CPSC 326: Learn-a-Language Project

Multiple Due Dates

The goal of this project is to work in a team of two to learn a new programming language and use it to develop an application. This project has four deliverables: (1) a project proposal; (2) a status update; (3) a program written in the language; and (4) a presentation.

Project Proposal (Due Thursday, March 23rd). The proposal involves the following steps:

1. Select a language to learn (other than Haskell and Prolog, which we'll cover in class). You must pick a language that supports functional programming, either through explicit functional features or that is considered a functional language. Some examples of languages with functional features include Java, JavaScript, modern C++, Python, JavaScript, and Erlang. Some examples of functional programming languages include F#, Scala, ML, LISP, Clojure, and OCaml. If you pick a language that isn't functional, you will need to focus on the functional features of the language. If you pick a language with a syntax similar to C++ or Java, focus on the features that distinguish the language from what you already know. The goal is to learn something new.
2. Find online resources that you will start looking at to help you learn the language.
3. Brainstorm a programming project related to one of the following themes:
   - Environmental Sustainability
   - Access to Healthcare
   - STEM Education
   - Homelessness and Housing
   - Civic Engagement

   When brainstorming your app to develop, identify:
   (a) who the potential users are
   (b) what the needs of the users are (i.e., what problems or "pain points" do they have) with respect to the theme
   (c) the value that the app would have for these users (how it solves their "pain points")
   (d) the app features that would be needed to provide this value

   Your job will be to develop a prototype (i.e., not all features need to be implemented and/or implemented fully) of this app in the language you selected. Your prototype should be a proof-of-concept of your app so that others can get a sense for how your app would function. Your prototype must be implemented such that it uses a majority of the main constructs of the programming language you choose (including the functional features).

Hand in your proposal with the language you are going to learn, a brief description of why you selected the language, a description of your app (the theme, the users and pain points, and the features), a brief sketch of what the prototype will consist of, and the initial language resources you will be looking at.

Status Update (Due Thursday, April 13). Turn in a one-page description of the progress you have made. By this point, you should have a clear understanding of the language (possibly with a few things still left to learn) and a good start on your app. Your update must include:

1. A summary of how far you are, including what resources you have finished
2. A list of what you are still trying to figure out, if anything
3. A description of your prototype app (which should be more concrete than in your proposal)

4. What features you have implemented and the overall design

Presentation and Program (Due at Final Exam). You must hand in your finished program and give a presentation on your project results. Your presentation must be at most **8 minutes long** and include:

1. A brief overview of the history and main features of the language you selected
2. The main programming constructs supported by the language with examples
3. A description and demo of the program you wrote
4. Highlights of your program's design (in terms of how you implemented it)
5. A summary of your overall impressions of the language

You will given your presentation in class (each team member must present for a roughly equal amount of time). You must also turn in a copy of your slides as well as hardcopy of the source code for your application. You should also either upload a zip file of your source code or provide me with a link to the source code with instructions on how to run it (e.g., via GitHub or else on ada).