CPSC 1301K   We Solve It! Project   Spring 2023

You are allowed (and encouraged) to work on this assignment with up to 2 classmates.

Purpose
The purpose of this assignment is to use the programming skills we have learned to develop a program that addresses a real world problem. Outside of a classroom, whether you go to work for a company or start your own business, you will use programming to develop solutions to problems that have not been previously coded. Part of your job will be to identify problems and apply computational thinking (problem decomposition, abstraction, pattern recognition, and algorithmic thinking) to develop solutions. For this assignment you must use all of the following to create code to solve a real world problem:

- Functions
- Loops
- Lists
- Selection statements
- Input validation
- File input/output

Practice in these fundamental computer science skills as well as in real world problem solving are essential for success in Computer Science 2 and valuable in future math and MIS courses as well.
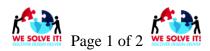
Tasks:
1) **Proposal:** Identify a problem that YOU encounter in your daily or weekly routine that a Python script would help with. You should identify a specific problem that can be addressed in a small application, working prototype or a proof of concept. Write a proposal (approximately one to two paragraphs) listing your group members and your selected problem. Include multiple (two to four) strategies for addressing the problem. Strategies can include solutions that are not possible yet. Propose one or more solutions for each strategy. Include the benefits and disadvantages of each solution. Indicate which solution your team will implement and why it was selected. For your solution, identify what will be the input(s) (for example, files, a user typing, etc.) and what will be the output(s). Your proposal must be approved by your instructor before moving on to coding your solution. Submit one per team in one of the following formats: .txt, .doc, .docx, or .pdf.
   Submit in CougarVIEW by Wednesday, April 19th at 10:00 PM.

   Grading Criteria: 15 points
   a. Lists all groups members (or identifies a group of 1 individual)
   b. Demonstrates the ability to construct a <u>clear problem statement</u> with evidence of many relevant contextual factors as it relates to real world scenarios. (Contextual Factors: Constraints (such as limits on cost), resources, attitudes (such as biases) and desired additional knowledge which affect how the problem can be best solved in the real world or simulated setting.)
   c. Identifies <u>multiple possible strategies</u> to the problem that apply within a specific context
   d. Identifies advantages and disadvantages for each possible strategy
   e. Identifies the chosen strategy that the team will implement (and why it was chosen)
   f. Identifies the input(s) and output(s) of solution
   g. Identifies how file(s) and list(s) will be incorporated

2) **Code & Supporting Files:** Write a script using Python 3 that solves one problem to help someone solve a problem that they may face during a global pandemic. Utilize all the coding elements listed above. Use only relative file names (so that they will work on another computer). **Also submit any input or other files needed to run your script**.
Submit in CougarVIEW by Wednesday, May 3rd at 10:00 PM.

Grading Criteria: 85 points
a. Addresses address the problem selected and provide a solution
b. Uses all of the Python code elements listed above
c. Runs without errors (syntax, runtime, and logic) [so use input validation, etc.]
d. Provides a usable interface. (Does the user know what is expected of them in terms of input? Can the user understand the output?)
e. Code is properly documented with comments at the top of each code file and with explanations throughout the code where necessary. All methods have a comment indicating description, parameters, and return value (when applicable).

Note, if you're working in a group, and want to receive a copy of your scores and feedback, then just submit something in CougarVIEW that indicates your group members' names.

This culminating assignment allows you to apply the concepts learned throughout the course. Consequently, authorized sources are limited. Additionally, you are encouraged to work extensively with your group members. Other authorized sources include the TA, CSU CS tutors and Dr. Carroll.

Where can you get help?

Course Textbook
Course Materials
Educational References
Other
Online Resources

Encouraged
Ask Dr. Carroll
Need to Cite

Who Can Help You

CSU CS Tutors
Dr. Carroll
Teaching Assistant (TA)
Group Members
Other Students
Online Forums
Other People
Other

Encouraged
Not Acceptable
Need to Cite