Problem Solving Using Python and R Lab

Lab Manual with Student Lab Record

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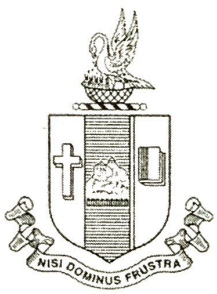

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Course Title Problem Solving using python and R Lab

Certified that this is the bonafide record of work done by me during **Odd / Even** Semester of **2020 – 2021** and submitted for the Practical Examination on _____

Staff In-Charge **Head of the Department**

Examiners

1. _____

2. _____

Grade Sheet

Roll No	205229119	Name	Maheshvaran. S
Year	1	Semester	1
		Instructor Name	Janani Selvaraj

Lab	Activity	Grade	Sign/Date
1	Python Basics and Conditions		
2	Python Loops		
3	Python Functions and Modules		
4	Python String Processing		
5	List Processing in Python		
6	Python File Processing		
7	Dictionaries in Python		
8	Python Regular Expressions		
9	Object Oriented Bank in Python		
10	Implementation of Map, Filter and Reduce Functions		
11	Retrieving Data from Web and Parsing		
12	Database Programming Using Sqlite3		
13	2D and 3D Data Visualization Using Seaborn		
14	Animated Data Visualization Using R		
15	Dashboard Visualization Using Tableau		
16	Concurrent Programming in Python		

Problem Solving Using Python and R Lab

Lab1. Python Basics and Conditions

Question1. Write a program in Python to input length and breadth of a rectangle and print the area and perimeter of it.

- Test you code with atleast 2 test cases

Question2. Write a program, which accepts annual basic salary of an employee and calculates and displays the Income tax as per the following rules.

- If Basic is less than Rs. 1,50,000/-, then Tax = 0.
- If Basic is from Rs.1,50,000/- to Rs. 3,00,000/-, then tax is 20%.
- If Basic is greater than Rs.3,00,000/-, then tax is 30%.
- Print name, annual income and tax.
- Write test cases to validate all conditions

Question:1

```
L = int(input("Length : "))
b = int(input("Breadth : "))
area = l*b
perimeter = 2*(l+b)
print("Area of Rectangle : ",area)
print("perimeter of Rectangle : ", perimeter)
```

Question : 2

```
e_name = input("Employee Name: ")
Salary = float(input("your Annual Basic Salary: "))
if( salary < 150000):
    tax = 0
    print("No taxable Amount")
    print("your Annual Income: ", netSalary)
```

```
elif (Salary < 300000):
    tax = 0.2 * Salary
    netSalary = Salary - tax
    Print ("Your Tax Amount: ", tax)
    Print ("your Annual Income: ", netSalary)

elif (salary > 300000);
    tax = 0.3 * Salary
    netSalary = Salary - tax
    Print ("Your Tax Amount: ", tax)
    Print ("Your Annual Income: ", netSalary)
```

Question 3:

```
name_item1 = str(input ("enter the item1: "))
quantity_1 = int(input("enter the Quantity1: "))
rate_1 = int(input ("enter the rate1: "))
```

Then the same code with different item & Quatity and then rate for eg: item2, quantity2, rate2.

```
amount = (quantity_1 * rate_1) + (quantity_2 * rate_2) +
         (quantity_3 * rate_3)
price = amount.

if amount > 2000:
    print ("Discount 20%....")
    discount = (amount * 20)/100
    price = discount
```

Question3. Write a program to accept quantity and rate for three (3) items. Compute the total sales amount. Also compute and print the discount as follows:

- Amount > Rs. 2000/- : 20% discount
- Amount between Rs. 1500/- to Rs.1999/- :15% discount
- Amount between Rs. 1000/- to Rs.1499/- 8 % discount

- Compute final amount to be paid.
- Print name, rate and quantity of 3 items. Then print total sales amount, total discount and final amount to be paid to shop.
- Write 3 test cases to validate all conditions

```
elif amount > 1500 and amount < 1999:
    print ("Discount 15% ....")
    discount = (amount * 15)/100
    price -= discount
elif amount > 1000 and amount < 1499:
    print ("Discount 8% ....")
    discount = (amount * 8)/100
    price -= discount
print ("\n total amount: ", amount)
print ("\n total discount: ", discount)
print ("\n final price to be paid by customer: ",
                                    price)
```

Question4. Evaluate the expressions using Pen and Paper first and then print the value.

- X1=(11+31+23+8+7+5)/((1-(1/2)-(1/20)))
- X2=(((10*8)+8-((7//5)%(5**4)))&3)|(2<<1)

$X1 = (11+31+23+8+7+5) / ((1-(1/2)-(1/20)))$

$= (85)/((1-(0.5)-(0.05)))$

$= (85)/(0.45)$

$= 188.888888889$ //

$X2 = (((10*8)+8-((7//5)\%(5**4)))\&3)|(2<<1)$

$= (((80)+8-(1)\%(3125)))\&3)|(4)$

$= ((87)\&3)|(4) \Rightarrow (3)|(4) \Rightarrow 7$ //

Question:5

```
name = str(input("Enter your Name: "))
Subject_1 = float(input("Please enter Subject 1: "))
Subject_2 = float(input("please enter Subject 2: "))
Subject_3 = float(input("please enter subject 3: "))

total = int(subject_1 + subject_2 + Subject_3)
average = total / 3
percentage = (total / 300) * 100

if (percentage >= 80):
    print("\nCongratulation!", name, "you secured a total", total
          "and your class is: 1st class")
elseif (percentage >=60 and percentage <=80)
    print ("\nCongratulation!", name, "you secured a total", total
          "and your class is: 2nd class")
else if (percentage >=40 and percentage <= 59):
    print("\nCongratulation!", name, "you secured a total", total
          "and your class is: pass class")

else:
    print("you are fail")
```

Question: 6

```
n = int(input("enter the number \n"))

if n>0:
    print("number is positive \n")
    if n%.2 ==0:
     print("number is even \n")
     else:
      print("number is odd \n")
```

Question5. Write a program to accept name, marks for three subjects and find the total marks secured, average and also display the class obtained.

- Class I – above 80%
- Class II – 60% to 80%
- Pass class – 40% to 59% and
- Fail otherwise

Print a message as "Congratulations << your name>>, you secured a total of <<total marks>>, and Your class is <<class>>"
Test you code with atleast 2 test cases

Question6:

```
elif n<0:
    print("number is negative \n")
if n%2==0:
    print("number is even \n")
else:
    print("number is odd \n")
else:
    print("number is zero \n")
```

Question6. Read a number from keyboard. Print whether it is odd number, even number, positive number, negative number or zero. Also, print if its ASCII value represents a lower case or upper case letter or digit.

Write 8 test cases to validate odd, even, positive, negative, zero, lower case, upper case and digit input types

```
print("ASCII values \n")
if n>=65 and n<=91:
    print("represents uppercase letter \n")
elif n>=97 and n<=122:
    print("represents lowercase letter \n")
elif n>=48 and n<=57:
    print("represents DIGIT \n")
val = chr(n)
print('the value', val)
char = str(input())
print(ord(char))
n=100
chr(n)
```

Question: 6

=

```
char = str(input("Enter a single number or a letter \n"))
if (ord(char) >= 65 and ord(char) <= 90):
    print("It is an uppercase letters")
elif (ord(char) >= 97 and ord(char) <= 122):
    print("It is an lowercase letters")
else:
    (ord(char) >= 48 and ord(char) <= 57)
    print("It is a Digit")
```

Question7. Version Control using Git and GitHub

Read and apply version control features in your code:
https://ocw.mit.edu/ans7870/6/6.005/s16/classes/05-version-control/