1. Write down the commands and output to:
   i. Create the following DataFrame ‘df’ .

	name	score	attempts	qualify
a	Anastasia	12.5	1	yes
b	Dima	16.5	3	no
c	Katherine	NaN	2	yes
d	James	9.0	3	no
e	Ramesh	10.0	1	no

   ii. **Display the first 2 rows.**
   iii. Display all the names from the dataframe.
   iv. Display the total number of rows and columns of dataframe.
   SOL :

```
   import pandas as pd
import numpy as np
import sys

exam_data  = {'name': ['Anastasia', 'Dima', 'Katherine', 'James','Ramesh'],
       'score': [12.5, 16.5, np.nan, 9, 10],
       'attempts': [1, 3, 2, 3, 1],
       'qualify': ['yes', 'no', 'yes', 'no', 'no']}
labels = ['a', 'b', 'c', 'd','e']



while True:
   print("CBSE IP Practical Exam 2020")
   print("-"*60)
   print("1. Crete dataframe")
   print("2. Display the first 2 rows")
   print("3. Display all the names from the dataframe")
   print("4. Display the total number of rows and columns of dataframe")
   print("0. Exit")
   print("-"*60)
   ch=int(input("Enter your choice : "))
   print("-"*60)
   if ch==1:
      print("1.Create the DataFrame" )
      df = pd.DataFrame(exam_data , index=labels)
      print(df)
   elif ch==2:
      print("2.Display first 2 rows" )
      print(df.head(2))
   elif ch==3:
      print("3.Display all the names from the dataframe")
      print(df['name'])
```

```
elif ch==4:
    print("4. Display the total number of rows and columns of dataframe")
    total_rows=len(df.axes[0])
    total_cols=len(df.axes[1])
    print("Number of Rows: "+str(total_rows))
    print("Number of Columns: "+str(total_cols))
elif ch==0:
    sys.exit()
else:
    print("select correct option")
```

#Note here all “if” is under while. So be careful with indentations

2. Create a 1-D Numpy array by accepting data from user .
    1. Display the original array
    2. Display the values of only even ordered index.
    3. Display the values of only odd ordered index.
    4. Display the sum of all elements.

```
import numpy as np

while True:
    print("CBSE IP Practical Exam 2020")
    print("-"*60)
    print("1. Display the original array")
    print("2. Display the values of only even ordered index ")
    print("3. Display the values of only odd ordered index ")
    print("4. Display the sum of all elements")
    print("0. Exit")
    print("-"*60)
    ch=int(input("Enter your choice : "))
    print("-"*60)
    if ch==1:
        print("1. Display the original array " )
            sz=int(input('Enter Size'))
            data=eval(input('Enter Data as list'))
            arr=np.array(data)
            print(arr)      #Original array

    elif ch==2:
            print("2. Display the values of only even ordered index " )
            print(arr[1::2])  #Even index display
```

```
elif ch==3:
        print("3. Display the values of only odd ordered index ")
        print(arr[0::2])  #odd index display

elif ch==3:
        print("3. Display the Sum of all elements")
        print(arr[::].sum())  #sum of all elements

elif ch==0:
    sys.exit()
else:
    print("select correct option")
```

3. Create a 2-D Numpy array by accepting size(row,column) and data from user and carry out the following operations

1. Display the original array
2. Display the sum of even index values.
3. Display the sum of odd index values.

Solution :

```
import numpy as np

while True:
    print("CBSE IP Practical Exam 2020")
    print("-"*60)
    print("1. Display the original array")
    print("2. Display the sum of even index values")
    print("3. Display the sum of odd index values ")
    print("0. Exit")
    print("-"*60)
    ch=int(input("Enter your choice : "))
    print("-"*60)
    if ch==1:
        print("1. Display the original array " )
            r=int(input('Enter Row'))
            c=int(input('Enter Col'))
            arr=np.arange(0,r*c)
            arr=arr.reshape(r,c)
            print(arr)                  #Original array
    elif ch==2:
        print("2. Display the sum of even index values " )
        print(arr[1::2].sum())  #sum Even index
    elif ch==3:
        print("3. Display the sum of odd index values ")
        print(arr[0::2].sum())  #sum odd index
```

```
elif ch==0:
    sys.exit()
else:
    print("select correct option")
```

4. Write down the commands and output to:
   i. Create the following DataFrame 'Company'

	ITEM	COMPANY	Price
0	TV	LG	12000
1	IPAD	APPLE	10000
	AC	BPL	15000
3	TV	SONY	14000

   ii. Display the last 3 rows.
   iii. Display the maximum and minimum Price with proper label.
   iv. Display the sum of price column.

Solution :

```
import pandas as pd

while True:
    print("CBSE IP Practical Exam 2020")
    print("-"*60)
    print("1. Create the DataFrame "Company' ")
    print("2. Display the last 3 rows ")
    print("3. Display the maximum  and minimum Price with proper label ")
    print("4. Display the sum of price column")
    print("0. Exit")
    print("-"*60)
    ch=int(input("Enter your choice : "))
    print("-"*60)



    if ch==1:
        print("1. Create the DataFrame "Company' " )
        item_data  = {'item': ['TV', 'IPAD', 'AC', 'TV'],
                      'company': ['LG', 'APPLE', 'BPL', 'SONY'],
                      'price': [1000, 20000, 15000, 14000],
                     }
        company = pd.DataFrame(item_data)    #Ques.i
        print(company)
```

```
elif ch==2:
        print("2. Display the last 3 rows " )
        print(df.tail(3))    #Ques.ii

elif ch==3:
        print("3. Display the maximum  and minimum Price with proper label ")
        print("Max. Price : ")
        print(df['price'].max())    #Ques. iii
        print("Min. Price : ")
        print(df['price'].min())    #Ques. Iii

elif ch==4:
        print("4. Display the sum of price column ")
        print("SUM Price : ")
        print(df['price'].sum())    #Ques. Iv

elif ch==0:
    sys.exit()
else:
    print("select correct option")
```

5. Consider following table and write down the commands and output to:

	year	KV1	KV2
0	2014	90	100
1	2015	85	98
2	2016	80	86
3	2017	95	75
4	2018	88	80
5	2019	79	70

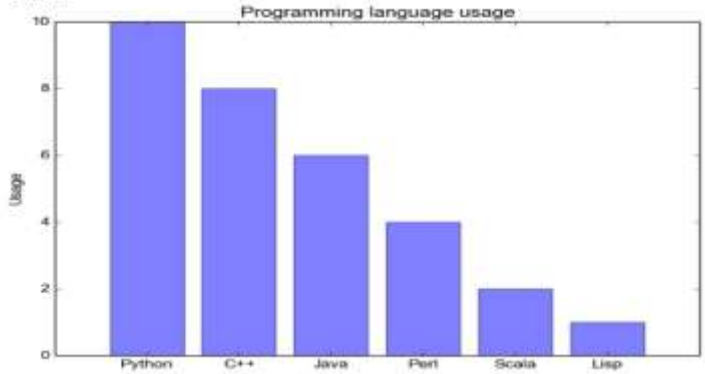
i. Create the following DataFrame ‘Result’
ii. Display the entire data frame Result.
iii.Display the Average Result of KV1
iv. Display total count of years

Solution :

```
import pandas as pd

while True:
    print("CBSE IP Practical Exam 2020")
    print("-"*60)
    print("1. Create the following DataFrame  'Result' ")
    print("2.  Display the entire data frame Result.")
    print("3. Display the Average Result of KV1")
    print("4. Display total count of years")
    print("0. Exit")
    print("-"*60)
    ch=int(input("Enter your choice : "))
    print("-"*60)
    if ch==1:
        print("1. Create the following DataFrame  'Result' " )
        exam_data =  {'year': [2014, 2015, 2016, 2017, 2018, 2019],
                      'KV1': [90, 85, 80, 95, 88, 79],
                      'KV2': [100, 98, 86, 75, 80, 70],
                      }
        result = pd.DataFrame(exam_data)   #Ques i
        print('Dataframe 'Result' created….")

    elif ch==2:
        print("2. Display the entire data frame Result " )
        print(result)                #Ques. ii

    elif ch==3:
        print("3 Display the Average Result of KV1")
        print(result['KV1'].mean())      #Ques. Iii

    elif ch==4:
        print("4 Display total count of years ")
        print(result['year'].count())    #Ques. iv

    elif ch==0:
       sys.exit()
    else:
       print("select correct option")
```

6. Write python program to draw the following bar graph as per following data :

Output:



objects = ('Python', 'C++', 'Java', 'Perl', 'Scala', 'Lisp')
performance = [10,8,6,4,2,1]

Solution :

```
import matplotlib.pyplot as plt; plt.rcdefaults()
import numpy as np
import matplotlib.pyplot as plt

objects = ('Python', 'C++', 'Java', 'Perl', 'Scala', 'Lisp')
performance = [10,8,6,4,2,1]

y_pos = np.arange(len(objects))
plt.bar(y_pos, performance)
plt.xticks(y_pos, objects)
plt.ylabel('Usage')
plt.title('Programming language usage')
plt.show()
```

#note : please learn meaning of all lines and its effects

CONNECTIVITY

1. SQL+ PYTHON connectivity Program:

TABLE : icecreamparlor

Falvourid	Flavour	Type	Price	Rating
A1	Mango	Stick	20	A
A2	Straw Berry	Cup	40	
A3	Cassata	Slice	50	B
A4	Sunde	Cup	80	
A5	Gudbud	Cup	100	A
A6	Leechi	Stick	50	

Write down the Python Menu Driven script to :

(i) Create the table "icecreamparlor" using Python.
(ii) Insert the records as per screenshot.
(iii) Display all records of Table.
(iv) Display the flavor and price whose rating is 'A'.

Solution :

```
import mysql.connector as mycon
import sys
mydb=mycon.connect(host='slab-main', db='company', user='root', passwd='root')
mycur=mydb.cursor()
while True:
   print("++++++++++++++++++++++++++++++++++")
    print("1. Create table")
    print("2. insert data")
    print("3. Display all record")
    print("4. Display by Rating")
    print("5. Exit")
   print("++++++++++++++++++++++++++++++++++")
   ch=int(input("Enter choice : "))

    if ch==1:
       sql="create table icecreamparlor \
            (Falvourid char(2), \
             Flavour varchar(20), \
             Type varchar(10), \
             Price int, \
             Rating char \
           )"
       mycur.execute(sql)
       mydb.commit()
```

```
elif ch==2:
    flg='y'
    while flg:
        flid=input("Enter Flavour ID : ")
        flav=input("Enter Flavour : ")
        tp=input("Enter Type : ")
        pr=input("Enter Price : ")
        rt=input("Enter Rating : ")
        sql='''insert into icecreamparlor
            values(%s, %s, %s, %s, %s)'''
        param=(flid, flav, tp, pr, rt)
        mycur.execute(sql,param)
        mydb.commit()
        print("Record inserted.....")
        flg=input("Want to insert more record (y/n) : ")

elif ch==3:
    sql="select * from icecreamparlor"
    mycur.execute(sql)
    data=mycur.fetchall()
    for rec in data:
        print (rec)


elif ch==4:
    rt=input("Enter Rating : ")
    sql="select * from icecreamparlor where rating=%s"
    param=(rt,)
    mycur.execute(sql,param)
    data=mycur.fetchall()
    for rec in data:
        print (rec)

elif ch==5:
     sys.exit()
```

2. SQL+ PYTHON connectivity Program:

EMPNO	ENAME	JOB	SAL
7369	SMITH	CLERK	800.00
7499	ALLEN	SALESMAN	1600.00
7521	WARD	SALESMAN	1250.00
7654	MARTIN	SALESMAN	1250.00
7844	TURNER	SALESMAN	1500.00
7934	MILLER	CLERK	1300.00

Write down the Python Menu Driven script to :

i. Create the table "Emp" using Python.
ii. Insert the records as per screenshot.
iii. Display all records of Table.
iv. Remove all the records whose job is entered by the user".

Solution :

```
import mysql.connector as mycon
import sys
mydb=mycon.connect(host='slab-main', db='company', user='root', passwd='root')
mycur=mydb.cursor()

while True:
   print("++++++++++++++++++++++++++++++++++")
   print("1. Create table")
   print("2. insert data")
   print("3. Display all record")
   print("4. Delete record job-wise")
   print("5. Exit")
   print("++++++++++++++++++++++++++++++++++")
   ch=int(input("Enter choice : "))


   if ch==1:
      sql="create table emp \                                    # here '\' is for continuation of line in python
          (empno int, \
           ename varchar(30), \
           job varchar(20), \
           sal int \
          )"

      mycur.execute(sql)
      mydb.commit()

   elif ch==2:
      flg='y'
      while flg:
```

```
            eno=input("Enter Emp No. : ")
            nm=input("Enter Emp Name : ")
            jb=input("Enter Job : ")
            sal=int(input("Enter Salary : "))

            sql='''insert into emp  values(%s, %s, %s, %s)'''
            param=(eno, nm, jb, sal)
            mycur.execute(sql,param)
            mydb.commit()
            print("Record inserted.....")
            flg=input("Want to insert more record (y/n) : ")

        elif ch==3:
           sql="select * from emp"
           mycur.execute(sql)
           data=mycur.fetchall()
           for rec in data:
              print (rec)

        elif ch==4:
           jb=input("Enter Job : ")
           sql="delete from emp where job=%s"
           param=(jb,)
           mycur.execute(sql,param)
           mydb.commit()
           print("Record Deleted.....")

        elif ch==5:
            sys.exit()
```

#Note here all “if” is under while. So be careful with indentations

3. SQL+ PYTHON connectivity Program:

```
+-------+--------+-----------+------+------------+---------+-------------+
| EMPNO  | ENAME      | JOB             |         SAL
+-------+--------+-----------+------+------------+---------+-------------+
|  7369      | SMITH        | CLERK        |       800.00  |
|  7499      | ALLEN        | SALESMAN |       1600.00 |
|  7521      | WARD         | SALESMAN |       1250.00 |
|  7654      | MARTIN     | SALESMAN  |       1250.00 |
|  7844      | TURNER     | SALESMAN  |       1500.00 |
|  7934      | MILLER     | CLERK        |       1300.00 |
+-------+--------+-----------+------+------------+---------+-------------+
```

Write down the Python Menu Driven script to :

v. Create the table “Emp” using Python.
vi. Insert the records as per screenshot.
vii. Display all records of Table.
viii. Increase & update the salary of ‘CLERK’ by 10% ”.

Solution :

```
import mysql.connector as mycon
import sys
mydb=mycon.connect(host='slab-main', db='company', user='root', passwd='root')
mycur=mydb.cursor()

while True:
   print(“++++++++++++++++++++++++++++++++++”)
   print("1. Create table")
   print("2. insert data")
   print("3. Display all record")
   print("4. Increase Salary of CLARK")
   print("5. Exit")
   print(“++++++++++++++++++++++++++++++++++”)
   ch=int(input("Enter choice : "))


   if ch==1:
      sql="create table emp \                                    # here ‘\’ is for continuation of line in python
          (empno int, \
           ename varchar(30), \
           job varchar(20), \
           sal int \
          )"

      mycur.execute(sql)
      mydb.commit()

   elif ch==2:
      flg='y'
      while flg:
         eno=input("Enter Emp No. : ")
         nm=input("Enter Emp Name : ")
         jb=input("Enter Job : ")
         sal=int(input("Enter Salary : "))

         sql='''insert into emp  values(%s, %s, %s, %s)'''
         param=(eno, nm, jb, sal)
         mycur.execute(sql,param)
         mydb.commit()
         print("Record inserted.....")
         flg=input("Want to insert more record (y/n) : ")
```

```
elif ch==3:
    sql="select * from emp"
    mycur.execute(sql)
    data=mycur.fetchall()
    for rec in data:
        print (rec)

elif ch==4:
    jb=input("Enter Job : ")
    sql="update emp set sal=sal+(sal*10/100) where job=%s"
    param=(jb,)
    mycur.execute(sql,param)
    mydb.commit()
    print("Salary Updated.....")

elif ch==5:
     sys.exit()
```

#Note here all “if” is under while. So be careful with indentations

Please do all above program in your computer and see the correct execution.