CS F111 - Computer Programming - Lab 7

Date: June 1, 2021 - 5pm to 7pm.

- The lab is **EVALUATIVE**.
- Follow the instructions given below in the exact order.
- Any deviation from the instructions or incomplete steps will be dealt with according to the policy announced on quanta.
- Without the video recording link, the lab marks will be withheld.
- You may refer **ONLY** to the teaching materials shared by the course instructors.

LAB INSTRUCTIONS

(Please ensure that you follow the instructions in this order.)

1. Close all applications and browser-tabs except the ones needed during the lab, and join the Google meet assigned to your group..
2. Start recording your screen and webcam feed in the format mentioned in the "Software Prerequisites" document. Ensure that the date/time are visible.
3. Solve the questions given in the question paper.
4. When you are ready to submit your solution, upload your C program via the form given below:
   https://forms.gle/PjTNbMj9rZeyBsht7
   Please ensure that you use BITS email ID while filling the form.
5. Stop screen and webcam recording.
   Please click the "Stop recording" button only once. If you click it multiple times, you may lose the entire recording.
6. Upload the recording on your BITS Google Drive.
7. Edit the options on the uploaded recording to allow the "All can view" option and copy the link to be shared. If you're unsure about this, use the following link : https://tinyurl.com/GDriveuploadhelp
8. Submit the link of the recording via the form below by 5pm, 2nd June:
   https://forms.gle/oj7pDyeiu9k11aR56
   Please ensure that you use BITS email ID while filling the form.

Question 1 - (5 Marks):

The file `calculator.c` has a function `multiply` that shows how to recursively define multiplication. Similarly, define the below functions recursively so that

- `divide(x,y)` returns the quotient of dividing `x` by `y`. **(3 Mark)**
    - Example: `divide(7,2)` should return `3`.
- `exponentiate(x,y)` returns the exponentiation of `x` by `y`. **(2 Mark)**
    - Example: `exponentiate(2,3)` should return `8`.

Follow the below instructions exactly :

1. Assume that the input to your code consists only of positive non-zero integers.
2. Only add your code in the parts marked "`/* Code goes here */`"
3. Do NOT modify any other parts of the program.
4. Do NOT use `math.h` or any other libraries.
5. Do NOT use the arithmetic operators `*,/,%,*=,/=, %=` in your code.
6. Do NOT use looping constructs like `while, for, do-while` in your code.
7. You may use calls to other functions defined in the code.

Question 2 - (5 Marks):

Write a program `flip.c` that takes a matrix from the user as input in the format mentioned below and prints its *diagonal flip*.

Examples

Matrix A	Diagonal Flip of A
1 2 3 4 5 6	6 4 2 5 3 1
1 2 3 4 5 6 7 8 9	9 6 3 8 5 2 7 4 1

Test Case : 1

```
Enter number of rows and columns:
3
2

Enter row 1
1
2

Enter row 2
3
4

Enter row 3
5
6

Diagonal flip of the matrix is
6 4 2
5 3 1
```