Calcutta Institute of Engineering and Management

Department of Information Technology

IT Workshop (Python) - PCC-CS393

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Signature of the Faculty with Date

Question-1

WRITING IN ALL CAPS IS LIKE YELLING.

Best to use your “indoor voice” sometimes, writing entirely in lowercase.
In a file called indoor.py, implement a program in Python that prompts the user for input and then outputs that same input in lowercase. Punctuation and whitespace should be outputted unchanged. You’re welcome, but not required, to prompt the user explicitly, as by passing a str of your own as an argument to input.

Test Your Code

• Run your program with python indoor.py. Type THIS IS IT WORKSHOP and press Enter. Your program should output this is it workshop.
• Run your program with python indoor.py. Type 50 and press Enter. Your program should output 50.

CODE:

```
uppercase_string = input('Enter an uppercase string: ')
print(uppercase_string.lower())
```

OUTPUT:

```
Windows PowerShell
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PS F:\COM.PROG.DOCS\CODE FILES\Lang\Python\Week 1> python indoor.py
Enter an uppercase string: THIS IS IT WORKSHOP
this is it workshop
```

Question-2

Some people have a habit of lecturing speaking rather quickly, and it'd be nice to slow them down, aka YouTube's 0.75 playback speed, or even by having them pause between words.

In a file called playback.py, implement a program in Python that prompts the user for input and then outputs that same input, replacing each space with ... (i.e., three periods).

CODE:

```
str = input('Enter a sentence: ')
for x in str:
    if x==' ':
        print("...", end="")
    else:
        print(x, end="")
```

OUTPUT:

```
Windows PowerShell
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PS F:\COM.PROG.DOCS\CODE FILES\Lang\Python\Week 1> python playback.py
Enter a sentence: This is IT Workshop
This...is...IT...Workshop
```

Question-3

Even if you haven't studied physics (recently or ever!), you might have heard that E = mc2, wherein E represents energy (measured in Joules), represents mass (measured in kilograms), and c represents the speed of light (measured approximately as 300000000 meters per second), per Albert Einstein et al. Essentially, the formula means that mass and energy are equivalent.

In a file called einstein.py, implement a program in Python that prompts the user for mass as an integer (in kilograms) and then outputs the equivalent number of Joules as an integer. Assume that the user will input an integer.

CODE:

```
mass = int(input('Enter the mass: '))
speedOfLight = 300000000
joules = mass*speedOfLight*speedOfLight
print(joules)
```

OUTPUT:

```
Windows PowerShell
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PS F:\COM.PROG.DOCS\CODE FILES\Lang\Python\Week 1> python einstein.py
Enter the mass: 5
4.5e+17
```

Question-4

Write a program in a file called energy_calculation.py which can calculate the kinetic and potential energy of an object given the mass, velocity and height. (g = 9.8 ms-2) (Assume that the mass is in kg, height is in m and velocity is in m/s).

K.E. = 1/2 × m × v^2
P.E. = m × g × h

CODE:

```
mass = int(input('Enter mass: '))
height = int(input('Enter height: '))
velocity = int(input('Enter velocity: '))
g = 9.8
KE = (0.5)*mass*velocity*velocity
PE = mass*g*height
print("Kinetic Energy: {}J".format(KE))
print("Potential Energy: {}J".format(PE))
```

OUTPUT:

```
Windows PowerShell
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PS F:\COM.PROG.DOCS\CODE FILES\Lang\Python\Week 1> python energy_calculation.py
Enter mass: 5
Enter height: 10
Enter velocity: 2
Kinetic Energy: 10.0J
Potential Energy: 490.0J
```

Question-5

Write a program in a file temperature.py to convert temperature from Celsius to Fahrenheit. Formula –

$$C/5 = (F - 32)/9$$

CODE:

```
Celsius = float(input('Input value in C: '))
Fahernheit = (9*Celsius + 160)/5
print("{}C = {}F".format(Celsius, Fahernheit))
```

OUTPUT:

```
Windows PowerShell
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PS F:\COM.PROG.DOCS\CODE FILES\Lang\Python\Week 1> python temperature.py
Input value in C: 37.6
37.6C = 99.68F
```

Bonus Question-1

Modifying the script in Question 5, calculate the kinetic and potential energy of a ball of mass 0.1 kg half way up, thrown vertically upwards with an initial speed of 20 m/s.

CODE:

```
mass = float(input("Enter mass: "))
velocity = float(input("Enter velocity: "))
KE = mass*velocity*velocity
# KE = PE, since, the ball is already halfway upwards it's path.
print(f"Kinetic Energy: {KE}\nPotential Energy: {KE}")
```

OUTPUT:

```
Windows PowerShell
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PS F:\COM.PROG.DOCS\CODE FILES\Lang\Python\Week 1> python energy.py
Enter mass: 0.1
Enter velocity: 20
Kinetic Energy: 40.0
Potential Energy: 40.0
```

Bonus Question-2

In a file called fraction_add.py, take input of two fractions and add them. Show the output in fraction format. E.g. Take 1/2 and 3/4 as inputs. The result of addition would be 10/8. So, 10/8 should be shown as the output.

CODE:

```
frac_1, frac_2 = input("Enter two fractions: ").split()
n1, d1 = [int(i) for i in frac_1.split("/")]
n2, d2 = [int(i) for i in frac_2.split("/")]
numerator = str((n1*d2) + (n2*d1))
denominator = str(d1*d2)
print(f"{numerator}/{denominator}")
```

OUTPUT:

```
Windows PowerShell
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PS F:\COM.PROG.DOCS\CODE FILES\Lang\Python\Week 1> python fraction_add.py
Enter two fractions: 2/9 3/8
43/72
```