DELHI PUBLIC SCHOOL, DAMANJODI

PRACTICAL EXAMINATION 2023-24

Q1. Create an array A, in the range 1 to 20 with values 1.25 apart. Other arrays(B& C) , contains the

log values and log10 values respectively of the elements in the array A.

Write a program to create a scatter plot of first (A) vs second array (B& C) with ‘ B’ red circle markers and ‘C’ with blue triangular markers; specify the x-axis ( containing first array’s values) title as ‘Random Values’ and y-axis title as ‘Logarithm Values’. [4]

Q2. Mark is a nested list containing marks in five different subjects of three students. The subjects are ‘English’, ‘Acct’, ‘Bst’,’Ip’ and “Math’.

The list mark=[[67,87,99,56,70],[90,87,54,39,80],[56,67,78,89,90]]. Draw a bar chart taking these values and subjects. Keep the width of each bar as 0.25. Specify x label, y label, legend and title for the chart. [4]

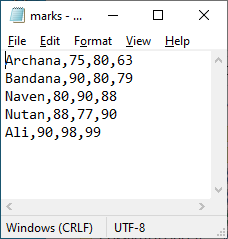
Q3. The medal tally of 5 countries are given below. Draw a bar chart with x label, y label, title and legend to represent the same. [4]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Country | Gold | Silver | Bronze | Total |
| Australia | 42 | 36 | 50 | 128 |
| Canada | 12 | 24 | 60 | 96 |
| India | 65 | 46 | 50 | 161 |
| England | 40 | 36 | 58 | 134 |
| South Africa | 40 | 50 | 46 | 136 |

Q4. Thirty students appeared a test on Mathematics. There marks are given as follows. Draw a Histogram with 20 bins. Provide title to the chart.

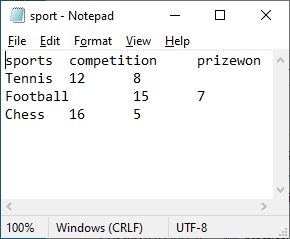
Mark=[56,78,92,67,56,78,90,45,34,56,27,58,30,40,50,60,70,80,30,40,50,60,70,70,80,45,55,65,45,65]

Q5. Dray line chart taking the values ab=[1,7,21,35,35,21,7,1] and (numpy.sin(), numpy.cos(), and numpy.tan() of ab). Apply cyan colour to sine plot line, red colour to cosine plot and black color to tangent plot line. The tangent line should be dashed. [4]



CSV

Q1. First open excel enter data as given in the csv file. Store the data in form of a csv file (Marks.csv stored in the drive). Then write python program that reads the csv file and add a column total that sores the sum of marks in three subjects. Add another column that stores average marks. Print both the data frames before and after adding these columns.

Q2. First open excel enter data as given in the csv file. Store the data in form of a csv file tab delimited (sports.csv stored in the drive). Then write python program that reads the csv file where separator is tab. Then convert the data frame to a line chart taking sports and competition columns into consideration. Take the printouts of all outputs.

Q3. Create a data frame taking the following data and then convert the data frame to a csv file and store in ‘student.csv’ file.

RollNo Name Class mark

0 23 Ajit XA 85

1 45 Archit XIIC 90

2 25 Babita XC 92

3 30 Kabita XA 85

4 32 Nandita XISC 92

Data Frame:

Q1. Write python program to create a Data Frame taking data from the given table and perform the operations (a) to (d)

|  |  |  |  |
| --- | --- | --- | --- |
| City | Population | Hospitals | Schools |
| Delhi | 10256389 | 145 | 870 |
| Mumbai | 25362984 | 208 | 1563 |
| Kolkata | 13568479 | 145 | 650 |
| Chennai | 18562495 | 200 | 748 |

1. Display no of schools and hospitals city wise.
2. Display the population and no of hospital for Delhi and Kolkata.
3. Add a column police station with the given data. {2500,2145,2396,1875}
4. Rename the column Schools to GovtSchools

Q2. Write a program to create a dataframe from a list containing dictionaries of the sales performance of four zonal offices. Zone names should be the row labels. The data ig given in the following table.

|  |  |  |  |
| --- | --- | --- | --- |
| Zone name | Target | Sales | No of employees |
| ZoneA | 750000 | 800000 | 12 |
| ZoneB | 600000 | 700000 | 15 |
| ZoneC | 850000 | 800000 | 16 |
| ZoneD | 900000 | 840000 | 13 |

1. Display Zone name and target.
2. Display the Target and No of Employees forZoneB and ZoneD.
3. Delete the columnno of employees from the dataframe.
4. Rename the row ZoneC to SectorC and ZoneD to SectorD

Q3. Create a data frame taking data from the given table.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Year1 | Year2 | Year3 |
| Qtr1 | 35000 | 42000 | 36000 |
| Qtr2 | 22000 | 32000 | 15000 |
| Qtr3 | 23000 | 42000 | 65000 |
| Qtr4 | 31000 | 40000 | 50000 |

1. Display Quarter wise total sale after showing year wise sale.
2. Display year wise total sale after showing quarter wise sale.
3. Find maximum sale in year2 and minimum sales in year3
4. Find the year for maximum sale and minimum sale in Qtr3

SQL

Q1: Using MySql create the following given table.Enter data as it is given. Then connect to the table form Python and execute the given three queries.

**Student**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Roll** | **Name** | **Class** | **Dofb** | **Mark** |
| **10** | **Parveen** | **XII-A** | **2002-10-12** | **98.5** |
| **15** | **Nikita** | **XII-B** | **2002-08-10** | **95.5** |
| **20** | **Subhradeepta** | **XII-A** | **2003-05-18** | **90.5** |
| **25** | **Yogesh Kumar** | **XII-B** | **NULL** | **73.25** |
| **30** | **Rahul Raj** | **XII-C** | **2003-01-31** | **70.25** |
| **32** | **Asutosh** | **XII\_A** | **2003-06-01** | **78.25** |

1. **Display details of the students of class XII-A.**
2. **Display Details of the students whose mark is between 80 to 95 both the limits are included.**
3. **Display Roll,Name and mark where dofb is not given.**
4. **Display details of the students whose name starts with ‘N’.**
5. **Change the column name dofb to Date\_of\_birth**
6. **Bring the column mark after Name.**

LQ2: Using MySql create the following given table. Then connect to the table form Python. Enter data as

it is given and then execute the given two queries interactively.

**Employee**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Eno** | **Name** | **Desi** | **Salary** | **Dept** |
| **235** | **Rohit** | **Manager** | **65000** | **Civil** |
| **456** | **Ayush** | **Analyst** | **70000** | **NULL** |
| **654** | **Sayoni** | **Clerk** | **56000** | **Finance** |
| **765** | **Yogesh** | **GM** | **120000** | **Finance** |
| **879** | **Om Pangi** | **Analyst** | **75000** | **Comp** |

1. **Display details of the employee those have salary between 70000 to 90000.**
2. **Display Empno, name and Designation for employees of civil department.**
3. **Increase the salary of all employees by 20 percent where salary is less than 80000.**
4. **Delete the data for Om Pangi as he has taken TC.**
5. **Display name and department but if department is NULL the show ‘new employee’**
6. Create the following tables and write the SQL commands for the following queries (i) to (vii)

on the basis of the tables **EMPLOYEE** and **DEPT**. along with the output. (5)

**EMPLOYEE**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Ecode | Ename | Sex | Grade | Gross |
| 1100 | Roshan | M | E2 | 25000 |
| 1201 | Kartik | M | E3 | 22000 |
| 1403 | Pooja | F | E4 | 25000 |
| 1500 | Rekha | F | E1 | 14000 |
| 1502 | Harseet | M | E2 | 20000 |
| 1604 | Akash | M | E3 | 21000 |
| 1506 | Sushant | M | E4 | 30000 |

**DEPT**

|  |  |  |  |
| --- | --- | --- | --- |
| Ecode | Deptno | Job | Commission |
| 1100 | 40 | Manager | 4500 |
| 1500 | 41 | Analyst |  |
| 1403 | 45 | Programmer | 10000 |
| 1502 | 25 | Sr.Clerk | 1500 |
| 1201 | 40 | Jr. Analyst |  |
| 1604 | 45 | Manager | 2000 |
| 1506 | 25 | Sr.Manager |  |

1. Display ename, job, deptno, gross for the employees those are not getting commission.
2. Create a view itax with columns ecode, ename ,job and tax for the employees whose gross is more than or equal to 25000. The tax will be calculated as 10% of the gross.
3. Display ename, gross of the employees whose gross is more than the gross of ‘Kartik’ in

descending order of name.

1. Display the content as per the following format. <Ename>”Works in the grade of”<Grade> “and earns

salary”< Gross>

1. Display the details of employee table in the descending order of Grade and ascending order of Gross.
2. Create the following tables and write the SQL commands for the following queries (i) to (v)

on the basis of the tables **FLIGHTs** and **FARES along** with the output. (5)

**FLIGHTS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| FL\_NO | STARTING\_S | ENDING\_S | NO\_FLIGHTS | NO\_STOPS |
| IC301 | MUMBAI | DELHI | 8 | 0 |
| IC799 | BANGALORE | DELHI | 2 | 1 |
| MC101 | I NDORE | MUMBAI | 8 | 3 |
| AM876 | KANPUR | KOCHI | 6 | 2 |
| MU898 | DELHI | TRIVANDRUM | 7 | 0 |
| IC701 | KANPUR | BANGALORE | 4 | 5 |
| MC202 | DELHI | AHMEDDABAD | 4 | 0 |

**FARES**

|  |  |  |  |
| --- | --- | --- | --- |
| FL\_NO | AIRLINES | FARE | TAX |
| IC301 | Indian Airlines | 9400 | 10 |
| IC799 | Jet airlines | 8600 | 8 |
| MC101 | Deccan Airlines | 7540 | 7 |
| AM876 | Indian Airlines | 5460 | 3 |
| MU898 | Indian Airlines | 9000 | 6 |
| IC701 | Sahara | 8500 | 6 |
| MC202 | Jet airlines | 6500 | 5 |

1. Display FL\_NO and NO\_FLIGHTS from ‘KANPUR’ to ‘BANGALORE’ .
2. Display FL\_NO, AIRLINES and total fare (FARE+TAX\*FARE/100) for the flights that have fare more than 6000.
3. Display maximum and minimum fare according to the airlines if number of flights are more than or equals to 2.
4. Increase the fare of Indian Airlines by RS 500 in case of tax is less than 5.
5. Display FL\_NO, Starting\_S ,Ending\_S and Airlines whose fare is less than that of IC701.

Answer:

import matplotlib.pyplot as plt

import numpy as np

ab=[1,7,21,35,35,21,7,1]

s=np.sin(ab)

c=np.cos(ab)

t=np.tan(ab)

plt.plot(ab,s,'c',label='sine')

plt.plot(ab,c,'r',label='cosine')

plt.plot(ab,t,'k',linestyle='dashed',label='tan')

plt.legend(loc=1)

plt.title('sine,cos and tan chart')

plt.xlabel('Values')

plt.ylabel('sin,cos,tan')

Q1.

import matplotlib.pyplot as plt

import numpy as np

A=np.arange(1,20,1.25)

B=np.log(A)

C=np.log10(A)

plt.plot(A,B,'ro',label='log')

plt.plot(A,C,'b^',label='log10')

plt.legend(loc=2)

plt.title('log and log10')

plt.xlabel('random values')

plt.ylabel('log and log10 values')

Q3.

import matplotlib.pyplot as plt

import numpy as np

subject=['English','Acct','Bst','Ip','Math']

mark=[[67,87,99,56,70],[90,87,54,39,80],[56,67,78,89,90]]

x=np.arange(len(subject))

plt.bar(x,mark[0],color='r',width=0.25,label='student1')

plt.bar(x+0.25,mark[1],color='b',width=0.25,label='student2')

plt.bar(x+0.5,mark[2],color='g',width=0.25,label='student3')

plt.legend(loc=2)

plt.title('Result analysis')

plt.xlabel('subject')

plt.ylabel('marks')

plt.xticks(x,subject)

Q5.

import matplotlib.pyplot as plt

import numpy as np

country=['Australi','Canada','India','England','SouthAfrica']

gold=[42,12,65,40,40]

Silver=[36,24,46,36,50]

Bronze=[50,60,50,58,46]

Total=[128,96,161,134,136]

x=np.arange(len(country))

plt.bar(x,gold,color='r',width=0.25,label='Gold')

plt.bar(x+0.25,Silver,color='b',width=0.25,label='Silver')

plt.bar(x+0.50,Bronze,color='g',width=0.25,label='Bronze')

plt.bar(x+0.75,Total,color='y',width=0.25,label='Total')

plt.legend(loc=2)

plt.title('Medal tally')

plt.xlabel('Country')

plt.ylabel('Medal')

plt.xticks(x,country)

Q5.

import matplotlib.pyplot as plt

import numpy as np

medal=['Gold','Silver','Bronze','Total']

australia=[42,36,50,128]

Canada=[12,24,60,96]

India=[65,46,50,161]

England=[40,36,58,134]

SouthAfrica=[40,50,46,136]

x=np.arange(len(medal))

plt.bar(x,australia,color='r',width=0.25,label='Australia')

plt.bar(x+0.25,Canada,color='b',width=0.25,label='Canada')

plt.bar(x+0.50,India,color='g',width=0.25,label='India')

plt.bar(x+0.75,England,color='y',width=0.25,label='England')

plt.bar(x+1.0,SouthAfrica,color='m',width=0.25,label='SouthAfrica')

plt.legend(loc=2)

plt.title('Medal tally')

plt.xlabel('Madal')

plt.ylabel('Counytry')

plt.xticks(x,medal)

**CSV**

import pandas as pd

df=pd.read\_csv("D:\\marks.csv",names=['Name','Mark1','Mark2','Mark3'])

print('Data frame taking data from the csv file')

print(df)

df['Total']=df['Mark1']+df['Mark2']+df['Mark3']

df['Average']=df['Total']/3

print(df)

Q2.

import pandas as pd

df=pd.read\_csv("D:\\sports.csv",skiprows=1,sep='\t',names=['sport','Competition','Prizeon'])

print('Data frame taking data from the csv file')

print(df)

df.plot(x='sport',y='Competition',kind='line')