

CS 150 Lab 7

Files & Loops

The objective of today's lab is to practice do-while loops and for loops.

- Be sure your output looks exactly like the specified output.
- Be sure to submit the completed project to CS150-01 Lab by Friday at 5pm.
- Be sure to follow the coding standards and add comments to your code!

Show the instructor or TA your solution after part is implemented below.

Lab 7.1

Write a complete C++ program in a project called **07_1_Money** that will determine whether you'd prefer to be paid \$1,000.00 a day for 25 days or a penny the first day, two pennies the second, four pennies the third day and so on, doubling the amount you made the previous day. There is no user input to this program and you *must* use a *for* loop.

Your output must look like the following. The x's should be replaced by the doubling amount on the 25th day and the total after summing all of the doubling amounts:

```
*****  
*                               *  
*               Money           *  
*****
```

| Day | Thousands | Doubling |
|-----|-----------|----------|
| 1 | 1000.00 | 0.01 |
| 2 | 1000.00 | 0.02 |

And so on until you reach the 25th day

| | | |
|-------|----------|--------|
| 25 | 1000.00 | xxxxxx |
| ----- | | |
| Total | 25000.00 | xxxxxx |

Show the instructor or TA your solution

Lab 7.2

Write a complete C++ program in a project called **07_2_Calculations** that reads in a number of integers from a text file named **numbers.txt** and performs some calculations on the file. The first number in the file is the number of integers that follow. For example, in the file below, the first number is 12, which tells us that there are 12 numbers in the file.

```
12 4 6 2 7 8 4 6 1 0 2 7 3
```

Your program must print out to the screen the even numbers, a count of the numbers, a count of the even numbers, the sum of all of the numbers, the largest number, and the smallest number.

```
*****  
*           Number Cruncher           *  
*****
```

```
4 6 2 8 4 6 0 2
```

```
Count: 12  
Number of evens: 8  
Sum: 50  
Largest: 8  
Smallest: 0
```

Show the instructor or TA your solution

Testing: Test your input on these input files.

Test1.txt

```
25 4 6 2 7 8 4 6 1 0 2 7 3 15 42 25 77 11 15 2 98 2 4 -9 7 0
```

Test2.txt

```
0
```

Optional Challenge: when outputting the even numbers, display those numbers 3 per line like this:

```
*****  
*           Number Cruncher           *  
*****
```

```
4 6 2  
8 4 6  
0 2
```

```
Count: 12  
Number of evens: 8  
Sum: 50  
Largest: 8  
Smallest: 0
```

Optional Challenge:

The first few Fibonacci numbers are 1 1 2 3 5 ... After the first two Fibonacci numbers, each subsequent number is found by adding the previous two numbers. Write a complete C++ that prints a table of Fibonacci. Your program must validate that the user enters a number larger than 2 using a do-while loop.

```
*****  
*           Fibonacci Table           *  
*****
```

```
Enter number of Fibonacci's: 0  
Enter number of Fibonacci's: -8  
Enter number of Fibonacci's: 6
```

```
Fibonacci Numbers
```

```
-----  
1  
1  
2  
3  
5  
8
```

Show the instructor or TA your solution

- 1) Your programs are to compile without any errors or warnings.
- 2) Do not use any magic constants in your program. Define your constants before defining the rest of your program's variables.

Once your project is complete, place your solution into the CS150-01 Drop folder on Turing. Your solution is to have ALL previous projects completely working and correct.