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Problem Solving and Software Design Term Project

**Project Proposal**

**The Big Idea**

The main idea for our project is an application or website to help college students work out in limited space (like dorm room) and with limited time. The idea for this program is to simulate a magic 8 ball). A magic 8 ball displays a random answer from a predetermined pool of options. This is what we want to do but instead of generating random answers to questions, our program will generate random sets of exercises. Our minimum viable product (MVP) is a program that will generate a random yet predetermined set of exercises for a full body workout. With the MVP the user can prompt the program to display a set of exercises that the user will perform. Our stretch goal would be to have a program that even though it will generate random exercise sets, it stays within the parameters set by the user regarding the type of workout they want to perform. For example, the user can choose to do a workout that exercises only legs and core and they could choose to do a short or long workout, and the program will generate random sets of exercises that still meet these requirements.

**Learning Goals**

The main shared goal among the teammates beside creating a program that works, would be to gain an understanding of how Python works and how to use its logic at the moment of creating something.

Allison: Learn the numerous possibilities that Python has to offer so that I can integrate it in my problem solving toolkit. In the future when I encounter a problem that I need to solve, I have knowledge of yet another possible way to fix it. One might think of a software as a way to solve a problem but unless you have programming knowledge or experience you do not really understand what can and cannot be done and how you should go about doing it. I will be working in the Investment Banking Industry and Python is a common program used in this industry. In things from back office software to trading bots and machine learning initiatives, having a knowledge of programming and Python will give me a great advantage at my job.

Sarah: Gain a better understanding of Python functions and the logic behind creating them. I want to learn how multiple functions come together to make a working program. I want to learn how to debug in an efficient manner using breakpoints. This experience will help build my programming skill set.

Shriya: Create a tangible working game while exposing myself to different libraries and frameworks. I would like to be able to have a really good understanding of this so I can talk about doing cross functional work with more technical teams during interviews.

**Implementation Plan**

In order to provide the exercise to the user, we would hope to use both images and text. Since we have not used images in class to date, we wanted to find a library that would allow us to do so. From our research we would like to use PIL: Python Imaging Library. This will add image processing capabilities. Additionally this library supports many different file formats, and has strong graphic capabilities.

Professor has suggested that we use the Flask Framework.  Flask supports extensions that can add application features as if they were implemented in Flask itself. It also does not require any particular libraries. We will research this framework and learn the basic way to use it  before we can determine how useful it will be to our project.

**Project Schedule**

Week 1: (Oct 15-21) Focus on solidifying idea and getting together the proposal

Project Proposal due Oct.15th.

Week 2: (Oct 21-28) Put together list of exercises and images and questions to ask. Research

Flask/ other libraries to use, and understand how they will fit into the project.

Week 3:(Oct 29- Nov 4) Start trying to pull together data into a database.

Week 4:(Nov 5-11) Create Code in Python to tie data/ everything together

Week 5: (Nov 12-18) Continue to work on code and test, meet with professor if needed to get

extra help/feedback

Week 6:(Nov 19-25) Thanksgiving week. Focus on making up any goals that have not been reached, if anything is not working. No new work.

Week 7: (Nov 26- Dec 2) Bring work together in a presentable format.

Nov 29th Mid Project Presentations

Week 8: (Dec 2- Dec 8) Focus on Final Touches and code runs/ no errors, put together a powerpoint presentation to show to the class

Dec.6th Project Due, and Final Presentation

**Collaboration Plan**

We will divide task among the teammates according to each one’s strengths. One of our teammates has previous experience with creating databases which will be a crucial aspect in this project in the generation of exercise sets. Another one of our team members has experience with web tech (HTML, CSS, and Javascript) so she will focus on more of the web, interface, and UI portion of the project. The third teammate’s strength is in python coding and logic mapping. This will help creating functions and connecting databases with the front end of the program, and creating an overall structure for the project. Even though we will all contribute to the code, we will try to divide the tasks as consistent to the teammates’ strengths as possible. We will meet every week to test and discuss each person’s work and determine the next steps. These will serve as one week sprints and in every meeting we will discuss the steps we need to take next to stay on track with the deadline.

**Risks**

The biggest risks to the success of this project are project scope and time. We believe our program is a feasible project, but we may need to scale it back in order to meet our essential project goals. Based on our current skills we will be able to program many of the functions needed, but additionally we must learn new skills, modules, and packages. Learning new skills will take time and we must balance learning and application to make sure we have working code. Through this process we will be spending a lot of time debugging which we must manage and work together to mitigate issues. The biggest risk is avoiding a lengthy learning curve to learn the programs necessary to create the program.

**Additional Course Content**

We will need to learn how to use databases with Python. The program will need multiple tables to store data. We will also need to learn how to use Python Flask with the web framework. It would be very helpful to learn how UI is developed with Python. Another topic to explore would be APIs and how they can be integrated. Learning about APIs would be beneficial for this project and future programming projects to understand when an API would be effective to use.

Exhibit 1: Mockup of Access Database

