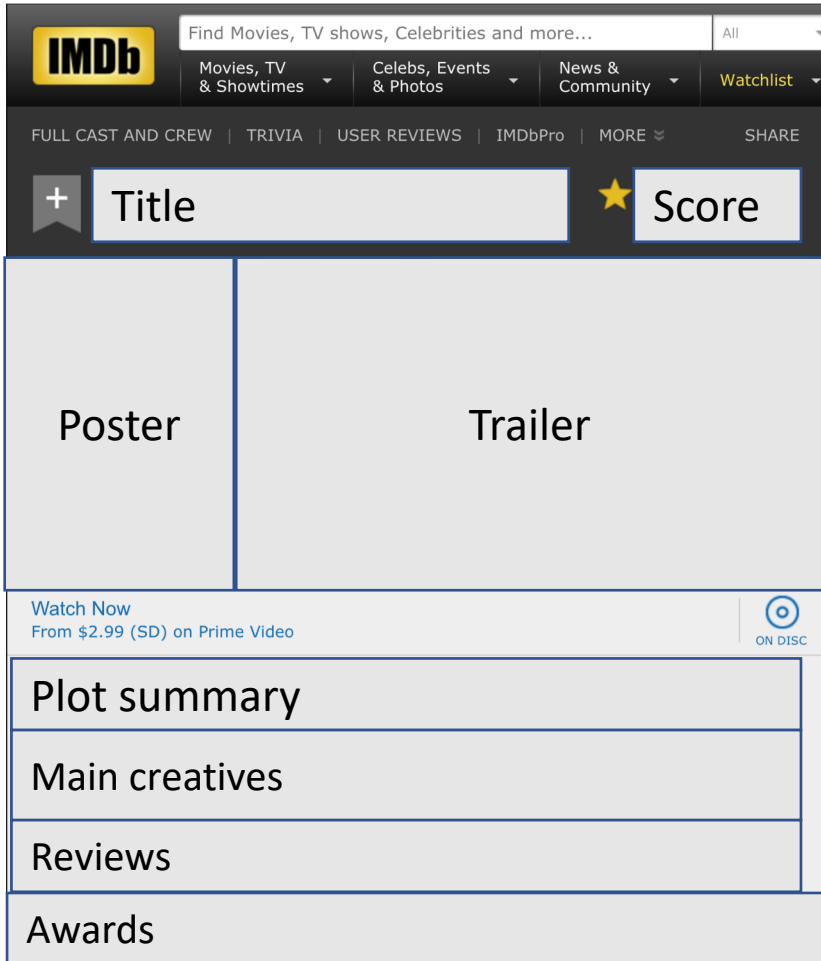
Delete Post?

Are you sure you want to delete it?

Delete Cancel



Use templates to dynamically generate pages from data in the database



Title	Plot summary	poster	year
The Big Lebowski	“The dude” Lebowski, mistaken...	Lebowski.jpg	1998
The Big Short	In 2006-7 a group of investors...	Big_short.jpg	2015
The Big Chill	A group of 7 former roommates	Big_chill.jpg	1983



Some sites reload portions of the page

Does not reload

IMDb Find Movies, TV shows, Celebrities and more... All

Movies, TV & Showtimes | Celebs, Events & Photos | News & Community | Watchlist

FULL CAST AND CREW | TRIVIA | USER REVIEWS | IMDbPro | MORE | SHARE

The Big Lebowski (1998) ★ 8.2 609,031 Rate This

R | 1h 57min | Comedy, Crime | 6 March 1998 (USA)

Watch Now From \$2.99 (SD) on Prime Video

"The Dude" Lebowski, mistaken for a millionaire Lebowski, seeks restitution for his ruined rug and enlists his bowling buddies to help get it.

Directors: Joel Coen, Ethan Coen (uncredited)
Writers: Ethan Coen, Joel Coen
Stars: Jeff Bridges, John Goodman, Julianne Moore | See full cast & crew >

Metascore 69 From metacritic.com | Reviews 1,075 user | 257 critic | Popularity 515 (32)

Top Rated Movies #167 | 4 wins & 17 nominations. See more awards >

Reloads

Search

Lydia Chilton What's on your mind, Lydia?

News Feed | Messenger | Watch | Marketplace

Explore | Events | Pages | Groups | Fundraisers | Friend Lists | On This Day | Pages Feed | Photos | Games | Live Video | See More...

Create | Ad · Page · Group · Event · Fundraiser

Charles Morton 15 hrs · 11

Charles: Age 41; Personal Space None

Like Comment

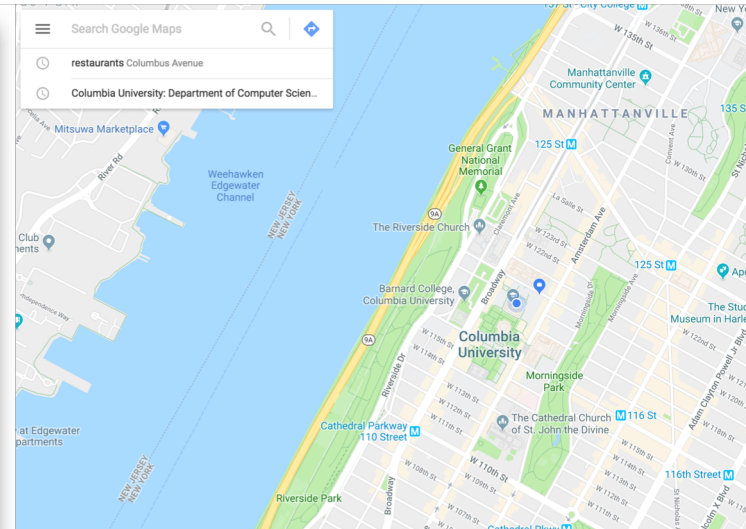
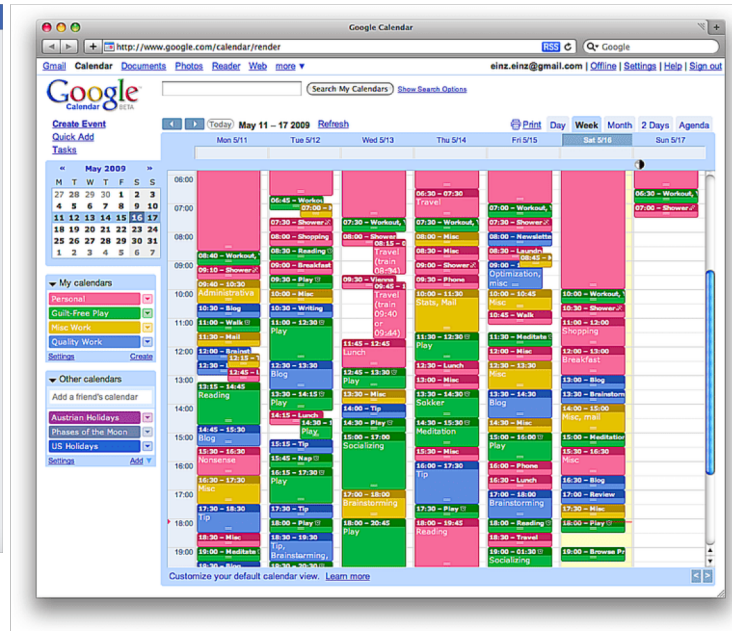
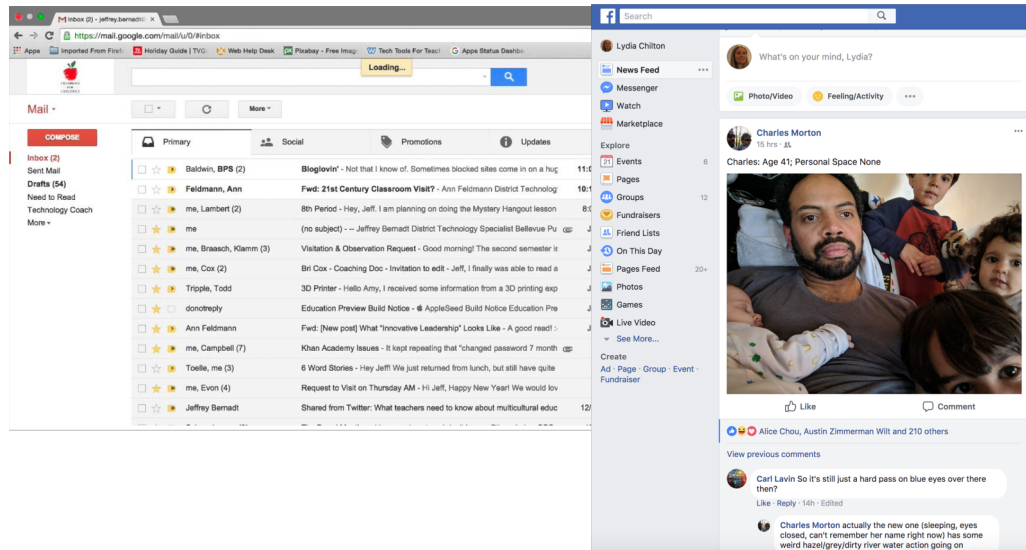
Alice Chou, Austin Zimmerman Wilt and 210 others

View previous comments

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But they serve different data and different information needs