

COS 135 Individual Assignment 6

Due: Monday 03/21/22 End of the day

What to submit:

- Please submit a .zip file with source codes. Your programs must produce similar outputs as given if the same inputs are provided.

[10 pts] Comments are required in the following locations (in each C source code):

- At the top of the source code comment your name and a short program description.
- Comment the purpose of each variable.
- Comment major sections of code such as input, processing, and output.

Program Design: Your program is a professional document and must be neat and easy to read. All programs should follow these specifications.

- Comments should be aligned and entered in a consistent fashion
- Blank lines should be added to aid readability
- Code within blocks should be indented
- Comments should not contain spelling mistakes
- Variable names should be meaningful

Write C programs for following tasks and submit your source codes (you must submit .c files without compilation warnings or errors). Sample Program inputs are highlighted in yellow.

(a) (25pts) You've been hired to help write the software for an automatic change dispenser, the kind you see attached to a cash register, that automatically dispenses the right coins depending on the amount of change that's owed to the customer. Write a program that first prompts for a number from 0 to 99 (representing the amount of change that's due) and then outputs the number of quarters, dimes, nickels, and pennies that should be dispensed. (Hint: You may use integer division and the % operator to determine the remainder.)

<u>Sample output #1:</u> Change due (only 0 - 99): 64 Quarters: 2, dimes: 1, nickels: 0, pennies: 4	<u>Sample output #1:</u> Change due (only 0 - 99): 164 Invalid input.
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(b) (20pts) Write a C program to continuously check whether an alphabet entered by the user is a vowel or a consonant. **A user has to enter '#' to exit the program.**

First your program must verify the character entered by the user is part of the English alphabet (can be lowercase or uppercase). If yes, check it for a vowel or a constant.

<u>Sample output #1:</u> Enter a letter: a a is a vowel	<u>Sample output #2:</u> Enter a letter: N N is a consonant.
<u>Sample output #3:</u> Enter a letter: \$ \$ is not a letter in the English alphabet	<u>Sample output #4:</u> Enter a letter: # BYE!

(c) (20pts) Write a C program to find the sum of all even numbers between **1** and **n**. *User has to input the **n** number and **the program has to verify this is a number before calculating the sum** (hint: `scanf()` function returns the number of characters read from `stdin`).*

<u>Sample output #1:</u> Input a number larger than 1: 100 Sum of even numbers between 1 and 100: 2550	<u>Sample output #2:</u> Input a number larger than 1: S Invalid input
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(d) (25pts) The Fibonacci sequence is a series where the next term is the sum of pervious two terms. The first two terms of the Fibonacci sequence are 0 followed by 1 (*hint: you may save these two starting values in two variables at the beginning*).

The Fibonacci sequence: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144..... N

Write a program to output the Fibonacci sequence up to a given number by a user. Your program should verify the user's input as a positive integer.

<u>Sample output #1:</u> Enter a number: 90 Fibonacci Series: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89	<u>Sample output #2:</u> Enter a number: -9 Invalid input – please try a positive integer.
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