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### Homework #8: Brainstorming

1.

5 Domains:

- A. Programming mobile applications
- B. Designing Circuits
- C. Plant identification
- D. Columbia
- E. Terminal Programming/Navigation

2.

- Programming mobile applications
  - Introduction to iOS's UIKit
    - Media: images of different phones screens; users can connect the screens together by dragging and dropping segues (this resembles linking screens together in UIKit); would also introduce basic code/have empty textboxes where users can enter code and the phone screen would change
    - Quiz: After presenting users with the necessary information, have them link together phone screens and fill out textboxes of code to create a proper application
  - Introduction to iOS's SwiftUI
    - Media: an image of a blank phone screen and empty textboxes; also images that users can make appear by writing the correct code
    - Quiz: After presenting users with the necessary information, instruct them to create a simple, specified, view, given some starter code
  - Introduction to Android Studio
    - Media: an image of a blank phone screen and empty textboxes; also images that users can drag and drop to the screen
    - Quiz: After presenting users with necessary information, instruct the users to use the website to create a simple application that simulates pressing a button and increasing a counter
  - Introduction to Firebase
    - Media: Images of the firebase database (which get updated as the code changes) as well as empty textboxes where users can enter code
    - Quiz: After presenting users with a basic tutorial, instruct them to make a simple, specified database

- Introduction to User Authentication
  - Media: Textboxes and buttons that users can press to simulate creating a new user/signing a user in; users can utilize other empty textboxes to write code that modifies the behavior of the sign in/sign up page
  - Quiz: After presenting users with necessary information, instruct them to arrange the buttons/textboxes and type the necessary code to create a basic authentication page
- Designing circuits
  - Setting up a Power Supply
    - Media: Draggable and droppable power supply wires that lead to a circuit board – hovering over them provides more info about them
    - Quiz: After presenting users with several examples, ask them to hook up the power supply correctly to create a basic circuit on the simulator
  - Lighting up an LED
    - Media: Draggable and droppable circuit board parts – hovering over them provides more info about them
    - Quiz: After presenting users with an in-depth explanation of how to make an LED light up with the circuit board, ask them to recreate this using the simulated circuit board
  - Creating a counter
    - Media: Draggable and droppable circuit board parts – hovering over them provides more info about them
    - Quiz: After demonstrating to users how to use a 7-segment LED and a basic binary counter, ask them to wire up a binary counter correctly
  - Short circuit
    - Media: Draggable and droppable circuit board parts – hovering over them provides more info about them
    - Quiz: After explaining, through several example, the dangers of a short circuit and how to cause one, ask users to wire up a short circuit and have them view the results
  - Buzzer circuit
    - Media: Draggable and droppable circuit board parts – hovering over them provides more info about them
    - Quiz: After using several examples to show users how to correctly create a button causes a buzzing sound when pressed, ask them to recreate this
- Columbia
  - Tunnel System
    - Media: An interactive map of various Columbia buildings and the connecting tunnels underneath them

- Quiz: After letting users explore the map, ask them several questions about how to get to one building from another using the tunnels
  - Butler
    - Media: An interactive map of Butler; hovering over different parts of the map provides users with info about different rooms and secret locations
    - Quiz: Present users with pictures of various rooms throughout Butler and ask them question about the rooms presented
  - History
    - Media: An interactive map of campus – hovering over different parts of the map presents information about different historical events that happened at that location
    - Quiz: Have users answer several relevant historical questions
  - Famous alumni
    - Media: Various pictures of famous alumni; clicking on each picture reveals information about the alumnus/alumna
    - Quiz: Present the user with various famous individuals and quiz the user as to whether the individual is an alumnus/alumna
  - Dining halls
    - Media: Interactive images of the various dining halls on campus; clicking on each picture will reveal information about each dining hall
    - Quiz: Present users with hypothetical meals and question them as to which dining hall the meal most likely came from
- Plant identification
  - Mushrooms
    - Media: A image of a garden full of mushrooms; mousing over each mushroom provides information about it, including edibility and species
    - Quiz: Present users with various pictures of mushrooms and quiz them, asking them if each mushroom is edible/what species each mushroom is
  - Beans
    - Media: An image of a bowl full of beans; mousing over each bean provides information about it, including preparation methods and species
    - Quiz: Present users with various pictures of beans and quiz them, asking them the type of each bean/dishes that are commonly made with the bean
  - Poison Ivy
    - Media: Images of various plants; hovering over each one explains the characteristics that indicate the plant isn't (or is) poison ivy

- Quiz: Present users with various images of plants and have them determine if each plant is poison ivy.
  - Marijuana Plant
    - Media: Images of various plants; hovering over each one explains the characteristics that indicate the plant isn't (or is) a marijuana plant
    - Quiz: Present users with various images of plants and have them determine if each plant is a marijuana plant
  - Tomatoes
    - Media: An image of different tomatoes in a basket – hovering over each tomato reveals a pop-up indicating the species of tomato and information about it
    - Quiz: Present users with various images of tomatoes and have them identify each species of tomato
- Terminal programming/navigation
  - Basic commands
    - Media: An interactive simulated terminal on a website that allows users to navigate around using commands such as “ls”, “cd”, etc.
    - Quiz: After presenting users with the necessary information, instruct users to navigate to a certain folder on the site and update a file
  - Vim
    - Media: An interactive simulated terminal on a website that allows users to open and edit a file using Vim
    - Quiz: After presenting users with the necessary information, ask them about several shortcuts on Vim, and instruct them to write to a file using Vim
  - Bash scripts
    - Media: An interactive simulated terminal on a website that allows users to write basic scripts
    - Quiz: after presenting users with the necessary information and showing them a few examples of bash scripts, ask them to write a basic bash script
  - Intro to C programming
    - Media: An interactive simulated terminal on a website that allows users to create basic C programs
    - Quiz: After presenting users with the necessary information and showing them a few examples of C programs, ask them to write and compile a basic C program
  - Terminal games
    - Media: An interactive simulated terminal on a website that allows users to read about the history of creating games using bash scripts; users can also play several games

- Quiz: Have users plays several games they have already seen and ask them some historical facts about the games they played

3. My favorite ideas of the 25 listed are:

1. Columbia – Butler
2. Columbia – Tunnel System
3. Programming Mobile Applications – Introduction to Firebase
4. Plant Identification - Mushrooms