Assignment 01 Sample 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 it to D2L.

This document contains an interactive checklist. To mark an item as complete, click on the box.

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

- Step 1: Write a detailed description of your program, at least two complete sentences
- Step 2: Design a sample run with test input and output
- Step 3: Algorithm design
  - ☐ 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. Look at the Pseudocode syntax at the bottom of this document. Tools for flowchart - Draw.io - Diagrams.net

Video

Watch the video for this sample assignment. The video uses repl.it as the IDE, but you can use IDLE or Pycharm to code your assignment.

Program chatbot.py

1. 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:
For this sample assignment, we will create a chatbot program. The program will ask the user 2 questions and respond accordingly. A computation will be done on a number they enter.

2. 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:

```
Welcome to my ChatBot program!

What is your name? Sally
Hello Sally! It is so nice to meet you!

What is your favorite number? 5
5 is my favorite number too!

Did you know 5 + 5 = 10?
Did you know 5 * 5 = 25?

It was nice chatting with you. Goodbye!
```

3. 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.
○ name as a string ○ number as an integer
b. Identify and list all of the user output and their data types.
○ doubleNum as an int ○ squareNum as an int
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.
○ I will double the input number by adding the number with itself ○ doubleNum = number + number ○ I will square the input number by multiplying the number by itself ○ squareNum = number * number
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.
1. DISPLAY Welcome message

2. DECLARE name as string
3. DECLARE number as int
4. DISPLAY What is your name?
5. INPUT into name
6. DISPLAY their name in a hello message
7. DISPLAY What is your favorite number?
8. INPUT into number
9. DISPLAY a message saying that is my favorite number too, echo number
10. SET doubleNum to number + number
11. SET squareNum to number * number
12. DISPLAY a message with their number doubled
13. DISPLAY a message with their number squared
14. DISPLAY a goodbye message, echo their name