

One submission per team of up to 3 students (Teams of 1, 2, or 3)

## Background

People need to be prepared for a natural disaster of any kind. Having lived in Florida (hurricanes and tornadoes) and Colorado (blizzards and ice storms), my family has been through a lot of weather conditions that could lead to a disaster. In most cases, but not all, you may have time to prepare when you hear that the weather is coming. In some cases, you may have to prepare well before it happens to be ready to keep your family safe.

## Task

Oftentimes, disaster strikes, and people feel helpless as they are totally unprepared. It does not have to cost a lot of money to be prepared for most disasters. We are going to help empower these people by creating a program/application that gives them information in disaster preparedness, and/or for what to do after the disaster strikes.

For this assignment your team will need to create several deliverables:

- |   |          |                                |
|---|----------|--------------------------------|
| • We Solve It - Group Project Proposal  | 10/27/23 | 6 points                       |
| • We Solve It - Group Project Analysis  | 11/3/23  | 19 points                      |
| • We Solve It - Group Project Code      | 11/17/23 | 75 points                      |
| • We Solve It - Reflection (Group)      | 11/27/23 | 20 points                      |
| • We Solve It - Reflection (Individual) | 11/27/23 | 10 points (per person on team) |

## Proposal

Identify 1 disaster people can plan/prepare for. See <https://www.ready.gov/> and click on “disasters and emergencies” for the different types of disasters and how it is recommended to plan for them. (There are 28 types of disasters listed!) Tip: You can modify these suggestions to be more rigorous if you want to. There is also information in other areas for what to do after an emergency.

Write a proposal (approximately one paragraph) listing your group members, selected problem, and proposed programming solution. This must be approved by your instructor before proceeding.

Turn it in as a .txt, .doc/docx, or.pdf file on CougarVIEW.

## Computational Thinking Analysis

Use computational thinking to analyze your proposed solution. Have a paragraph describing each of:

- A summary of the problem that your team proposed to solve
- How you decomposed the problem
- How you abstracted real world data into variables and functions
- How you found patterns that you used to create code structures and
- The algorithm you designed for your program solution

Turn it in as a .txt, .doc/docx, or.pdf file on CougarVIEW. This must be approved by your instructor before moving on to coding your solution.

## Code

Write a program to implement your solution using Python 3. Utilize all the coding structures we've learned in this class:

- variables
- operations
- functions
- selection statements
- loops
- input validation
- lists
- file input/output

Document your code thoroughly. Each function should have a comment introducing it. All code should have header blocks identifying the assignment, class, team, and last date modified. Turn in .py file(s) on CougarVIEW.

## Reflections

There is one group reflection document to submit and then each team member should submit an individual reflection document, as follows:

The group should provide a text description of their overall experience:

- What went well – technical or group
- What didn't go as well – technical or group
- What would you change knowing what you know now
- Could the application actually be further developed to help people? If so, how? If not, what would be a good alternative development?

The individual reflection document should be done by each team member.

- What did you contribute to each part of the project?
- What did you learn during the application development process (positives and negatives)?

Turn these two documents in as a .txt, .doc/docx, or .pdf file on CougarVIEW.

## Grading Criteria

1) 6 pts - Project proposal

- a) Lists all groups members (3pts)
- b) Demonstrates the ability to construct a clear problem statement 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.) (3pts)

## 2) 19 pts – Computational Thinking Analysis

Be sure to include the following:

- a. Explains how you decomposed your selected problem (3 pts)
- b. Explains how you abstracted real world data and processes into code (3pts)
- c. Explains any patterns you found and how you translated these into code (3pts)
- d. Explains the algorithm you designed for the problem solution (5 pts)
- e. Identifies multiple possible strategies to the problem that apply within a specific context (5 pts)

## 3) 75 pts – Python Code

- a. Code addresses the problem selected and provides a solution? (15 pts)
- b. Code use structures learned in the course (variables, operations, selection statements, loops, input validation, file input/output, and functions) – no global code; uses a main function as well as helper functions appropriately (15 pts)
- c. Code runs without errors (syntax, runtime, and logic) (15 pts)
- d. Program provides a usable interface. Input requests are concise. Output is clear and understandable (15 pts)
- e. Code is properly documented with identifying information at the top of the code (name of group members and purpose of the program are listed) and explanations with the use of comments throughout the code where necessary (major sections of code have a comment)? All functions have a comment indicating parameters, return, and purpose? (15 pts)

## 4) 20 points Group Reflection

Answers should be thorough and thoughtful – with at least a paragraph for each. The group should provide a text description of their overall experience:

- Group members
- What went well – technical or group (5 points)
- What didn't go as well – technical or group (5 points)
- What would you change knowing what you know now (5 points)
- Could the application actually be further developed to help people? If so, how? If not, what would be a good alternative development? (5 points)

## 5) 10 points - Individual Reflection

Answers should be thorough and thoughtful – with at least a paragraph for each.

- Your name
- What did you contribute to each part of the project? (5 points)
- What did you learn during the application development process (positives and negatives)? (5 points)