CS 161A: Programming and Problem Solving I

Assignment 1 Algorithmic Design Document

Make a copy before you begin (File -> Make a copy). Add the Assignment # above and complete the sections below BEFORE you begin to code. The sections will expand as you type. When you are finished, download this document as a PDF (File -> Download -> PDF) and submit to D2L.

This document contains an interactive checklist. To mark an item as complete, click on the box (the entire list will be highlighted), then right click (the clicked box will only be highlighted), and choose the checkmark.

Planning your program before you start coding is part of the development process. In this document you will:

- ❏ Write a detailed description of your program, at least two complete sentences
- ❏ If applicable, design a sample run with test input and output
- ❏ Identify the program inputs and their data types
- ❏ Identify the program outputs and their data types
- ❏ Identify any calculations or formulas needed
- ❏ Write the algorithmic steps as pseudocode or a flowchart
- ❏ Tools for flowchart - Draw.io - Diagrams.net

2. Program Description

In the box below, describe the purpose of the program. You must include a detailed description with at least two complete sentences.

Program description:
Laundry is a simple process using a washer and dryer. You will be able to clean your clothes by following these steps.

3. Sample Run

If you are designing your own program, you will start with a sample run. Imagine a user is running your program - what will they see? What inputs do you expect, and what will be the outputs from the given inputs? Choose test data you will use to test your program. Calculate and show the expected outputs. Use the sample run to test your program.

Sample run:
By following the steps, at the end you will have a stack of clean, folded clothing

4. Algorithmic Design

Before you begin coding, **you must first plan out the logic** and think about what data you will use to test your program for correctness. All programmers plan before coding - this saves a lot of time and frustration! Use the steps below to identify the inputs and outputs, calculations, and steps needed to solve the problem.

Algorithmic design:
a. Identify and list all of the user input and their data types.
Dirty laundry, detergent, washer, and dryer.
b. Identify and list all of the user output and their data types.
Folded clean clothing
c. What calculations do you need to do to transform inputs into outputs? List all formulas needed, if applicable. If there are no calculations needed, state there are no calculations for this algorithm.
No calculations
d. Design the logic of your program using pseudocode or flowcharts. Here is where you would use conditionals, loops or functions (if applicable) and list the steps in transforming inputs into outputs. Walk through your logic steps with the test data from the assignment document or the sample run above.
Pseudocode: 1. Get dirty clothing, detergent, washer, and dryer. 2. Sort dirty clothing into 3 piles: colors, white, and darks. 3. Put 1 pile of dirty clothing into washer. 4. Add detergent. 5. Press start and wait for cycle to end. 6. If not clean, repeat steps 4-5. 7. Put washed clothing into dryer. 8. Press start and wait for cycle to end. 9. If not dry, repeat step 8. 10. Remove clothing from dryer

11. Repeat steps 3-10 for remaining piles.
12. Fold clothing.