INFORMATICS INSTITUTE OF TECHNOLOGY

Foundation Certificate in Higher Education

Module: DOC333 Introduction to Programming in Python – P1

Module Leader : Mr. Sudharshan Welihinda

Assessment type : Individual Coursework

Assignment Number : 01

Issue Date : 15th November 2021

Hand – in – Date : 9th December 2021

Done by:

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Question 1

A group of medical students were monitoring the body temperature of a patient daily basis. Students captured 10 temperature readings in **Celsius** on a particular day.

1. Write an Algorithm to input these ten values and get the average temperature for that day. if the average temperature value is between 97° **Fahrenheit** and 99° **Fahrenheit** then display the message “Your body temperature is normal…”. If it is more than 100.4° **Fahrenheit,** then display the message “You have a fever caused by an infection or illness…”.
2. Convert the above algorithm (written in part (1)) to a Python program to output the desired results.

Problem understanding

While the captured body temperature readings are given by the User/Students on a particular day, it is required to develop an algorithm and a python program to calculate the average body temperature of a patient for that day. Students must input ten captured temperature readings in Celsius. After getting the average temperature in Celsius, convert the average temperature to Fahrenheit. If the average temperature is between 97 - and 99 - degrees Fahrenheit, display the message "Your body temperature is normal.". Else if the temperature exceeds 100.4° Fahrenheit, display the message "You have a fever caused by an infection or disease.".

Note :

This program is written with an assumption that an average temperature which is below 97 or between 100 and 100.3 degrees Celsius is an invalid result since this question is based on two Circumstances.

Algorithm

Start

1. Initializing the Variables.
2. Ask for the body temperature reading input.
3. Repeat Step 3 by 9 times.
4. Calculate the average temperature for the day by adding the 10 readings taken in Steps 3 and 4 and get the average temperature by dividing it by 10.
5. Display the average temperature in Celsius.
6. Convert the average temperature to Fahrenheit and display the result.
7. If the average temperature is greater than or equal to 97 and less than or equal to 99 degrees Fahrenheit, display “Your body temperature is normal.”.
8. If the average temperature is greater than 100.4 degrees Fahrenheit, display “You have a fever caused by an infection or disease.”.
9. Else display “Unconvincing average body temperature.”.

Stop

Python Code

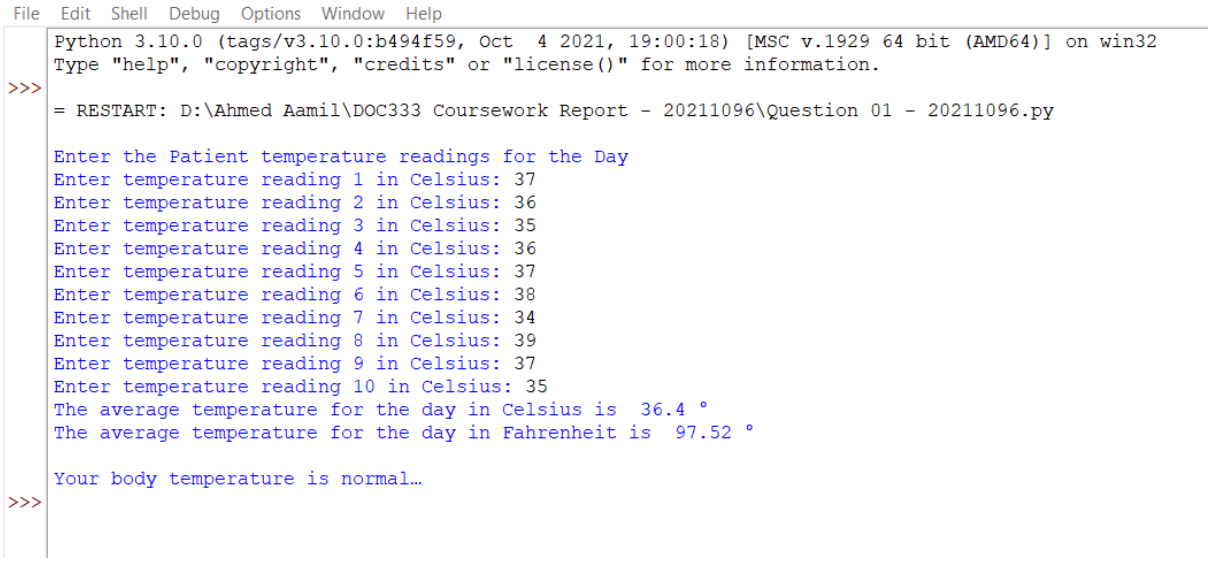
```
#START

#Initializing the variables
Patient_Temp = 0
Sum_Temp = 0
TempAvg = 0 #Average temperature for the day in Celsius.
TempAvg2 = 0 #Average temperature for the day in Fahrenheit.
Count_Read = 1 #Number of readings in particular day.
#Get 10 temperature reading inputs from the patient.
print ("\nEnter the Patient temperature readings for the Day")
while (Count_Read <= 10) :
    Patient_Temp = float(input(f"Enter temperature reading {Count_Read} in Celsius: "))
    Sum_Temp += Patient_Temp #Adding the total temperature readings taken from the patient
    Count_Read += 1
#Calculate the average temperature and display the result.
TempAvg = Sum_Temp/10
print ("The average temperature for the day in Celsius is ", TempAvg,'°')
#Convert the average temperature to Fahrenheit display the result.
TempAvg2 = (TempAvg * 9/5) + 32
print ("The average temperature for the day in Fahrenheit is ", round(TempAvg2, 2), '°')
#If the average temperature value is between 97.0 Fahrenheit and 99.0 Fahrenheit then display "Your body temperature is normal…".
if TempAvg2 >= 97.00 and TempAvg2 <= 99.00 :
    print ("\nYour body temperature is normal…")
#If the average is more than 100.4 Fahrenheit then display "You have a fever caused by an infection or illness…".
elif TempAvg2 >= 100.4 :
    print ("\nYou have a fever caused by an infection or illness…")
else:
    print ("\nUnconvincing average body temperature.")

#STOP
```

Table of the Test Cases

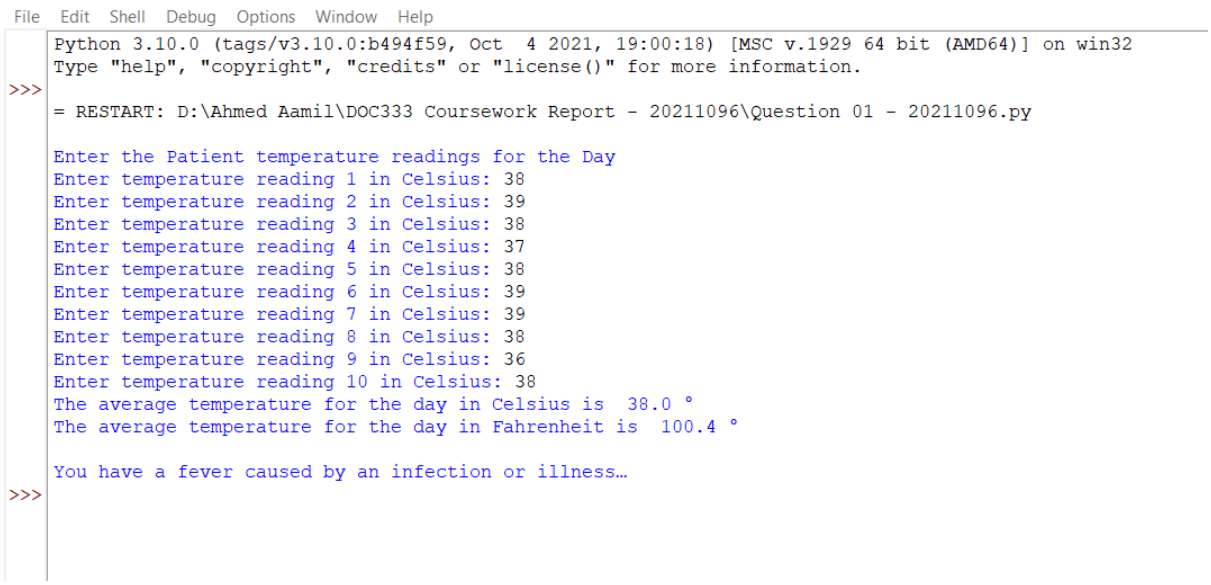
Test Case #	Body Temperature Readings in Celsius	Average Body Temperature		Expected Result	Actual Result	Pass/ Fail
		°C	°F			
1	37, 36, 35, 36, 37, 38, 34, 39, 37, 35	36.4	97.52	Your body temperature is normal…	Your body temperature is normal…	Pass
2	38, 39, 38, 37, 38, 39, 39, 38, 36, 38	38.0	100.4	You have a fever caused by an infection or illness…	You have a fever caused by an infection or illness…	Pass
3	36, 35, 34, 35, 37, 37, 35, 38, 34, 36	35.7	96.26	Unconvincing average body temperature.	Unconvincing average body temperature.	Pass
4	39, 38, 40, 41, 28.8, 37.4, 34, 32, 38, 39	36.72	98.1	Your body temperature is normal…	Your body temperature is normal…	Pass
5	39, 37.8, 39, 38, 38, 39, 37, 38.4, 36, 37	37.92	100.26	Unconvincing average body temperature.	Unconvincing average body temperature.	Pass
6	44, 45, 38, 42, 39.9 40, 43, 43, 39, 45.1	41.9	107.42	You have a fever caused by an infection or illness…	You have a fever caused by an infection or illness…	Pass

Screenshots of the Test Cases

Test Case 1



Test Case 2



Test Case 3

```
File  Edit  Shell  Debug  Options  Window  Help
Python 3.10.0 (tags/v3.10.0:b494f59, Oct  4 2021, 19:00:18) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: D:\Ahmed Aamil\DOC333 Coursework Report - 20211096\Question 01 - 20211096.py

Enter the Patient temperature readings for the Day
Enter temperature reading 1 in Celsius: 36
Enter temperature reading 2 in Celsius: 35
Enter temperature reading 3 in Celsius: 34
Enter temperature reading 4 in Celsius: 35
Enter temperature reading 5 in Celsius: 37
Enter temperature reading 6 in Celsius: 37
Enter temperature reading 7 in Celsius: 35
Enter temperature reading 8 in Celsius: 38
Enter temperature reading 9 in Celsius: 34
Enter temperature reading 10 in Celsius: 36
The average temperature for the day in Celsius is  35.7 °
The average temperature for the day in Fahrenheit is  96.26 °

Unconvincing average body temperature.
>>>
```

Test Case 4

```
File  Edit  Shell  Debug  Options  Window  Help
Python 3.10.0 (tags/v3.10.0:b494f59, Oct  4 2021, 19:00:18) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: D:\Ahmed Aamil\DOC333 Coursework Report - 20211096\Question 01 - 20211096.py

Enter the Patient temperature readings for the Day
Enter temperature reading 1 in Celsius: 39
Enter temperature reading 2 in Celsius: 38
Enter temperature reading 3 in Celsius: 40
Enter temperature reading 4 in Celsius: 41
Enter temperature reading 5 in Celsius: 28.8
Enter temperature reading 6 in Celsius: 37.4
Enter temperature reading 7 in Celsius: 34
Enter temperature reading 8 in Celsius: 32
Enter temperature reading 9 in Celsius: 38
Enter temperature reading 10 in Celsius: 39
The average temperature for the day in Celsius is  36.720000000000006 °
The average temperature for the day in Fahrenheit is  98.1 °

Your body temperature is normal…
>>>
```

Test Case 5

```
File  Edit  Shell  Debug  Options  Window  Help
Python 3.10.0 (tags/v3.10.0:b494f59, Oct  4 2021, 19:00:18) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: D:\Ahmed Aamil\DOC333 Coursework Report - 20211096\Question 01 - 20211096.py

Enter the Patient temperature readings for the Day
Enter temperature reading 1 in Celsius: 39
Enter temperature reading 2 in Celsius: 37.8
Enter temperature reading 3 in Celsius: 39
Enter temperature reading 4 in Celsius: 38
Enter temperature reading 5 in Celsius: 38
Enter temperature reading 6 in Celsius: 39
Enter temperature reading 7 in Celsius: 37
Enter temperature reading 8 in Celsius: 38.4
Enter temperature reading 9 in Celsius: 36
Enter temperature reading 10 in Celsius: 37
The average temperature for the day in Celsius is  37.92 °
The average temperature for the day in Fahrenheit is  100.26 °

Unconvincing average body temperature.
>>>
```

Test Case 6

```
File  Edit  Shell  Debug  Options  Window  Help
Python 3.10.0 (tags/v3.10.0:b494f59, Oct  4 2021, 19:00:18) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: D:\Ahmed Aamil\DOC333 Coursework Report - 20211096\Question 01 - 20211096.py

Enter the Patient temperature readings for the Day
Enter temperature reading 1 in Celsius: 44
Enter temperature reading 2 in Celsius: 45
Enter temperature reading 3 in Celsius: 38
Enter temperature reading 4 in Celsius: 42
Enter temperature reading 5 in Celsius: 39.9
Enter temperature reading 6 in Celsius: 40
Enter temperature reading 7 in Celsius: 43
Enter temperature reading 8 in Celsius: 43
Enter temperature reading 9 in Celsius: 39
Enter temperature reading 10 in Celsius: 45.1
The average temperature for the day in Celsius is  41.9 °
The average temperature for the day in Fahrenheit is  107.42 °

You have a fever caused by an infection or illness…
>>>
```

Question 2

Write a Python program to check whether a given date is a valid date or not and to output the following,

- If the date is valid then the message “Date is Valid” otherwise the message “Date is Invalid”.
- If the date is a valid date, then the next date.

Problem understanding

It is required to write a python program to check whether a given date is a valid date or not valid and if the date is valid then it is required to print **“Date is Valid”** otherwise printing as **“Date is Invalid”.** And if the given date is valid, it is needed to display the incremented date (Next date). The user must input Day, month, and year separately and these inputs should have to be in integer values.

Python Code

```
#START

#Initializing the variables.
Year = 0
Month = 0
Day = 0
Total_Days = 0

#Get Year input
Year = int(input("Insert the year: "))
#Get Month input
Month = int(input("Insert the Month: "))
#Get Date input
Day = int(input("Insert the Date: "))

#Assigning the Total days in a month.
#If Month contains 31 days,
if Month == 1 or Month == 3 or Month == 5 or Month == 7 or Month == 8 or Month == 10
or Month == 12 :
    Total_Days = 31

#If Month contains 30 days,
elif Month == 4 or Month == 6 or Month == 9 or Month == 11 :
    Total_Days = 30
```

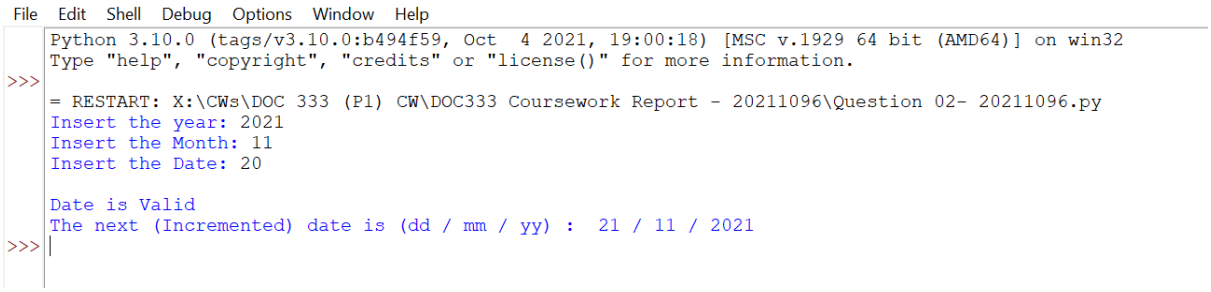
```
#If the Year is a leap year,
#A leap year is divisible by four and the century year is completely divisible by 400 would that be a leap year.

elif Year % 4 == 0 and Year % 100!= 0 or Year % 400 == 0 :
    Total_Days = 29

else:
    Total_Days = 28

#Conditions for Valid or Invalid date output and printing the next Incremented date if the user input date is Valid.
if Year<1 or Year>9999 :
    print ("\nDate is invalid")
    print ("Check the input range")

elif Month<1 or Month>12 :
    print ("\nDate is invalid")
    print ("Check the input range")

elif Day<1 or Day> Total_Days :
    print ("\nDate is invalid")
    print ("Check the input range")

#Display the Next date (Incrementing the date),
elif Day == 31 and Month==12 :
    Day = 1
    Month = 1
    Year += 1
    print ("\nDate is Valid")
    print ("The next (Incremented) date is (dd / mm / yy) : ", Day,"/",Month,"/",Year)

elif Month !=12 and Day == Total_Days :
    Day = 1
    Month += 1
    print ("\nDate is Valid")
    print ("The next (Incremented) date is (dd / mm / yy) : ", Day,"/",Month,"/",Year)

else:
    Day +=1
    print ("\nDate is Valid")
    print ("The next (Incremented) date is (dd / mm / yy) : ", Day,"/",Month,"/",Year)

#END
```

Table of the Test Cases

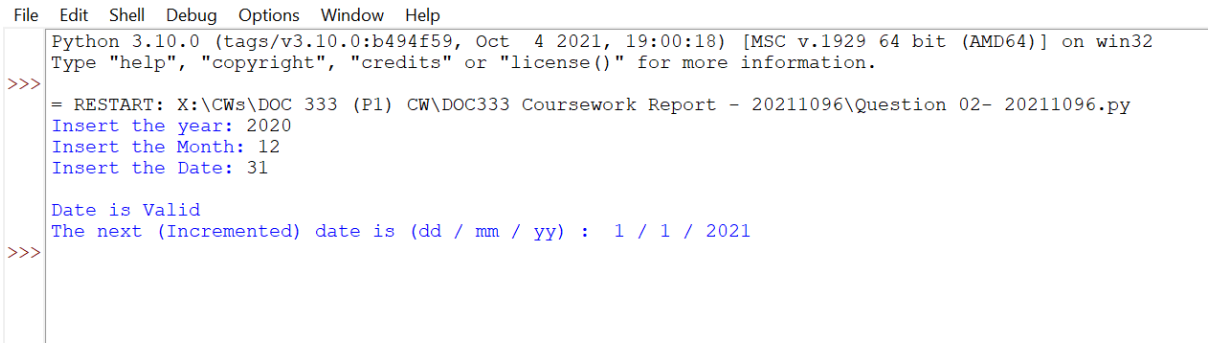
Test Case #	Insert the Year	Insert the Month	Insert the Date	Valid or Invalid Output	Next Date
1	2021	11	20	Date is Valid	21 **/** 11 **/** 2021
2	2020	12	31	Date is Valid	01 **/** 01 **/** 2021
3	2021	02	28	Date is Valid	01 **/** 03 **/** 2021
4	2021	02	30	Date is invalid	-
5	2019	06	31	Date is invalid	-
6	2018	14	25	Date is invalid	-

Screenshots of the Test Cases

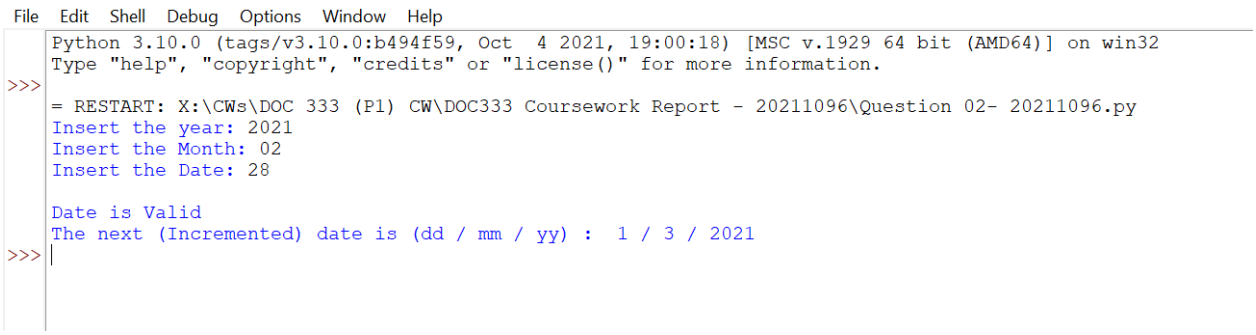
Test Case 1



Test Case 2



Test Case 3



Test Case 4

```
File  Edit  Shell  Debug  Options  Window  Help
Python 3.10.0 (tags/v3.10.0:b494f59, Oct  4 2021, 19:00:18) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: X:\CWs\DOC 333 (P1) CW\DOC333 Coursework Report - 20211096\Question 02- 20211096.py
Insert the year: 2021
Insert the Month: 2
Insert the Date: 30

Date is invalid
Check the input range
>>>
```

Test Case 5

```
File  Edit  Shell  Debug  Options  Window  Help
Python 3.10.0 (tags/v3.10.0:b494f59, Oct  4 2021, 19:00:18) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: X:\CWs\DOC 333 (P1) CW\DOC333 Coursework Report - 20211096\Question 02- 20211096.py
Insert the year: 2019
Insert the Month: 6
Insert the Date: 31

Date is invalid
Check the input range
>>>
```

Test Case 6

```
File  Edit  Shell  Debug  Options  Window  Help
Python 3.10.0 (tags/v3.10.0:b494f59, Oct  4 2021, 19:00:18) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: X:\CWs\DOC 333 (P1) CW\DOC333 Coursework Report - 20211096\Question 02- 20211096.py
Insert the year: 2018
Insert the Month: 14
Insert the Date: 25

Date is invalid
Check the input range
>>>
```

End of Coursework