+2 COMPUTER SCIENCE PRACTICAL HAND BOOK

Instructions:

1. Eight exercises from Python and Two from MySQL are practiced in the practical classes
2. In Practical exams, the question paper will have two questions with internal choice.
3. One question should be chosen from the list of internal choice
4. Distribution of Marks as follows

Duration of Practical: 3 Hrs **Maximum Marks: 20**

I. Internal Assessment: **5 Marks**

Record Book 5 Marks

II. External Assessment: **15 Marks**

(a) Program coding 10 Marks

(b) Execution & Output 5 Marks

Total	**20 Marks**

INDEX

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QUESTION:

Write a program to calculate the factorial of the given number using for loop (Don't use build-in function factorial).

1 a) CALCULATE FACTORIAL

AIM:

To write a program for calculating the factorial of the given number using for loop.

CODING:

```
num = int(input("Enter a number:"))
fact=1
for i in range(1,num+1):
        fact=fact*i
print("Factorial of" , num," is ",fact)
```

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SAMPLE OUTPUT:

Enter a number:5

Factorial of 5 is 120

RESULT:

Thus, the program for calculating factorial of given number using for loop has been created and executed successfully.

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QUESTION:

Write a program to sum the series: $1/1 + 2^2/2 + 3^3/3 + \ldots + n^n/n$.

1 b) SUM OF SERIES

AIM:

To write a program to sum the series: $1/1 + 2^2/2 + 3^3/3 + \ldots + n^n/n$.

CODING:

```
n=int(input("Enter a value of n: "))
s=0
for i in range(1,n+1):
    a=(i**i)/i
    s=s+a
print ("The sum of the series is ", s)
```


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SAMPLE OUTPUT:

Enter a value of n: 4

The sum of the series is 76.0

RESULT:

Thus, the program for sum of series has been created and executed successfully.

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QUESTION:

Write a program to using functions to check whether a number is odd or even.

2 a) ODD OR EVEN

AIM:

To write a program using functions for checking whether a number is odd or even.

CODING:

```
def oddeven(a):
   if(a%2==0):
         return “Even”
   else:
         return “Odd”
num = int (input("Enter a number: "))
print("The given number is",oddeven(num))
```

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SAMPLE OUTPUT 1:

Enter a number: 5
The given number is Odd

SAMPLE OUTPUT 2:

Enter a number: 6
The given number is Even

RESULT:

Thus, the program using functions for checking whether a number is odd or even has been created and executed successfully.

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2 b) REVERSE THE STRING

QUESTION:

Write a program to create a mirror of given string. For example, “wel” = “lew“. (Don’t use string slice with stride operation).

AIM:

To write a program for creating a mirror of given string.

CODING:

```
def rev(str1):
    str2='    '
    for i in str2:
        str2= i + str2
    return str2
word=input("\n Enter a String: ")
print("\n The mirror image of the given string is:" , rev(word))
```

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SAMPLE OUTPUT:

Enter a String: Computer

The mirror image of the given string is: retupmoC

RESULT:

Thus, the program Reverse the string has been created and executed successfully.

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3. GENERATE VALUES AND REMOVE ODD NUMBERS

QUESTION:

Write a program to generate values from 1 to 10 and then remove all the odd numbers from the list.

AIM:

To write a program for generating values from 1 to 10 and then removing all the odd numbers from the list.

CODING:

```
num=list(range(1,11))
print("Numbers from 1 to 10...\n ", num)
for i in num:
    if(i%2==1):
        num.remove(i)
print("The values after removed odd numbers...\n", num)
```

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SAMPLE OUTPUT:

Numbers from 1 to 10...
[1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
The values after removed odd numbers...
[2, 4, 6, 8, 10]

RESULT:

Thus, the program for generating values from 1 to 10 and then removing all odd numbers from the list has been created and executed successfully.

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4. GENERATE PRIME NUMBERS AND SET OPERATIONS

QUESTION:

Write a Program that generates a set of prime numbers and another set of odd numbers. Display the result of union, intersection, difference and symmetric difference operations.

AIM:

To write a program for generating a set of prime numbers and another set of odd numbers and displaying the result of set operations.

CODING:

```
odd=set(range(1,10,2))
primes=set()
for i in range(2,10):
    for j in range(2,i):
        if (i%j==0):
            break
    else:
        primes.add(i)
print("Odd: ",odd)
print("Prime: ",primes)
print("Union: ",odd.union(primes))
print("Intersection: ",odd.intersection(primes))
print("Difference: ",odd.difference(primes))
print("Symmetric Difference: ",odd.symmetric_difference(primes))
```

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SAMPLE OUTPUT :

Odd: {1, 3, 5, 7, 9}

Prime: {2, 3, 5, 7}

Union: {1, 2, 3, 5, 7, 9}

Intersection: {3, 5, 7}

Difference: {1, 9}

Symmetric Difference: {1, 2, 9}

RESULT:

Thus, the program for generating a set of prime numbers and odd numbers and displaying the result of set operations has been created and executed successfully.

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5. DISPLAY STRING ELEMENTS – USING CLASS

QUESTION:

Write a program to accept a string and print the number of uppercase, lowercase, vowels, consonants and spaces in the given string using Class.

AIM:

To write a program for accepting a string and printing the number of uppercase, lowercase, vowels, consonants and spaces in the given string using Class.

CODING:

```
class String:
    def __init__(self):
        self.upper=0
        self.lower=0
        self.vowel=0
        self.consonant=0
        self.space=0
        self.string=" "
    def getstr(self):
        self.string=str(input("Enter a String: "))
    def count(self):
        for ch in self.string:
            if(ch.isupper()):
                self.upper+=1
            if(ch.islower()):
                self.lower+=1
            if(ch in ('AEIOUaeiou')):
                self.vowel+=1
            if(ch==" "):
                self.space+=1
        self.consonant=self.upper+self.lower-self.vowel
```

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SAMPLE OUTPUT:

Enter a String: Computer Science

The given String contains...

2 Uppercase

13 Lowercase

6 vowels

9 consonants

1 Spaces

```
    def display(self):
        print("The given String contains...")
        print("%d Uppercase"%self.upper)
        print("%d Lowercase"%self.lower)
        print("%d vowels"%self.vowel)
        print("%d consonants"%self.consonant)
        print("%d Spaces"%self.space)
S=String()
S.getstr()
S.count()
S.display()
```

RESULT:

Thus, the program Display string elements using class has been created and executed successfully.

6. MYSQL – EMPLOYEE TABLE

QUESTION:

Create an Employee Table with the fields Empno, Empname, Desig, Dept, Age and Place. Enter five records into the table

- Add two more records to the table.
- Modify the table structure by adding one more field namely date of joining.
- Check for Null value in doj of any record.
- List the employees who joined after 2018/01/01.

AIM:

To create SQL queries for creating a table and perform adding records, modifying table structure, checking null values and selecting records using where clause.

SQL QUERIES AND OUTPUT:

i) Creating Table Employee:

```
mysql> create table emp(Empno integer(4) primary key, Empname varchar(20),
Desig Varchar(15), Dept varchar(15), Age integer(2), Place varchar(15));
```

ii) Viewing Table Structure:

```
mysql> desc emp;
+----------+-------------+------+-----+---------+---------+
| Field    | Type        | Null | Key | Default | Extra   |
+----------+-------------+------+-----+---------+---------+
| Empno    | int(4)      | NO   | PRI | NULL    |         |
| Empname  | varchar(20) | YES  |     | NULL    |         |
| Desig    | varchar(15) | YES  |     | NULL    |         |
| Dept     | varchar(15) | YES  |     | NULL    |         |
| Age      | int(2)      | YES  |     | NULL    |         |
| Place    | varchar(15) | YES  |     | NULL    |         |
+----------+-------------+------+-----+---------+---------+
```

iii) Inserting Data into Table:

```
mysql> insert into emp values(101,'Aalayam','Officer','Accounts',45,'Salem');
mysql> insert into emp values(102,'Annamalai','Manager','Admin',32,'Erode');
mysql> insert into emp values(103,'Kumar','Clerk','Accounts',33,'Ambathur');
mysql> insert into emp values(104,'Madhesh','Manager','Admin',28,'Anna Nagar');
mysql> insert into emp values(105,'Basha','Officer','Accounts',31,'Anna Nagar');
```

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iv) Select all the records:

```
mysql> select * from emp;
+-----+----------+---------+----------+-----+----------+
| Empno | Empname | Desig | Dept | Age | Place |
+-----+----------+---------+----------+-----+----------+
| 101 | Aalayam | Officer | Accounts | 45 | Salem |
| 102 | Annamalai | Manager | Admin | 32 | Erode |
| 103 | Kumar | Clerk | Accounts | 33 | Ambathur |
| 104 | Madhesh | Manager | Admin | 28 | Anna Nagar |
| 105 | Basha | Officer | Accounts | 31 | Anna Nagar |
+-----+----------+---------+----------+-----+----------+
```

v) Adding two more records:

```
mysql> insert into emp values(106,'Ashok','Manager','Accounts',42,'Erode');
mysql> insert into emp values(107,'Suresh','Officer','Admin',34,'Salem');
mysql> select * from emp;
+-----+----------+---------+----------+-----+----------+
| Empno | Empname | Desig | Dept | Age | Place |
+-----+----------+---------+----------+-----+----------+
| 101 | Aalayam | Officer | Accounts | 45 | Salem |
| 102 | Annamalai | Manager | Admin | 32 | Erode |
| 103 | Kumar | Clerk | Accounts | 33 | Ambathur |
| 104 | Madhesh | Manager | Admin | 28 | Anna Nagar |
| 105 | Basha | Officer | Accounts | 31 | Anna Nagar |
| 106 | Ashok | Manager | Accounts | 42 | Erode |
| 107 | Suresh | Officer | Admin | 34 | Salem |
+-----+----------+---------+----------+-----+----------+
```

vi) Adding one more field in Table:

```
mysql> Alter table emp add (doj date);
mysql> desc emp;
+---------+-----------+------+-----+---------+---------+
| Field   | Type      | Null | Key | Default | Extra   |
+---------+-----------+------+-----+---------+---------+
| Empno   | int(4)    | NO   | PRI | NULL    |         |
| Empname | varchar(20) | YES |     | NULL    |         |
| Desig   | varchar(15) | YES |     | NULL    |         |
| Dept    | varchar(15) | YES |     | NULL    |         |
| Age     | int(2)    | YES  |     | NULL    |         |
| Place   | varchar(15) | YES |     | NULL    |         |
| doj     | date      | YES  |     | NULL    |         |
+---------+-----------+------+-----+---------+---------+
```

vii) Inserting date of joining to each employee:

```
mysql> update emp set doj='2015-01-01' where empno=101;
mysql> update emp set doj='2015-06-01' where empno=102;
mysql> update emp set doj='2016-01-01' where empno=103;
mysql> update emp set doj='2016-06-01' where empno=104;
mysql> update emp set doj='2018-01-01' where empno=105;
mysql> update emp set doj='2018-06-01' where empno=106;
mysql> update emp set doj='2019-06-01' where empno=107;
mysql> select * from emp;
+-------+---------+---------+---------+-----+---------+------------+
| Empno | Empname | Desig   | Dept    | Age | Place   | doj        |
+-------+---------+---------+---------+-----+---------+------------+
|  101  | Aalayam | Officer | Accounts |  45 | Salem   | 2015-01-01 |
|  102  | Annamalai | Manager | Admin |  32 | Erode   | 2015-06-01 |
|  103  | Kumar   | Clerk   | Accounts |  33 | Ambathur | 2016-01-01 |
|  104  | Madhesh | Manager | Admin |  28 | Anna Nagar | 2016-06-01 |
|  105  | Basha   | Officer | Accounts |  31 | Anna Nagar | 2018-01-01 |
|  106  | Ashok   | Manager | Accounts |  42 | Erode   | 2018-06-01 |
|  107  | Suresh  | Officer | Admin |  34 | Salem   | 2019-01-01 |
+-------+---------+---------+---------+-----+---------+------------+
```


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viii) Checking null value in doj:

mysql> select * from emp where doj is null;

Empty set

ix) List the employee who joined after 2018-01-01:

mysql> select * from emp where doj > '2018-01-01';

Empno	Empname	Desig	Dept	Age	Place	doj
106	Ashok	Manager	Accounts	42	Erode	2018-06-01
107	Suresh	Officer	Admin	34	Salem	2019-01-01

RESULT:

Thus, the Queries for Employee Table using MySQL has been created and executed successfully.

7. MYSQL - STUDENT TABLE

QUESTION:

Create Student table with following fields and enter data as given in the table below

Field	Type	Size
Reg_No	char	5
Sname	varchar	15
Age	int	2
Dept	varchar	10
Class	char	3

Data to be entered

Reg_No	Sname	Age	Dept	Class
M1001	Harish	19	ME	ME1
M1002	Akash	20	ME	ME2
C1001	Sneha	20	CSE	CS1
C1002	Lithya	19	CSE	CS2
E1001	Ravi	20	ECE	EC1
E1002	Leena	21	EEE	EE1
E1003	Rose	20	ECE	EC2

Then, Query the followings:

i) List the students whose department is “CSE”.
ii) List all the students of age 20 and more in ME department.
iii) List the students department wise.
iv) Modify the class ME2 to ME1.
v) Check for the uniqueness of Register no.

AIM:

To create SQL queries for given student table and perform some queries.

SQL QUERIES AND OUTPUT:

1) Creating Table – Student:

```
mysql> create table student(Reg_No char(5), Sname varchar(15), Age integer(2),
Dept varchar(10), Class char(3));
```

View Table Structure:

```
mysql> desc student;
+----------+-----------------+------+-------+----------+--------+
| Field    | Type            | Null | Key | Default | Extra |
+----------+-----------------+------+-------+----------+--------+
| Reg_No | char(5)       | YES |       | NULL   |        |
| Sname  | varchar(15) | YES |       | NULL   |        |
| Age      | int(2)          | YES |       | NULL   |        |
| Dept     | varchar(10)  | YES |       | NULL   |        |
| Class    | char(3)       | YES |       | NULL   |        |
+----------+-----------------+------+-------+----------+--------+
```

2) Inserting Data into table:

```
mysql> insert into student values('M1001','Harish',19,'ME','ME1');
mysql> insert into student values('M1002','Akash',20,'ME','ME2');
mysql> insert into student values('C1001','Sneha',20,'CSE','CS1');
mysql> insert into student values('C1002','Lithya',19,'CSE','CS2');
mysql> insert into student values('E1001','Ravi',20,'ECE','EC1');
mysql> insert into student values('E1002','Leena',21,'EEE','EE1');
mysql> insert into student values('E1003','Rose',20,'ECE','EC2');
```


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View all records:

```
mysql> select * from student;
+----------+----------+------+--------+-------+
| Reg_No | Sname | Age |Dept | Class|
+----------+----------+------+--------+-------+
| M1001  | Harish  |  19 | ME   | ME1  |
| M1002  | Akash  |  20 | ME   | ME2  |
| C1001  | Sneha  |  20 | CSE  | CS1  |
| C1002  | Lithya  |  19 | CSE  | CS2  |
| E1001  | Ravi  |  20 | ECE  | EC1  |
| E1002  | Leena  |  21 | EEE  | EE1  |
| E1003  | Rose  |  20 | ECE  | EC2  |
+----------+----------+-------+-------+---------+
```

3) Other Queries:

i) List the students whose department is "CSE":

```
mysql> select * from student where Dept='CSE';
+----------+----------+------+--------+-------+
| Reg_No | Sname | Age |Dept | Class|
+----------+----------+------+--------+-------+
| C1001  | Sneha  |  20 | CSE  | CS1  |
| C1002  | Lithya  |  19 | CSE  | CS2  |
+----------+----------+-------+-------+---------+
```

ii) List all the students of age 20 and more in ME department:

```
mysql> select * from student where Age>=20 and Dept='ME';
+----------+----------+------+--------+-------+
| Reg_No | Sname | Age |Dept | Class|
+----------+----------+------+--------+-------+
| M1002  | Akash  |  20 | ME   | ME2  |
+----------+----------+-------+-------+---------+
```


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iii) List the students department wise:

```
mysql> select * from student group by Dept order by Sname;
+----------+----------+------+--------+-------+
| Reg_No | Sname | Age |Dept | Class|
+----------+----------+------+--------+-------+
| M1001  | Harish |  19 | ME   | ME1  |
| E1002  | Leena  |  21 | EEE  | EE1  |
| E1001  | Ravi   |  20 | ECE  | EC1  |
| C1001  | Sneha  |  20 | CSE  | CS1  |
+----------+----------+------+--------+-------+
```

iv) Modify the class ME2 to ME1:

```
mysql> update student set class='ME1' where Class='ME2';
mysql> select * from student;
+----------+----------+------+--------+-------+
| Reg_No | Sname | Age |Dept | Class|
+----------+----------+------+--------+-------+
| M1001  | Harish |  19 | ME   | ME1  |
| M1002  | Akash  |  20 | ME   | ME1  |
| C1001  | Sneha  |  20 | CSE  | CS1  |
| C1002  | Lithya |  19 | CSE  | CS2  |
| E1001  | Ravi   |  20 | ECE  | EC1  |
| E1002  | Leena  |  21 | EEE  | EE1  |
| E1003  | Rose   |  20 | ECE  | EC2  |
+----------+----------+------+--------+-------+
```

v) Check for the uniqueness of Register no.:

```
mysql> select distinct Reg_No from student;
+------------+
| Reg_No |
+------------+
| M1001  |
| M1002  |
| C1001  |
| C1002  |
| E1001  |
| E1002  |
| E1003  |
+-----------+
```

RESULT:

Thus, the queries for student table using MySQL has been created and executed successfully.

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8. PYTHON WITH CSV

QUESTION:

Write a program using python to get 10 players name and their score. Write the input in a csv file. Accept a player name using python. Read the csv file to display the name and the score. If the player name is not found give an appropriate message.

AIM:

To write a program using python for getting 10 players name and their score, writing the input in a csv file, accepting a player name using python, reading the csv file to display the name and the score, If the player name is not found giving an appropriate message.

CODING:

```
import csv

with open('c:\\pyprg\\player.csv','w') as f:

    w = csv.writer(f)

    n=1

    while(n<=10):

        name=input("Player Name: ")

        score=int(input("Score: "))

        w.writerow([name,score])

        n+=1

print("Player File created")

f.close()
```

SAMPLE OUTPUT:

```
Player Name: Dhoni
Score: 183
Player Name: Sachin
Score: 200
Player Name: Sehwag
Score: 219
Player Name: Rohit
Score: 264
Player Name: Virat
Score: 183
Player Name: Ganguly
Score: 183
Player Name: Dravid
Score: 153
Player Name: MS Dhoni
Score: 224
Player Name: Karthik
Score: 79
Player Name: Ashwin
Score: 65
Player File created
Enter the name to be searched: Dhoni
['Dhoni', '183']
```

```
searchname=input("Enter the name to be searched: ")
f=open('c:\\pyprg\\player.csv','r')
reader=csv.reader(f)
lst=[]
for row in reader:
    lst.append(row)
    q=0
for row in lst:
    if searchname in row:
        print(row)
        q+=1
    if(q==0):
        print("String not found")
f.close()
```

RESULT:

Thus, the program Python with CSV has been created and executed successfully.

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9. PYTHON WITH SQL

QUESTION:

Create a SQL table using python and accept 10 names and age. sort in descending order of age and display.

AIM:

To create a SQL table using python and accepting 10 names, age and sorting in descending order of age and displaying the result.

CODING:

```
import sqlite3

connection =sqlite3.connect("info.db")

cursor=connection.cursor()

#cursor.execute(drop table student)

cursor.execute("create table student(name,age)")

print("Enter 10 students name and their age respectively:")

for i in range(10):

    who=[input("Enter Name: ")]

    age=[int(input("Enter Age: "))]

    n=len(who)

    for i in range(n):

        cursor.execute("insert into student values(?,?)",(who[i],age[i]))

cursor.execute("select * from student order by age desc")

print("Displaying All the Records From student Table in Descending order of age:")

print(*cursor.fetchall(),sep='\n')
```

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SAMPLE OUTPUT:

```
Enter 10 students name and their age respectively:
Enter Name: Aalayam
Enter Age: 25
Enter Name: Annamalai
Enter Age: 27
Enter Name: Kumar
Enter Age: 24
Enter Name: Madhesh
Enter Age: 25
Enter Name: Guna
Enter Age: 25
Enter Name: Sheik Basha
Enter Age: 26
Enter Name: Ashok
Enter Age: 27
Enter Name: Suresh
Enter Age: 29
Enter Name: Babu
Enter Age: 30
Enter Name: Pradish
Enter Age: 26
Displaying All the Records From student Table in Descending order of age:
('Babu', 30)
('Suresh', 29)
('Annamalai', 27)
('Ashok', 27)
('Sheik Basha', 26)
('Pradish', 26)
('Aalayam', 25)
('Madhesh', 25)
('Guna', 25)
('Kumar', 24)
```

RESULT:

Thus, the program Python with MySQL has been created and executed successfully.

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QUESTION:

Write a program to get five marks using list and display the marks in pie chart.

10. PYTHON GRAPHICS WITH PIP

AIM:

To write a program for getting five marks using list and displaying the marks in pie chart.

CODING:

```
import matplotlib.pyplot as plt

marks=[]

i=0

subjects=["Tamil","English","Maths","Physics","Computer"]

while i<5:

    marks.append(int(input("Enter Mark = ")))

    i+=1

for j in range(len(marks)):

    print("{}.{} Mark ={}".format(j+1,subjects[j],marks[j]))

plt.pie(marks,labels=subjects,autopct="%.2f")

plt.axes().set_aspect("equal")

plt.show()
```


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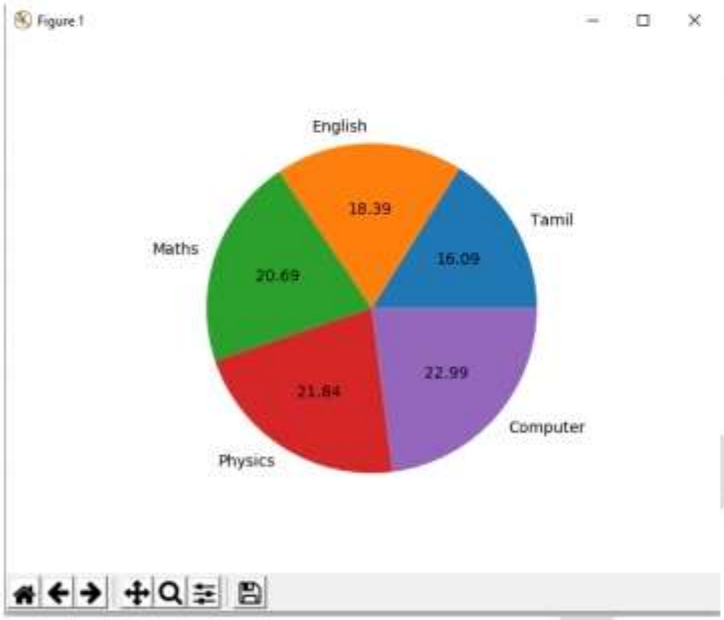
SAMPLE OUTPUT:

Enter Mark = 70
Enter Mark = 80
Enter Mark = 90
Enter Mark = 95
Enter Mark = 100
1.Tamil Mark =70
2.English Mark =80
3.Maths Mark =90
4.Physics Mark =95
5.Computer Mark =100



RESULT:

Thus, the program Python Graphics with Pip has been created and executed successfully.

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