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Department of Computer Science / Software
Engineering
Fall 2022
CSC 103 - PROGRAMMING FUNDAMENTALS
THEORY ASSIGNMENT 01

Due Date: November 12th 2022

Plagiarism policy is minus-100%.

PROBLEM 01:

Take a 3 digit number as input, find if the number is an Armstrong number and if the number is an Armstrong number print the three digits one by one on separate lines. [An Armstrong number of three digits is an integer such that the sum of the cubes of its digits is equal to the number itself. For example, 371 is an Armstrong number since $3^3 + 7^3 + 1^3 = 371$]

Bonus: Check the number of digits first. If the number contains less than 3 digits, print "error".

PROBLEM 02:

Take a 4 digit number as input and find the sum of digits of the number. If the sum is odd, print the square of the sum otherwise print the cube of the sum.

PROBLEM 03:

Take two numbers as input and swap the numbers without using an extra variable. Print the value of the two variables with their names before and after swapping the values.

Sample Input: 5 10

Sample Output:

Num1 before swapping is: 5

Num2 before swapping is: 10

Num1 after swapping is: 10

Num2 after swapping is: 5

PROBLEM 04:

Take a two digit number as input and print the number in reverse order.

NOTE: Do not print the digits of the number in reverse order; instead reverse the number and then print J

Sample Input: num = 267

Sample Output: revnum = 762

PROBLEM 05:

Write a program that prints the following menu then asks the user to enter the choice and based on the choice performs the task.

******Menu******

1- Armstrong number

2- Digit sum

3- Swap num

4- Reverse num

Sample Run 1:

Enter your choice: 1

Enter number: 367

Number is Armstrong

3

6

7

Sample Run 2:

Enter your choice: 2

Enter number: 3645

Sum is 18

324

PROBLEM 06:

Write a program that takes decimal numbers as input from the user and converts those numbers into the base specified by the user, until the user chooses to exit (i.e. user enters 'E').

Sample Input: (Note: **Red** refers to user input)

To convert into Hexadecimal Enter 'H'

To convert into Octal Enter 'O' Menu to be displayed to the user

To convert into Binary Enter 'B'

To exit Enter 'E'

>> **H**

Enter the decimal number : 100

Sample Output:

Decimal number 100 in base 16 is : 64

Note: You are NOT allowed to use any other placeholders other than %d and %c

PROBLEM 07:

Consider the sequence given below.

0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89,

Write a program which takes a non-negative integer as input and generates the sequence

depending on that input:

e.g.1. if the user inputs 5, following sequence should be generated i.e.

0, 1, 1, 2, 3, 5

e.g.2. if the user inputs 0, following should be generated i.e.

0

e.g.3. if the user inputs 11, the following sequence should be generated i.e.

0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89

PROBLEM 08:

Write a program that prompts the user for a positive integer as input, printing the respective hollow triangle:

Sample Input: (Note: Red refers to user input)

Enter a positive integer: 2

Sample Output:

```
  *
 * * *
```

e.g.2

Sample Input: (Note: Bold refers to user input)

Enter a positive integer: 3

Sample Output:

```
    *
  *  *
 * * * * *
```

e.g.3

Sample Input: (Note: Bold refers to user input)

Enter a positive integer: 5

Sample Output:

```
      *
    *  *
  *      *
*          *
*          *
* * * * * * * *
```

Submission Instructions:

Due Date: Nov 12, 2022

1. For C files, name your C files as questionNumber_yourRollNum_yourSection_TANumber.c (e.g. Q1_BSE-22F-123_SE1A_TA1.c).
2. Place all files in a folder and name the folder as yourRollNum_yourSection_TANumber (e.g. BSE-22F-123_SE1A_TA1).
3. Compress the folder by using either Winrar or 7Zip with the same name.
4. Go to tiny.cc/pffall2022smiu and in the “Coordination Document Folder” open the “PF-Activity Submission Form”.
5. Fill out all details with your correct password and submit the form by the due date.