

## HW7: Brainstorming & Background Research

Due dates:

- Individual warm up due Wednesday 3/26 *before your TA session*. Submit on Courseworks and brings your materials to section ready to present. No grace period.
- Team warm up due Friday 3/28 at 11:59pm on Courseworks. 8am Saturday grace period.
- Main due Wednesday 4/2 *before your TA session*. Submit on Courseworks and brings your materials to section ready to present. No grace period.

From now until the end of the semester, all the homework will be building up to the final project. Each week, you will complete one aspect of the design process. If you complete every week's assignment faithfully, you will have fully completed the project by the end of the semester.

To give you an overview of the final project, here are the main specifications you need to know now. Every week, we'll give more specifics on what we expect:

**Requirements:** The project for the second half of the class is to:

- Design and build a **web** application
- To help a user learn an introductory topic **interactively**
- Within a **domain of your choosing**
- The interactive experience centers around **media** (image, video, audio, code, etc.)
- And help them assess their learning with a **quiz**.
- And keep learning through **feedback** from the quiz.
- In under **10 minutes** total

**User:** The user should be someone in this class. Your TA must also feel like this is something valuable for them to learn (otherwise they won't be able to give you feedback). In this class, we focus on designing *for people* and *getting feedback* from the people we are designing for. To do this, we need to have a ready supply of people we are designing for. Hence, we are designing for people in this class. Consequently, you **cannot** design for: (bad)

- Kids or teenagers (they aren't in this class)
- People who only speak Serbian (everyone in this class speaks English)
- Architecture Majors. Not enough people in this class are Architecture majors – plus Architecture Majors don't need to learn introductory topics. But you could teach an introductory topic in architecture to a CS student who wants to learn something cool and useful about Architecture when they browse the streets of NYC.
- The hands of poker. Almost everybody in this class took the same introductory CS class you did and had to program the rules of poker already. But, there are other things and other games that you could teach people about.

**Topic:** The topic may be in a domain of your choice (e.g. chess, basketball, art history), but the topic within the domain must be small enough that it can be learned in 10 minutes, but also hard enough that your users don't already know it. For example:

- **Bad:**

- how to play chess (too hard: way too big for 10 minutes),
- How to DJ (too hard: way too big for 10 minutes)
- How to identify art movements (too hard: too many art movements to do in 10 minutes, and some of them are very easy to identify)
- How to play chess (too hard)
- identifying the chess pieces (too easy – most people in this class probably know at least 50% of the pieces)
- Which bin to put things in the recycle. Most people know 90% of the recycle rules (there are just a few tricky one). They may or may not follow them. You could make this a viable idea by changing to “which recycle bin – the hard cases” for which you ask people which items they struggle with classifying for recycling (like pizza boxes with grease... can they be recycled as cardboard or not? Plastic bags?). That would be the right size of task, hard enough that people want to learn it and valuable enough that people would want to learn it.
- Count to 5 in German. Although people may or may not know this – what need to be learned is to memorize 5 things. It's just not that hard, and there are great solutions out there already to help you do vocabulary memorization.
- Learn the Arabic alphabet. Too hard to memorize 30+ things. You could possibly reduce this to a small and interesting subset to find a better scoped topic.
- Distinguish a major chord from a minor chord. (Almost everyone can do this without 10 minutes of training)

- **Good:**

- how and when to perform 3 different opening moves in chess for chess beginners (who already know the moves the pieces can make, because that's mostly common knowledge). For someone who knows chess pieces casually, and might want to start to play, learning the opening moves is useful, interesting, and can be done in 10 minutes.
- how to identify a “pick and roll” in basketball for casual NBA fans. This is a slightly advanced basketball move that is used frequently. It's hard to identify in game play. People who casually watch the NBA often have a hard time learning what these advanced moves are and how to identify them in games to better understand the strategy being used.
- how to tell impressionist paintings from post-impressionist paintings for ArtHum students. These two movements are hard to tell apart for casual viewers, but have several features that distinguish them, making it valuable to learn and possible to teach in 10 minutes.

- how to mix a drop swap for aspiring DJs. This focuses on one particular skills. If someone is interested in learning what DJing really entails, it teaches a concrete skill to get them started.

**Interacting with media:**

People learn through interaction and feedback. Thus, the method by which you teach your topic must include interacting with media. A terrible way to learn is to go read a Wikipedia page about something (art history, music theory, statistics, architecture, basketball, model-view-controller), and then be expected to perform a skill based on that “info dump”.

If your design does not have interaction and media you will receive a zero for the assignment. Here are two common designs that receive zeros for failing to be interactive enough:

- The user reads long blocks of text on the topic. Users hate this. They don’t read the text. They skip it. This is a design fail. If you include text, it should be 2-3 sentences at a time.
- The user has to watch a 1-10 minute video on a topic. This is ineffective at teaching. Users will play the video, but they usually don’t pay attention. If you include video/audio, each clip should be less than 30 seconds long (5-10 seconds is much better)

A much better way to learn is through interaction – like Duolingo or Codecademy (founded by two Columbia students) – where you get to practice and get feedback.

**Individual warm-up (due Wednesday 3/26 before section)**

This is to be performed individually, without teammates.

1. **Logistics.** On Wednesday, you will meet your TA in person during lecture time (or through another arrangement. We want to make sure you know what those arrangements are.
  1. Who is your TA. What is their name and email. You can find the name of your TA on Coursework under People > TA Groups.
  2. When and where will you meet on Wednesdays? Your TA should have reached out to you. If not, reach out to them.
2. **Brainstorm 5 domains.** What are 5 domains that you could teach things to your classmates?
  1. Note: These must be things where you already know a lot of stuff, because you obviously can't teach a topic that you don't know well.
  2. Note: domains are broad like chess, basketball, art history. Next, we'll think about specific topics, which are much less broad
3. **Brainstorm specific topics.** For each of those 5 domains, list 5 specific topics that you could teach interactively in under 10 minutes.
  1. For each specific topic,
    - a) What media would you use?
    - b) What would you quiz users on to test their knowledge? (a short sentence or phrase is fine)
  2. Note: It has to be hard enough that people don't already know it, but specific enough that you can teach it in 10 minutes.
  3. Note: To get from a broad domain to a specific topic, you may need to narrow the topic down more and more. For example: Art History -> The Modern Era -> Identifying types of paintings -> identifying post-impressionist paintings.
4. **Select favorite topics.** Of these 25 potential topics, which are your favorites? List between 3 and 6 topics that you would be willing to pursue. PRESENT THESE IN YOUR SLIDES FIRST.

What to turn in:

- A PDF or PDF(s) of slides. Be prepared to present these slides during section. Present your favorite topics first. Your "presentation" should take 30-60 seconds to simply ready your first slide.

Group Warm-up (due Friday 3/28 by 11:59pm).

This assignment is to be turned individually. However, there are parts that need to be done individually and parts that need to be one together. For group parts of the assignment, all team members can (and must) turn in the same answers.

5. **Group members.** Who is in your group? List all the members including their names, emails and phone numbers (you may XXXX out the last 4 digits for privacy if you want). We just want to make sure you have a way to contact each other in an emergency.
6. **Google Drive.** Make a google drive folder for your group. Include you TA on this drive as an editor. To prove you've done this, copy the link to the drive as the answer to this question.
7. **Group topics.** As a group, make a list of the 5 topics that you are all collectively most excited about.
8. **Group Competitor Analysis.** For every member of the group, identify one competitor for them to analyze. (See Problem 3 from the main assignment)

What to turn in:

- A PDF or PDF(s) with your answers to all the questions.

### Main Assignment:

This assignment has both group and individual parts. Each question is labeled as **group** or **individual**. You must make an individual submission to Courseworks for all the content, even the group work. All group members must turn in identical work for group parts of the assignment.

1. **Individual. User Interview.** For one of the domains you are considering teaching, find a target user (someone in this class) and interview them for 10-20 minutes. Get a sense of what they already know about the topic, and what they might be interesting in learning about it. If you can't find a user interested in the domain, you'll have to pick a new domain.
  1. **Interview them.** Turn in a document with 3 insights you got from the interview (things you didn't know about people's experiences with this topic and domain before)
    1. Some sample questions to get you started:
    2. Domain questions: (ex. "Chess" is a domain)
      - What are your experiences around (domain)? If this goes well, you can follow up about more specific topics.
      - What do you already know about (domain)? If this goes well, you can follow up about more specific topics?
      - What's interesting to you about (domain)?
    3. Topic questions: (ex. "Opening moves" is a topic in the domain of chess)
      - Have you ever heard of (topic)?
      - What do you know about (topic)?
      - If they don't know much, you might have to tell them a little bit about it or show an example.
      - If the topic is interesting to them, why is the topic hard for you?
      - If the topic is interesting to them, why? How might they use this knowledge? Ideally, what problem do they have that your website might help them solve.
  2. Who is that person? (what's their name, age, relevant details like major, interests etc.)
    1. Example. *I interviewed Jeff, he's a college student in computer science. His roommate plays chess. Jeff knows the basics of chess, but nothing about how to play well. He wants to be able to chat to his roommate about his interests.*
  3. From this interview, what is a viable topic you could teach? (you should have found at least one, ideally 3). For each topic, say:
    1. What's the domain?
    2. What's the specific topic?
    3. What makes you think the person is interesting in learning that? (give your reasoning and share a quote)
    4. What's hard about this topic? (give your reasoning and share a quote).

2. **Individual. Competitor Analysis.** In your group, each person should analyze a different competitor product. For your chosen product, do the following:
  1. What topic does it teach? (if it teaches multiple topics – like multiple coding languages), pick one to focus (like JavaScript) on for the sake of concreteness.
  2. Who is the target audience (or who do you think benefits the most from it)?
  3. What media does it use to help people learn? (show a screenshot and describe it in a sentence)
  4. What is a major way it uses interaction to help people learn? (show a screenshot and describe it in a sentence)
  5. What are 3 things you like about the interaction and media usage that help people learn? (what might inspire your design?)
    1. Show a screen shot for each one.
  6. What are 3 things that could be better or different about the interaction and media usage that help people learn?
    1. Show a screen shot when applicable.
3. **Group.** Prepare a set of slides with key findings. Be prepared to show them to your TA during your mentoring session on Monday.
  1. **Topics.** What are 5 potential topics your group would all be willing to pursue in this class going forward. For each topic, which group members are experts on the topic.
  2. **Interviews.** Share quotes from user interviews that were particular insightful. Show your answers to the questions. Say who in your group conducted that interview.
  3. **Competitor Analysis.** Share two competitor analyzes that you did that were particularly insightful. Show your answers to the questions we asked about them. Say who in your group did that competitor analysis.

What to turn in:

- Individually, turn in PDFs with your answers to all the questions 1 and 2
- Everyone in the group should turn in the same PDF of the slides for problem 3.