CS101 – Programming Fundamentals (Free Course on YouTube)
Learning with Danyal Imran
danz1ka19
danz1ka19
danz1ka19

Problem Set #1

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Introduction

You're in your final lap of the grand prix, and this is your moment to show the world what you're made of. You are trailing behind X cars, and you need to cross each car fast to take the lead and crown yourself. Each race car is going to ask you a question, if you can solve it, you take the lead over him (hopefully he doesn't ask you a question), and then move to the next car until you win.

See you at the finish line.

Mathematical Problems

Question #1 – Even or Odd

You're given an integer N. Write a program to tell if the number N is odd or even.

Case #1

Input: 1231

Output: Odd

Case #2

Input: 5125232

Output: Even

Question #2 – Factorial

You're given an integer N. Write a program to calculate the factorial of that number N.

Formula: N! = 1 * 2 * 3 * ... * N-1 * N

Case #1

Input: 4

Output: 24

Case #2

Input: 6

Output: 720

Question #3 – Sum of Digits

You're given an integer N. Write a program to calculate the sum of all the digits of N.

Case #1

Input: 12345

Output: 15

Case #2

Input: 4512353

Output: 23

Question #4 – Average of N Integers

You're given an integer N. Followed by integers M, N number of times. Write a program to compute the average of the N integers.

Case #1

Input: 3

10

20

30

Output: 30

Case #2

Input: 5

1

1

11

1

1

Output: 3

Question #5 – Prime Test

You're given an integer N. Write a program that will tell if integer N is prime or composite.

Case #1

Input: 27

Output: Composite

Case #2

Input: 17

Output: Prime

Question #6 – Reversing a Number

You're given an integer N. Write a program that will reverse the number N.

Case #1

Input: 123

Output: 321

Case #2

Input: 123321

Output: 123321

Swapping

Question #7 – Swapping

You're given two integers, X and Y. Write a program that will swap the numbers if X is greater than Y.

Case #1

Input: 10 24

Output: 10 24

Case #2

Input: 12 8

Output: 8 12

Pattern Printing

Question #8 – Right-Angled Triangle

You're given an integer N. Write a program to print a N by N sized right-angled triangle of asterisks.

Case #1

Input: 2

Output:

```
*
**
```

Case #2

Input: 3

Output:

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

Question #9 – Another Weird Pattern

You're given an integer N. Write a program to print a N by N sized upside-down right-angled triangle besides another N by N sized inverted upside-down right-angled triangle of asterisks.

Case #1

Input: 3

Output:

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

Case #2

Input: 5

Output:

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

Conversion

Question #10 – Binary

You're given an Integer N. Write a program that converts that integer to binary.

Case #1

Input: 12

Output: 1100

Case #2

Input: 31

Output: 11111