PRESIDENCY UNIVERSITY

(Established under the Presidency University Act, 2013 of the Karnataka Act 41 of 2013)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LAB MANUAL

COURSE TITLE & CODE: Problem Solving Using Python & CSE 258

SEMESTER/YEAR: III /II

COURSE CREDIT STRUCTURE: 1- 0- 4-3

TABLE OF CONTENT

Ex: No. 1 **OPERATORS AND EXPRESSIONS**

Objective

To create python application which solve the following basic problem using operator and expression.

QUESTION SET

1. Axis bank calculate simple interest based on the following formula. Write a python program to read principal amount, Time (year), rate and calculate the simple interest.

   Simple interest formula

   $$SI = \frac{P \times T \times R}{100}$$

   Where,

   P is the principle amount

   T is the time and

   R is the rate

2. HDFC bank calculate the compound interest to their customers using the following formula. Write a program to input principle (amount), time and rate (P, T, R) and find Compound Interest.

   Formula to calculate compound interest annually is given by.

   $$CI = P\left(1 + \frac{R}{100}\right)^{T}$$

3. Write a program to input temperature in Centigrade and convert to Fahrenheit.

   Temperature conversion formula from degree Celsius to Fahrenheit is given by.

   $$°F = \left(°C * \frac{9}{5}\right) + 32$$

4. Metric Conversion

   Develop and test a Python program that converts pounds to grams, inches to centimeters, and

kilometers to miles. The program should allow conversions both ways. Consider the one pound equal to 453.592 gram, one inch equal to 2.54 cm and one kilometers to 0.621371 miles.

5. Write a Python program that allows the user to enter two integer values, and displays the results when each of the following arithmetic operators are applied. For example, if the user enters the values 7 and 5,the output would be,

   7 +5 = 12

   7- 2 =5

   7 * 5 = 35

   7 / 5 =1.40

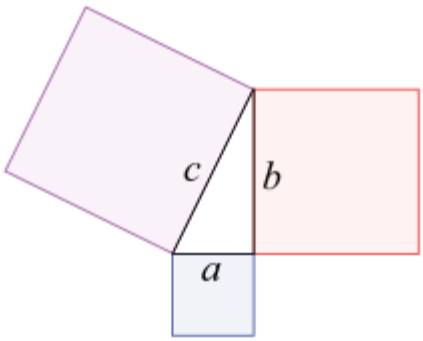
   7 // 5 =1

   7 % 5= 2

   7 ** 5 =5

6. Write a python program to read a four digit binary number one digit at a time starting #from the rightmost digit and print its decimal value.

7. Write a small script to compute the length of the hypotenuse (c) of a right triangle having sides a=133 and b=72 units (see picture below). Hint: remember the Pythagorean Theorem and use math.sqrt).



8. Price of the bike of QRide Company increasing every year. If current price is y, next year y^x, second year y^{x+1} and so on. Enter Current price and produce price after fifth year.

9. An ATM contains currency notes of 100,500, and 2000. To withdraw cash from this ATM, the user has to enter the number of notes he or she wants of each currency i.e 100,500, and 2000.Write a program to calculate the total amount withdrawn by the person from the ATM in rupees.

10. Write a python program to swap two variables without using a temporary variable.

11. Write a program to Swap two variables (without using a temporary variable and coma operator).

12. Write Program to check number is whether EVEN or ODD without using %.

13. Write a program to check if two numbers are equal or not without using arithmetic operators or comparison operators.

Ex: No. 2 **DECISION STATEMENTS**

Objective

To create python application which solve the real time problem using decision statement.

QUESTION SET-1

1. VIT university follow the absolute grading system for the CSE program, to assign grades to students at the end of course. The program must do the following:

1. Ask for a student number.
2. Ask for the student's tutorial mark.
3. Ask for the student's test mark.
4. Calculate whether the student's average so far is high enough for the student to be permitted to write the examination. If the average (mean) of the tutorial and test marks is lower than 40%, the student should automatically get an F grade, and the program should print the grade and exit without performing the following steps.
5. Ask for the student's end term examination mark.
6. Calculate the student's final mark. The tutorial and test marks should count for 25% of the final mark each, and the final examination should count for the remaining 50%.
7. Calculate and print the student's grade, according to the following table:

Weighted final score	**Final grade**
80 <= mark <= 100	A
70 <= mark < 80	B
60 <= mark < 70	C
50 <= mark < 60	D
mark < 50	E

2. Karnataka state government electricity board charges the following rates to domestic users to discourage consumption of energy. Write a program to input electricity unit and calculate total electricity bill according to the given table:

Unit	Rate of charge
1-50	Rs .50
51-100	Rs 1
101-200	Rs 2
201-300	Rs 3
Above 300	Rs 4

3. Write a program in which the user enters either 'A', 'B', or 'C'. If 'A' is entered, the program should display the word 'Apple'; if 'B' is entered, it displays 'Banana'; and if 'C' is entered, it displays 'Coconut'.

QUESTION SET-2

1. The Dog day care center charges clients based on size of the dog and the number of days per month in a client's contract. The following table shows the rates.

Size	1-10 days per month	11-31 days per month
Under 3 kilo gram	Rs12	Rs 20
3-10 Kilo gram	Rs16	Rs 24
35 Kilo gram and over	Rs19	Rs 30

Prompt the user to enter a dog's weight and number of days per month needing care, then calculate and display the total rate for the month.

2. Write a Python program in which a student enters the number of college credits earned. If the number of credits is greater than 90, 'Senior Status' is displayed; if greater than 60, 'Junior Status' is displayed; if greater than 30, 'Sophomore Status' is displayed; else, 'Freshman Status' is displayed.

3.The following table shows the HRA and DA percentage of Infosys company, Write a program to input basic salary ,Income Tax , Professional Tax of an employee and calculate its Gross salary (Gross salary=Basic Salary+HRA+DA-Income Tax –Professional Tax).

Basic Salary	HRA	DA
1-100000	20%	80%
100001-200000	25%	85%
200001-300000	30%	90%
Above 300000	35%	95%

QUESTION SET-3

1. An electricity board charges the following rates to domestic users to discourage consumption of energy. For the first 100 units – 60 Paisa per unit. For next 200 units - 80 paisa per unit. Beyond 300 units - 90 Paisa per unit. All users are charged a minimum of Rs. 50.00. If the total amount is more than Rs. 300 then an additional surcharge of 15% is added. Write a program to get the names of the users and the number of units consumed by the user and display the electricity bill for the users.

2. Presidency school has the following rules for grading system:
   a. Below 25 - F
   b. 25 to 45 - E
   c. 45 to 50 - D
   d. 50 to 60 - C
   e. 60 to 80 - B
   f. Above 80 - A
   Ask user to enter marks and print the corresponding grade.
3. Axis bank calculate compound interest based on the following table. Write a python program to read account number, principal amount, Time (year) and calculate the compound interest of the customers.

Tenure	Rate of Interest
1 year	7.30 %
2 years	7.40%
3 Years	7.55%
4 Years	8%

QUESTION SET-4

1. A library charges a fine for every book returned late. For first 5 days the fine is 50 paisa, for 6-10 days fine is one rupee and above 10 days fine is 5 rupees. If you return the book after 30 days your membership will be cancelled. Write a program to accept the number of days the member is late to return the book and display the fine or the appropriate message.

2. Presidency University is providing the DA and House rent allowance (HRA) of employee based on the following table. Write a python program to read the name, basic salary of an employee and compute the gross salary of the employee. (Gross Salary=Basic+DA+HRA).

Basic	DA	HRA
1-100000	50 %	5 %
100001-200000	60 %	10 %
200001-300000	70 %	15 %
Above 300000	80 %	20 %

3. Consider the following assessment method and Course Completion Criteria used by problem solving using python lab based theory course conducted in Presidency University.

Sl.no	Assessment type	Marks	weightage
1	Record, Viva	10	5%
2.	Continuous assessment-1	20	10%
3	Continuous assessment-2	20	10%
4	Mid term	40	20%
5	Continuous assessment-3	20	10%
6	Continuous assessment-4	30	15%
7	End term Lab and Theory examination	60	30%

Course Completion Criteria

I. Minimum attendance is 75%. Otherwise "NP". (not permitted to appear end term exam)
II. Minimum marks in continuous assessment: 40%. Otherwise "NE" (not eligible)
III. Minimum marks in end term practical and theory: 30%. Otherwise "F" grade.

The program must do the following:
Read student roll number, student's attendance percentage, student's assessment marks and check the student's attendance percentage is less than 75%, print NP grade terminate program, otherwise calculate whether the student's average so far is high enough for the student to be permitted to write the examination. If the average (mean) of all pre end term continuous assessment is lower than 40%, the student should automatically get an NE grade, and the program should print the grade and exit without performing the following steps. Ask for the student's end term examination mark. Calculate the percentage and check if it is less than 30% percentage print F grade otherwise print Student is Pass.

QUESTION SET-5

1. A certain grade of steel is graded according to the following conditions:
   (i) Hardness must be greater than 50
   (ii) Carbon content must be less than 0.7
   (iii) Tensile strength must be greater than 5600
   The grades are as follows:
   Grade is 10 if all three conditions are met
   Grade is 9 if conditions (i) and (ii) are met
   Grade is 8 if conditions (ii) and (iii) are met
   Grade is 7 if conditions (i) and (iii) are met
   Grade is 6 if only one condition is met
   Grade is 5 if none of the conditions are met
   Write a program, which will require the user to give values of hardness, carbon Content and tensile strength of the steel under consideration and output the grade of the steel.

2. A student will not be allowed to sit in exam if his/her attendance is less than 75%.
   Take following input from user
   Number of classes held
   Number of classes attended.
   And print
   Percentage of class attended
   Is student is allowed to sit in exam or not.

3. Sri Sai ram school want automate mark sheet process, Develop a program to read name, roll number, marks of five different subject. Calculate total marks and percentage and print the marks sheet according to the range of percentage given in table.

Percentage	**Class**
Percentage>=90	Distinction
Percentage>=80 && Percentage< 90	First class
Percentage>=70 && Percentage< 80	Second class
Percentage>=60 && Percentage< 70	Third Class
Percentage<60	FAIL

QUESTION SET-6

1. An Insurance company follows following rules to calculate premium.

   I. If a person's health is excellent and the person is between 25 and 35 years of age and lives in a city and is a male then the premium is Rs. 4000 and his policy amount cannot exceed Rs. 2 lakhs.

   II. If a person satisfies all the above conditions except that the sex is female then the premium is Rs. 3000 and her policy amount cannot exceed Rs. 1 lakh.

   III. If a person's health is poor and the person is between 25 and 35 years of age and lives in a village and is a male then the premium is Rs. 6000 and his policy cannot exceed Rs. 50,000.

   IV. In all other cases the person is not insured.

   Write a program to output whether the person should be insured or not, his/her premium rate and maximum amount for which he/she can be insured.

2. Apollo medical agencies providing salary to the medical representative considering the sales bonus and incentive offered to him are based on total sales. If the sales exceed or equal to 100000 follow the Category-1 else follow the category-2.

Category 1	**Category 2**
Basic=5000	Basic=4000
HRA=20% of Basic	HRA=10% of Basic
DA=110% of Basic	DA=110% of Basic
Conveyance =500	Conveyance =500
Incentive=10 % of Sales	Incentive=5% of Sales
Bonus=1000	Bonus=500

Write a program to input total sales of the month and compute the gross salary of a medical representative. (Gross salary=Basic+HRA+DA+ conveyance +incentive+bonus)

QUESTION SET-7

1. In a company, worker efficiency is determined on the basis of the time required for a worker to complete a particular job. If the time taken by the worker is between 2 – 3 hours, then the worker is said to be highly efficient. If the time required by the worker is between 3 – 4 hours, then the worker is ordered to improve speed. If the time taken is between 4 – 5 hours, the worker is given training to improve his speed, and if the time taken by the worker is more than 5 hours, then the worker has to leave the company. If the time taken by the worker is input through the keyboard, find the efficiency of the worker.

2. Mind Computer & Browsing Centre Charge the customers based on the flowing table. The owner should enter the number of hours spent on browsing and system should generate the internet browsing bill.

Hours	**Charge**
½	10
1	20
3	25
Above 3	50

3. Classify a person as Overweight, Normal or Underweight based on the Body Mass Index Range.

Category	BMI (kg/m^2)	
	From	**To**
Underweight		18.5
Normal Range	18.5	23
Overweight—At Risk	23	25
Overweight—Moderately Obese	25	30
Overweight—Severely Obese	30	

Write python script to read BMI from the user and print the classification of person.

QUESTION SET-8

1. Write a python script to calculate when you're going to die. Assume that the average life expectancy is 70 and then adjust this according to the following recorded variables:

Are you male or female? Females get an extra 4 years.

Are you a smoker? Add 5 years if not, subtract 5 years if you are.

How often (per week) do you exercise? Subtract 3 years if never, add one year for each exercise session.

Do you eat fatty food? Add 3 years if not.

Calculate the life expectancy of a male non-smoker who exercises twice a week, drinks 10 units of alcohol a week and eats fatty food.

2. Indian government tax the salaried citizen based on the following table.

Income tax slabs for resident Individual below 60 years of age

Taxable income slabs	Income tax rates and cess
Up to Rs 2.5 lakh	Nil
Rs 2,50,001 to Rs 5,00,000	5% of (Total income minus Rs 2,50,000)
Rs 5,00,001 to Rs 10,00,000	Rs 12,500 + 20% of (Total income minus Rs 5,00,000)
Rs 10,00,001 and above	Rs 1,12,500 + 30% of (Total income minus Rs 10,00,000)

Income tax slabs for resident individual between 60 and 80 years of age (Senior Citizen)

Taxable income slabs	Income tax rates and cess
Up to Rs 3 lakh	Nil
Rs 3,00,001 to Rs 5,00,000	5% of (Total income minus Rs 3,00,000)
Rs 5,00,001 to Rs 10,00,000	Rs 10,000 + 20% of (Total income minus Rs 5,00,000)
Rs 10,00,001 and above	Rs 1,10,000 + 30% of (Total income minus Rs 10,00,000)

Income tax slabs for resident individual above 80 years of age (Super Senior Citizen)

Taxable income slabs	Income tax rates and cess
Up to Rs 5 lakh	Nil
Rs 5,00,001 to Rs 10,00,000	20% of (Total income minus Rs 5,00,000)
Rs 10,00,001 and above	Rs 1,00,000 + 30% of (Total income minus Rs 10,00,000)

Write a program to read the name of citizen, age, salary and compute the income tax of citizen.

QUESTION SET-9

1. Consider the following assessment method and Course Completion Criteria used by problem solving using python lab based theory course conducted in Presidency University.

Sl.no	**Assessment type**	**Marks**	**weightage**
1	Record, Viva	10	5%
2.	Continuous assessment-1	20	10%
3	Continuous assessment-2	20	10%
4	Mid term	40	20%
5	Continuous assessment-3	20	10%
6	Continuous assessment-4	30	15%
8	End term Lab and Theory examination	60	30%

Course Completion Criteria

i. Minimum attendance is 75%. Otherwise “NP”. (not permitted to appear end term exam)
ii. Minimum marks in continuous assessment: 40%. Otherwise “NE” (not eligible)
iii. Minimum marks in end term practical and theory: 30%. Otherwise “F” grade.

The program must do the following:
Read student roll number, student's attendance percentage, student's assessment marks and check the student's attendance percentage is less than 75%, print NP grade terminate program, otherwise calculate whether the student's average so far is high enough for the student to be permitted to write the examination. If the average (mean) of all pre end term continuous assessment is lower than 40%, the student should automatically get an NE grade, and the program should print the grade and exit without performing the following steps.
Ask for the student's end term examination mark. Calculate the percentage and check if it is less than 30% percentage print F grade otherwise print Student is talented.

2. Write a program to prompt a day of the wee. If the entered day of the week is between 1 and 7 the display the respective name of the day. (Assume day start with Monday).

3. The consistency of a soil can be determined by field tests in which the soil is evaluated in place, or by lab tests on samples that have been carefully handled to avoid remolding. The unconfined compression test is often used as an indication of consistency. In practice, the relative terms soft, medium, stiff, very stiff, and hard are applied to describe consistency. Get the shear strength and Classify soil into different consistencies Soft, Medium Stiff, Stiff Very Stiff.

Shear Strength	**Consistency**
Less than 24500	Soft
24500-49000	Medium Stiff
49000-98000	Stiff
98000-196000	Very Stiff
Greater than 196000	Hard

QUESTION SET-10

1. Presidency University is providing the DA and House rent allowance (HRA) of employee based on the following table. Write a python program to read the name, basic salary of an employee and compute the gross salary of the employee. (Gross Salary=Basic+DA+HRA).

Basic	DA	HRA
1-100000	70 %	5 %
100001-200000	75 %	10 %
200001-300000	85 %	13%
Above 300000	90 %	15 %

2. Presidency university library charges a fine for every book returned late. For first 5 days the fine is 50 paisa, for 6-10 days fine is one rupee and above 10 days fine is 5 rupees. If you return the book after 30 days your membership will be cancelled. Write a program to accept the name, number of days the member is late to return the book and display the fine or the appropriate message.

3. Suppose data giving the living areas and prices of houses from Bangalore are the following. Based on the budget of a customer find the Living area he/she can afford. If it does not fit in his/her budget ask the customer to enter another budget and so on.

Living area	**Price**
2100	30 lakhs
1500	20 Lakhs
3100	40 Lakhs

Ex: No. 3 **LOOPING STATEMENTS**

Objective

To create python application which solve the following problem using looping statement.

QUESTION SET-1

1. Develop Guess number that prompt user to enter a number. If the number is equal 99 print "congratulations". If the number is less than 99 print enter again and aim higher else print enter again lower number. The program should print enter again a lower number. The program should run until the user guesses the correct the number that is 99.
2. Write a program to read number of row from the users and print inverted half pyramid using * as shown below.

```
* * * * *

* * * *

* * *

* *

*
```

QUESTION SET-2

1. Write a program to read number of row from the users and print half pyramid as using numbers as shown in figure below.

```
1

1 2

1 2 3

1 2 3 4

1  2 3 4 5
```

2. Develop python program to read an integer. If it is positive then display corresponding binary representations of that number. The user must enter 999 to stop. Incase user enter negative number then ignore that input and ask users to renter any different number.

QUESTION SET-3

1. Implement a simple calculator with a menu. Display the following options to the user, prompt for a selection, and carry out the requested action (e.g. prompt for two numbers and add them). After each operation, return the user to the menu. Exit the program when the user selects 0. If the user enters a number which is not in the menu, ignore the input and redisplay the menu. You can assume that the user will enter a valid integer:

-- Calculator Menu --
0. Quit
1. Add two numbers
2. Subtract two numbers
3. Multiply two numbers
4. Divide two numbers

2. Write a program to read number of row from the users and print pattern as follows.

```
1
2*2
3*3*3
4*4*4*4
4*4*4*4
3*3*3
2*2
1
```

QUESTION SET-4

1. Develop a program which uses a while loop to sum the squares of integers (starting from 1) until the total exceeds 200. Print the final total.
2. Write a program to read number of row from the users and print full pyramid as using * as shown in figure below.

```
        *
      * * *
    * * * * *
  * * * * * * *
* * * * * * * * *
```

QUESTION SET-5

1. Write a program containing a pair of nested while loops that displays the integer values 1–100, ten numbers per row, with the columns aligned as shown below,

```
1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30
.
.
91  2 93 94 95 96 97 98 99 100
```

2. Write a program to read number of row from the users and print Inverted full pyramid using * as shown in figure below.

```
* * * * * * * * *
 * * * * * * *
  * * * * *
   * * *
    *
```

QUESTION SET-6

1. Write a program that reads an unspecified number of integers, determines how many positive and negative values have been read, and computes the total and average of the input values (not counting zeros). Your program ends with the input 0. Display the average as a floating-point number.

2. Write a program to read number of row from the users and print pattern using * as shown in figure below.

```
* * * * *
 * * * *
  * * *
   * *
    *
```

QUESTION SET-7

1. Write a program to read number of row from the users and print characters follows.

```
A
B B
C C C
D D D D
E E E E E
```

2. Develop a program which repeatedly prompts the user for an integer. If the integer is even, print the integer. If the integer is odd, don't print anything. Exit the program if the user enters the integer 99.

QUESTION SET-8

1. Develop program which add two numbers without using arithmetic operators.
2. Write a program to read number of row from the users and print pattern using * as shown in figure Below.

```
    *
   * *
  * * *
 * * * *
* * * * *
 * * * *
  * * *
   * *
    *
```

QUESTION SET-9

1. Write a program to read number of row from the users and print pattern using * as shown in figure Below.

```
*
* *
* * *
* * * *
```

2. Develop program to find smallest of three number without using comparison operator.

QUESTION SET-10

1. Develop a program to subtract two numbers without using arithmetic operator.
2. Write a program to read number of row from the users and print pattern using * as shown in figure Below

```
* * * * *
 * * * *
  * * *
   * *
    *
```

Ex: No. 4 **FUNCTIONS**

Objective

To create python application which solve the problem using function.

QUESTION SET-1

1. Create a function called average, which takes five numbers as parameters and compute average of the numbers.
Call this function with five floats.
Call this function with five integers.
Call this function with four integer and one float.

2. Suppose the Ganga retail store management wants to provide discount for all bill amounts as mentioned below. Assume bill amount will be always greater than 0.

Regular Customer

Bill Amount	Discount %
>=1000	5
>=500 and <1000	2
>0 and <500	1

New Customer

Bill Amount	Discount %
>=1000	3
>=500 and <1000	1
>0 and <500	.5

Write a function which accept Bill amount and Type of customer and generate the Discount for the given customers.

QUESTION SET-2

1. Write a function called calculator. It should take the following parameters: two numbers, an arithmetic operation (which can be addition, subtraction, multiplication or division and is addition by default), and an output format (which can be integer or floating point, and is floating point by default). Division should be floating-point division.
The function should perform the requested operation on the two input numbers, and return a result.

2. Presidency university, a student's is allowed entry into the classroom only if he clears the following checks

i. ID card Check

ii. Dress Code Check

iii. Fees Paid

Student ()
In Student () function, initialize the student Id and student name, Fees_amount, Dress_code and invoke the functions IDCard_check (), Fees_Paid () and DressCode_check() by passing required arguments. Refer the table below for values of arguments.

Variable	Value
Student_id	1001
Student_name	Jim
Dress_Code	Formal
Fees_Amount	50000

If all values of IDCard_check (), Fees_Paid () and DressCode_check () are true,
Display Student_id and Student_name
Display "Allow Students to enter the class!"
else
Display Student_id and Student_name
Display "Detain Students for Re-checking!"

Note:
IDCard_check() Function should check whether the students is having ID card or not if students is having ID card return true otherwise return false.

Fees_Paid () Function should check whether the students is Paid 50% of the university fee or not. If student is paid 50% fee return true otherwise return false.

DressCode_check () Function should check whether the students is wearing Formal dress or not. If the students is wearing formal dress return true otherwise return false.

QUESTION SET-3

1. Write a function called showNumbers that takes a parameter called limit. It should print all the numbers between 0 and limit with a label to identify the even and odd numbers. For example, if the limit is 3, it should print:
0 EVEN
1 ODD
2 EVEN
3 ODD

2. S.K.B Retail Store sells different varieties of Furniture to the customers. The list of furniture's available and its cost list are given below:

Furniture	Sofa set	Dining table	T.V. Stand	Cupboard
Cost in Rs.	20,000	8,500	4,599	13,920

If the required furniture is available in list of furniture's listed above and Quantity purchased is greater than zero, only then bill amount should be calculated. In case of invalid values for furniture required by the customer and quantity purchased, consider bill amount to be 0.
Write a Python function to calculate and display the bill amount to be paid by the customer based on the furniture bought and quantity purchased.

QUESTION SET-4

1. Write a function that returns the sum of multiples of 3 and 5 between 0 and limit (parameter). For example, if limit is 20, it should return the sum of 3, 5, 6, 9, 10, 12, 15, 18, and 20.
2. Cafe Coffee Day Billing Assistants wants to print the billing details of five customers in given format.

```
##########################################################################
                        Cafe Coffee Day     Bill
##########################################################################

Customers ID: 101
Bill amount: 600
Discount: 60
Final amount to be paid: Rs. 540
##########################################################################
                                Thank You
##########################################################################
```

Write function to print the bill for following five customers ID.

Customers ID	**Bill amount**	**Type of customers**	**Discount**
101	600	Regular	10%
102	700	New	5%
103	70	Regular	10%
104	600	New	5%
105	300	Regular	10%

QUESTION SET-5

1. S.T Johns Hospital automate the salary process for their store employee. Create a Function called ComputeGrossSalary function that should take basic pay, D.A, H.R.A, Income Tax, and Professional Tax. Compute gross salary of the given employee.

Note: D.A = 40% of basic pay
H.R.A = 25% of basic pay
Gross Pay = basic pay + D.A. + H.R.A-Income tax-Professional Tax

2. Write a program to define function dec_bin (num) to convert the decimal number into its equivalent binary number.

QUESTION SET-6

1**.** At an airport, a traveler is allowed entry into the flight only if he clears the following checks

i.Baggage Check
ii.Immigration Check
iii.Security Check

check_baggage (baggage_amount)

Check if baggage_amount is greater than or equal to 0 and less than or equal to 40.

If baggage_amount is VALID
return TRUE
else
Return FALSE

check_immigration (expiry_year)

Check if expiry_year is greater than or equal to 2001 and less than or equal to 2025.

If expiry_year is VALID
return TRUE
else
return FALSE

check_security (noc_status):
If noc_status is TRUE
return TRUE
else
return FALSE

traveler ()
In traveler () function, initialize the traveler Id and traveler name and invoke the functions check_baggage (), check_immigration () and check_security () by passing required arguments. Refer the table below for values of arguments.

Variable	Value
traveler_id	1001
traveler_name	Rani
baggageAmount	35
expiryDate	2019
nocStatus	true

If all values of check_baggage (), check_immigration () and check_security () are true,
Display traveler_id and traveler_name
Display "Allow Traveler to fly!"
else
Display traveler_id and traveler_name
Display "Detain Traveler for Re-checking!"

QUESTION SET-7

1. A 5-digit positive integer is entered through the keyboard, write a function to calculate sum of digits of the 5-digit number:
2.Write a function called printStatus that is passed status code'S",'M','D', or 'U' and return the string 'separated','Married','Divorced' ,or 'Unmarried', respectively. In case an inappropriate letter is passed print an appropriate message.

QUESTION SET-8

1. A positive integer is entered through the keyboard, write a function to find the binary equivalent of this number.
2. Suppose the Raja retail store management now wants to provide discount for all bill amounts as mentioned below. Customers can be considered to be valid, if their customer id is between 101 and 1000(both inclusive).For valid customers, discount must be provided as per the table given below:

Bill Amount	Discount %
>=500	10

Assume for all other cases, discount is 0%.

Note: Display appropriate error messages wherever applicable.

Write a Python Function to implement the same.

QUESTION SET-9

1. Presidency University HR wants print Pay Slip for 5 employee. The format of pay slip is given below.

……..
Presidency University Bengaluru
Pay Slip
……

Employee id: PUNIV01001

Gross Salary: 80000

……

Write function to print the pay slip following five employee.

Employee ID	**Gross salary**
PUNIV01001	80000
PUNIV01002	400000
PUNIV01003	900000
PUNIV01004	600000
PUNIV01005	700000

2. The finance department of an OLA company wants to calculate the monthly net pay of one of its employee by finding the income tax to be paid (in Indian Rupees) and the net salary after the income tax deduction. The employee should pay income tax if his monthly gross salary is more than Rs. 10,000 (Indian Rupees) and the percentage of income tax should be considered as 20% of the gross salary. Display the employee id, basic salary, allowances, gross pay, income tax and net pay.

Note:

Employee Id must be considered as 1001,
Basic salary of the employee must be considered as Rs.15000.00
and Allowances must be considered as Rs.6000.00

Refer below for the formulae to be used.

Monthly Gross Salary = Basic Salary + Allowances
Net Salary = Gross Salary – Income Tax

Write a Python Function to implement the same.

QUESTION SET-10

1. Cafe Coffee Day Billing Assistants wants to print the billing details of five customers in given format.

```
##############################################################################
                        Cafe Coffee Day     Bill
##############################################################################
Customer Name: Raja
Customers ID: 101
Final amount to be paid: Rs. 6000
##############################################################################
                                Thank You
##############################################################################
```

Write function to print the bill for following five customers ID.

Customer name	**Customers ID**	**Bill amount**
Raja	101	600
Elango	102	700
Babu	103	70
Kumar	104	600
Gaja	105	300

2. If a five-digit number is input through the keyboard, write a function to print a new number by adding one to each of its digits. For example if the number that is input is 12391 then the output should be displayed as 23402.

Ex: No. 5 **STRINGS**

Objective

To create python application which solve the problem using string.

QUESTION SET-1

1. Given a string containing both upper and lower case letters. Write a Python program to count the number of repeated characters and display the maximum count of a character along with the character.

Sample Input: ABaBCbG
Output:
2A
3B (three times B is repeated)
2C
1G

2. Assuming that we have some email addresses in the "username@companyname.com" format, please write program to print the user name of a given email address. Both user names and company names are composed of letters only.

Example:
If the following email address is given as input to the program:
john@google.com
Then, the output of the program should be:
john

3. String characters balance Test
We'll say that a String s1 and s2 is balanced if all the chars in the string1 are there in s2. Characters position doesn't matter.

For Example: –
stringBalanceCheck(yn, Pynative) = True

QUESTION SET-2

1. Consider 2 strings string1 and string2 and display the merged_string as the output. The merged_string should be capital letters from both the strings in the order they appear. Note: Each character should be checked if it is a capital letter and then it should be merged.

Sample Input:

string1: I Like C

string2: Mary Likes Python
merged_string: ILCMLP

2. Given the string, we have to remove the ith indexed character from the string. In any string, indexing always start from 0.

Input: Peter
i = 4
Output: Pete

3. Given a string, return the sum and average of the digits that appear in the string, ignoring all other Characters

For Example: –
SumAndAverage ("English = 78 Science = 83 Math = 68 History = 65") = sum 294 Percentage is 73.5

QUESTION SET-3

1. Given a string, the task is to remove duplicates from it.

Input: Removing duplicate words is a text editing tool used to remove duplicate words from documents.

Output: Removing duplicate words is a text editing tool used to remove from documents.

2. You are given a number A which contains only digits 0's and 1's. Your task is to make all digits same by just flipping one digit (i.e. 0 to 1 or 1 to 0) only. If it is possible to make all the digits same by just flipping one digit then print 'YES' else print 'NO'.

Input Format:

The first line contains a number made up of 0's and 1's.

Output Format:

Print 'YES' or 'NO' accordingly without quotes.

Example:

Input:

101

Output:
YES

3. Find all occurrences of “USA” in given string ignoring the case
Expected Outcome:

input_str = "Welcome to USA. usa awesome, isn't it?"
The USA count is: 2

QUESTION SET-4

1. Write a program that computes the net amount of a bank account based a transaction log from console input. The transaction log format is shown as following:
D 100
W 200

D means deposit while W means withdrawal.
Suppose the following input is supplied to the program:
D 300
D 300
W 200
D 100
Then, the output should be:
500

2. Write a program which accepts a sequence of words separated by whitespace as input to print the words composed of digits only.

Example:
If the following words is given as input to the program:

2 cats and 3 dogs.

Then, the output of the program should be:

23

3. Count the frequency of alphabets in a given string. INPUT FORMAT: Input consists of 1 string.

SAMPLE INPUT & OUTPUT:

Enter the string

google

e 1

g 2

l 1

o 2

QUESTION SET-5

1. Write a program that accepts a sentence and calculate the number of letters and digits. Suppose the following input is supplied to the program:

Hello world! 123

Then, the output should be:

LETTERS 10

DIGITS 3

2. Arrange String characters such that lowercase letters should come first. Given input String of combination of the lower and upper case arrange characters in such a way that all lowercase letters should come first.

Expected Output:

Input_String: PyNaTive
Output_String:aeiNPTvy

3. Cryptography, a Caesar cipher, also known as Caesar's cipher, the shift cipher, Caesar's code or Caesar shift, is one of the simplest and most widely known encryption techniques. It is a type of substitution cipher in which each letter in the plaintext is replaced by a letter some fixed number of positions down the alphabet. For example, with a right shift of 2, D would be replaced by F, E would become H, and so on. The method is named after Julius Caesar, who used it in his private correspondence. Write a Python program to create a Caesar encryption

QUESTION SET-6

1. Write a program that accepts a sentence and calculate the number of upper case letters and lower case letters. Suppose the following input is supplied to the program:

Hello world!
Then, the output should be:
UPPER CASE 1
LOWER CASE 9

2. Write a Python program to count repeated characters in a string. Go to the editor
Sample string: 'thequickbrownfoxjumpsoverthelazydog'
Expected output:
o 4
e 3
u 2
h 2
r 2
t 2

3. Antakshari is a popular parlor game played in India. Many word games are similar to antakshari. One such game is wordakshari. The game can be played by two or more people. The first player has to recite a word. The last letter of the word is then used by the next player to recite another word starting with that letter. The winner or winning team is decided by a process of elimination. The person or the team that cannot come up with a word with the right consonant is eliminated. The following rules need to be followed while playing this game. (ii) All other words have to begin with the last letter of the previous word (iii) No words can be repeated. Write a program to print the wordakshari chain.
Input Format:

Input consists of n+1 lines.

The first n lines contain strings corresponding to the words in the chain and the last line of input contains the string #### to mark the end of input.

Output Format:

The output consists of the valid wordakshari chain and the first word can begin with any letter.

Sample Input:

architect
tailor
referee
electrician
nurse
blacksmith
####

Sample Output:

architect
tailor
referee
electrician
nurse

QUESTION SET-7

1. A website requires the users to input username and password to register. Write a program to check the validity of password input by users.
Following are the criteria for checking the password:

I. At least 1 letter between [a-z]

II. At least 1 number between [0-9]

III. At least 1 letter between [A-Z]

IV. At least 1 character from [$#@]

V. Minimum length of transaction password: 6

VI. Maximum length of transaction password: 12

2. Write a program which accepts a string from console and print the characters that have even indexes.

Example:
If the following string is given as input to the program:

H1e2l3l4o5w6o7r8l9d

Then, the output of the program should be:

Hello world

3. Given a string, write a program to find the first element which is non -repetitive i.e that element must not be present anywhere else in the string. INPUT & OUTPUT FORMAT: The first line of the input consists of a string. Assume the maximum size of the string as 50. The output displays a character which is non-repetitive. If all the characters in an input string are repetitive, then display "All characters are repetitive"(without quotes)

SAMPLE INPUT:

teeterson

SAMPLE OUTPUT:

r

QUESTION SET-8

1. Write a program in python to read a sentence and replace lowercase characters by uppercase and vice-versa.

Test Data:
Input the string: This Is A Test String.

Expected Output:

The given sentence is : This Is A Test String.
After Case changed the string is: tHIS iS a tEST sTRING

2. Write a program that accepts sequence of lines as input and prints the lines after making all characters in the sentence capitalized.
Suppose the following input is supplied to the program:
Hello world
Practice makes perfect
Then, the output should be:
HELLO WORLD
PRACTICE MAKES PERFECT

3. These days' kids are introduced to computers at a very early age. The kids are taught about alphabets, digits and blank spaces. The teacher asked the students to count the vowels, consonants, digits and white spaces in a string. The teacher found it a bit difficult to evaluate these tests and she knew that the 12th class students are learning C programming. So she assigned this task to them to count the vowels, consonants, digits and white spaces in a string. Can you please help them out? Write a program to count the vowels, consonants, digits, white spaces, and symbols in a string. INPUT & OUTPUT FORMAT: Input consists of a string. Assume the maximum length of the string is 200. The characters in the string can contain both uppercase and lowercase. Refer sample input and output for formatting specifications.

SAMPLE INPUT:
This program is very easy 2 complete

SAMPLE OUTPUT:
Vowels: 10
Consonants: 19
White spaces: 6
Digits: 1
Symbols: 0

QUESTION SET-9

1. Write a program in C to check whether two given strings are an anagram. Go to the editor
Test Data:
Input the first String: spare
Input the second String: pears

Expected Output:
spare and pears are Anagram

Note: An anagram is a word or phrase formed by rearranging the letters of a different word or phrase, typically using all the original letters exactly once. For example, the word anagram can be rearranged into nag a ram, or the word binary into brainy or the word adobe into abode.

2. Given a string of size n, write functions to perform following operations on string.

Left (Or anticlockwise) rotate the given string by d elements (where d <= n).
Right (Or clockwise) rotate the given string by d elements (where d <= n).

Input: s = "qwertyu"
d = 2
Output: Left rotation : "ertyuqw"
Right rotation : "yuqwert"

3. In a blind organization, they were playing the typing a keyword game and they want to correct the form of the word. So help them to by writing a program to remove all special symbols and print the characters of a string. INPUT & OUTPUT FORMAT: Input consists of a string. Assume the maximum length of the string is 200. The characters in the string can contain both uppercase, lowercase, and symbols.

SAMPLE INPUT:

pro$#&gra7m

SAMPLE OUTPUT:

Program

QUESTION SET-10

1. Define a function that can accept two strings as input and print the string with maximum length in console. If two strings have the same length, then the function should print al l strings line by line.

2. You are asked to ensure that the first and last names of people begin with a capital letter in their passports. For example, alison heck should be capitalised correctly as Alison Heck.

3. These days' kids are introduced to computers at a very early age. The kids are taught about alphabets, digits and blank spaces. The teacher asked the students to count the vowels, consonants, digits and white spaces in a string. The teacher found it a bit difficult to evaluate these tests and she knew that the 12th class students are learning C programming. So she assigned this task to them to count the vowels, consonants, digits and white spaces in a string. Can you please help them out? Write a program to count the vowels, consonants, digits, white spaces, and symbols in a string. INPUT & OUTPUT FORMAT: Input consists of a string. Assume the maximum length of the string is 200. The characters in the string can contain both uppercase and lowercase. Refer sample input and output for formatting specifications.

SAMPLE INPUT:

This program is very easy 2 complete

SAMPLE OUTPUT:

Vowels: 10

Consonants: 19

White spaces: 6

Digits: 1

Symbols: 0

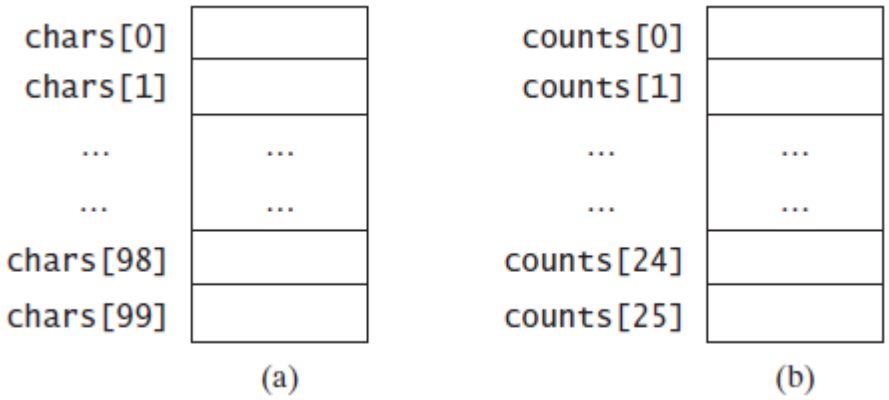
Ex: No. 7 **LIST**

Objective

To create python application which solve the real time problem using list.

QUESTION SET-1

1. Generates 100 lowercase letters randomly and assigns them to a list of characters, Named chars, as shown figure (a).



(a) (b)

The chars list stores 100 characters, and the counts list stores 26 counts shown in the figure (b), each of which counts the occurrences of a letter. Write a python program to achieve the above operation.

Sample Input and Output:

The lowercase letters are:
e y l s r i b k j v j h a b z n w b t v
s c c k r d w a m p w v u n q a m p l o
a z g d e g f i n d x m z o u l o z j v
h w i w n t g x w c d o t x h y v z y z
q e a m f w p g u q t r e n n w f c r f

The occurrences of each letter are:
5 a 3 b 4 c 4 d 4 e 4 f 4 g 3 h 3 i 3 j
2 k 3 l 4 m 6 n 4 o 3 p 3 q 4 r 2 s 4 t
3 u 5 v 8 w 3 x 3 y 6 z

2. Write a Python program to create a list by concatenating a given list which range goes from 1 to n.

Sample list: ['p', 'q']
n =5
Sample Output : ['p1', 'q1', 'p2', 'q2', 'p3', 'q3', 'p4', 'q4', 'p5', 'q5']

QUESTION SET-2

1. Write a Python program to generate first 'n' Fibonacci numbers. Store the generated Fibonacci numbers in a list and display it.
Sample input: Enter n 5
Sample Output: List: [0, 1, 1, 2, 3]

2. Write a menu driven application to maintain the department details of a Presidency University using. Your application must contain the following functionalities.

I. For each department maintain the following details.
II. deptName
III. hodName
IV. noOfFaculty
V. noOfStudents
VI. noOfPrograms
VII. Get the department details from user
VIII. In the menu give the user options to add, edit, delete or display the department details

QUESTION SET-3

1. ABC Retail Store sells different varieties of Furniture to the customers. The list of furniture's available and its cost list are given below:

Furniture	Sofa set	Dining table	T.V. Stand	Cupboard
Cost in Rs.	20,000	8,500	4,599	13,920

The furniture's and its corresponding Cost should be stored as a list. If the required furniture is available in list of furniture's listed above and Quantity purchased is greater than zero, only then bill amount should be calculated. In case of invalid values for furniture required by the customer and quantity purchased, consider bill amount to be 0.Initialize required furniture and required quantity with different values and test the results. Write a Python program to calculate and display the bill amount to be paid by the customer based on the furniture bought and quantity purchased.

2. Read two lists of integers. Display whether both lists are of same length, whether the elements in each list sum up to the same value and whether there are any values that occur in both the lists.

QUESTION SET-4

1. Delhi University wants to automate the students information processing. Read number of users and perform following functionalities.
   I. Get the student details from user for each student must have the details such as name, registerNo, department, specialization, cgpa, hostelName, mentorName, noOfArrears and store it in student_info list.
   II. Display the student list with all details in a proper and neat format.
   III. Display the list of students with cgpa> 8.0
   IV. Display the list of students with arrears

2. Given the list L = [“walnut”, “eggplant”, “lemon”, “lime”, “date”, “onion”, “nectarine”, “endive”]:

I. Create another list (called newList) containing the first letter of each element of L (e.g newList =["w", "e", ...]).
II. Add a space to newList at position 4 and append an exclamation mark (!) at the end.
III. Print the list.
IV. Print the content of the list joining all the elements with an empty space

QUESTION SET-5

1. CIT College need the library automation application which should perform the following functionalities.

    I. The following details must be there for each Book
        i. bookTitle
        ii. bookAuthor
        iii. bookNoOfCopies
        iv. bookAvailability
        v. bookEdition
        vi. bookPublisher
    II. Add the Book details into library automation application
    III. Update the Book details in library automation application
    IV. Display the Book list with all details in a proper and neat format.
    V. Display the list of books of Ashok Nandev author

2. Given the list L = [10, 60, 72, 118, 11, 71, 56, 89, 120, 175] write a python program to find the min, max and median value. Write a python program to create a list with only the elements at even indexes (i.e. [10, 72, 11,], note that the”..” means that the list is not complete) and re-compute min, max and median values. Finally, re-do the same for the elements located at odd indexes (i.e. [60, 118,]).

QUESTION SET-6

1. Write python program to implement Employee Payroll structure

SAMPLE INPUT & OUTPUT:

Enter the number of employees: 2

Enter your input for every employee:

Employee ID: 101

Employee Name: Rajkumar
Basic Salary: 5000
HRA: 500
DA: 300
Medical Allowance: 500
PF: 1000
Insurance: 400

Employee ID: 102
Employee Name: Ramkumar
Basic Salary: 3000
HRA: 200
DA: 300
Medical Allowance: 500
PF: 800
Insurance: 200

Enter employee ID to get payslip: 101

Salary Slip of Rajkumar:
Employee ID: 101
Basic Salary: 5000
House Rent Allowance: 500
Dearness Allowance: 300
Medical Allowance: 500
Gross Salary: 75600.00 Rupees

Deductions:
Provident fund: 1000
Insurance: 400
Net Salary: 58800.00 Rupees

2. Given the string S="apple|pear|apple|cherry|pear|apple|pear|pear|cherry|pear|strawberry". Store the elements separated by the "|" in a list.
How many elements does the list have?
Knowing that the list created at the previous point has only four distinct elements (i.e. "apple","pear","cherry" and "strawberry"), create another list where each element is a tuple containing the name of the fruit and its multiplicity (that is how many times it appears in the original list). Ex. list_of_tuples = [("apple", 3), ("pear", "5"),…]
Print the content of each tuple in a separate line

QUESTION SET-7

1. Write a python program to find the mean, median, mode, and range for the following list of values:
13, 18, 13, 14, 13, 16, 14, 21, 13

The mean is the usual average:
(13 + 18 + 13 + 14 + 13 + 16 + 14 + 21 + 13) ÷ 9 = 15

The median is the middle value, so first you have to rewrite the list in numerical order:
13, 13, 13, 13, 14, 14, 16, 18, 21
There are nine numbers in the list, so the middle one will be the (9 + 1) ÷ 2 = 10 ÷ 2 = 5th number:
13, 13, 13, 13, 14, 14, 16, 18, 21
So the median is 14.
The mode is the number that is repeated more often than any other, so 13 is the mode.
The largest value in the list is 21, and the smallest is 13, so the range is 21 – 13 = 8.

Mean: 15
Median: 14
Mode: 13
Range: 8

2. Read a list of integers from the keyboard assign it to input list, and crate new list that should store only integers between 1 and 100.

QUESTION SET-8

1. Create a list which contains the first three odd positive integers and a list b which contains the first three even positive integers. Create a new list c which combines the numbers from both lists (order is unimportant). Create a new list d which is a sorted copy of c, leaving c unchanged and perform the following operation.

I. Reverse d in-place.
II. Set the fourth element of c to 42.
III. Append 10 to the end of d.
IV. Append 7, 8 and 9 to the end of c.
V. Print the first three elements of c.
VI. Print the last element of d without using its length.
VII. Print the length of d.
VIII. Print the element of c and d.

2. Write a function which implements linear search. It should take a list and an element as a parameter, and return the position of the element in the list. If the element is not in the list, the function should print element is not found.

QUESTION SET-9

1. Write a menu driven application to maintain the smart phone technical specifications for Samsung using List Your application must contain the following functionalities.

I. For each mobile your application must maintain the details such as productName, operatingSystem, display Size, memory, etc.

II. Get the product details from admin

III. Display the Smart Phone list with all details in a proper and neat format.

IV. Display the list of mobiles with display size > 10cms

2. Write a function called has_duplicates that takes a list and returns True if there is any Element that appears more than once. It should not modify the original list.

QUESTION SET-10

1. Given the following two lists of integers: [1, 13, 22, 7, 43, 81, 77, 12, 15, 21, and 84,100] and [44, 32, 7, 100, 81, 13, 1, 21, 71] Write a python program to perform the following task.

I. Sort the two lists

II. Create a third list as intersection of the two lists (i.e. an element is in the intersection if it is present in both lists).

III. Create a fourth list which contain minimum of list1 and list2.

IV. Print the four lists

2. Write a function which implements binary search. You may assume that the input list will be sorted.

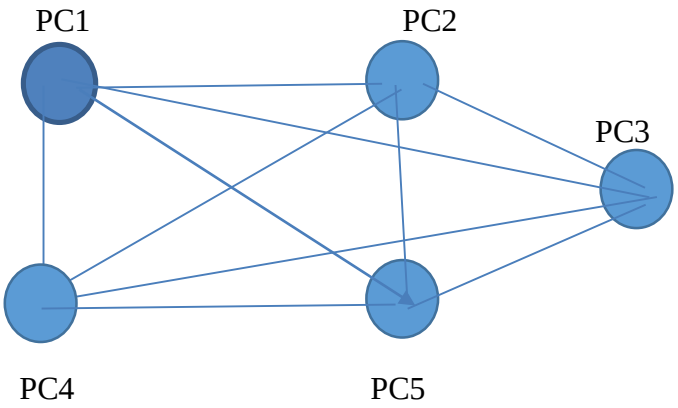
Ex: No. 7 **DICTIONARIES**

Objective

To create python application which solve the computer science problem using dictionaries.

QUESTION SET-1

1. The following graph represents the local area network. Write a python program to store the graph in the Dictionary and perform the following function.



Note: we can assume that relations between nodes are transitive. node1 --> node2 implies node2 --> node1.
Write a python script to answer the following question.

I. Store the network information in a dictionary having node1 as key and the list of all nodes2 associated to it as value.

II. Find all first neighbors of "PC1" (i.e. the nodes that are directly connected to "PC1") and print them

III. Find all the second neighbors of "PC2" (i.e. the nodes that are connected to nodes directly connected to "PC2").

2. Given an integer array, print all distinct elements in array. The given array may contain duplicates and the output should print every element only once. The given array is not sorted.

Examples:

Input: arr[] = {12, 10, 9, 45, 2, 10, 10, 45}
Output: 12, 10, 9, 45, 2

Input: arr[] = {1, 2, 3, 4, 5}
Output: 1, 2, 3, 4, 5

Input: arr[] = {1, 1, 1, 1, 1}
Output: 1

3. Given an array of names of candidates in an election. A candidate name in array represents a vote casted to the candidate. Print the name of candidates received Max vote. If there is tie, print lexicographically smaller name.

Examples:

Input: votes = ["Raja", "Raja", "Elango",
"Elango", "Elango", "Elango",
"Elango", "john", "john",
"Alfred", "Raja", "Raja",
"Raja"];
Output: Elango
We have four Candidates with name as 'Raja',
'Elango', 'john', 'Alfred'. The candidates
Raja and Elango get maximum votes. Since Elango is alphabetically smaller, we print it.

QUESTION SET-2

1. Write a program performing the following tasks over the dictionary: phonebook= {'John': "00903234561",'Mary': "02359332865",'Bill': "004934784530"}

I. return all names of the phonebook (use function keys(), i.e. tel.keys())
II. return all phone numbers of the phonebook (use function values())
III. return all names and phone numbers in tuples of type (name,tel) (use function items())
IV. ask for an alphabetically sorted telephone book
V. ask for the phone number for Mary (you can access values by using dict[key])
VI. add new entries in the phonebook (use the function update(key=value) and tel[key] = value)
VII. delete an entry (you can use: del dict[key]))
VIII. check whether there is "John" on the phonebook (use: key in dict)

2. Write python program to convert octal number to binary number using following OctToBinarytable dictionaries.
OctToBinarytable={'0':'000','1':'001','2':'010','3':'011','4':'100','5':'101','6':'110','7':'111'}

Example
Input: 543
Output: 101100011

3.Consider the scenario of processing marks of students for a course in student management system. Given below is the list of marks scored by students. Find top three scorers for the course and also display average marks using dictionaries.

Student Name	Marks Scored
John	86.5
Jack	91.2
Jill	84.5
Harry	72.1
Joe	80.5

Raja	10.3
Elango	20.1
Selvam	30.3
Babu	40.4

QUESTION SET-3

1. Given below is a Dictionary customer_details representing customer Details from retail application - Customer Id is key and Customer Name is value. customer_details = {1001: "John", 1004: "Jill", 1005: "Joe", 1003: "Jack"} Write Python code to perform below mentioned operations:

I. Print details of Customers
II. Print number of Customers
III. Print Customer names in ascending order
IV. Delete the details of customer with customer id = 1005 and print updated dictionary
V. Update the name of customer with customer id = 1003 to "Mary" and print updated dictionary
VI. Check whether details of customer with customer id 1002 exists in the dictionary.

2. Write a python program to read multiple word from the keyword and print the all unique word on the screen.

Example:
Input: Python is an interpreted language and Python is high level language
Output: Python is an is interpreted language and high level

3. Write a function histogram that string as parameters and generate a frequency of character contained in it.

Example:
Input: S="AAPPLE"
Output= {'A':2,'E':1,'P':2,'L':1}

QUESTION SET-4

1. Write a python program to pass list to a function. Calculate total number of Positive and negative numbers from the list. Finally display the count in terms of the dictionary.

Example:
Input: L [1, 2,-33,-44, 66, 55]
Output: {'Neg':2,'Pos':4}

2. Create a new dictionary called prices using {} format Put the following values in your prices dictionary:

"banana": 4,
"apple": 2,
"orange": 1.5,
"pear": 3
Loop through each key in prices. For each key, print out the key along with its price and stock information. Print the answer in the following format:
apple
price: 2

stock: 0

Let's determine how much money you would make if you sold all of your food. Create a variable called total and set it to zero. Loop through the prices dictionaries. For each key in prices, multiply the number in prices by the number in stock. Print that value into the console and then add it to total. Finally, outside your loop, print total.

3. Create a list called groceries with the values "banana", "orange", and "apple". Define this two dictionaries:

```
stock = {
    "banana": 6,
   "apple": 0,
    "orange": 32,
    "pear": 15
}

prices = {
   "banana": 4,
    "apple": 2,
    "orange": 1.5,
    "pear": 3
}
```

Define a function compute bill that takes one argument food as input. In the function, create a variable total with an initial value of zero. For each item in the food list, add the price of that item to total. Finally, return the total. Ignore whether or not the item you're billing for is in stock. Note that your function should work for any food list.Make the following changes to your compute_bill function: While you loop through each item of food, only add the price of the item to total if the item's stock count is greater than zero.If the item is in stock and after you add the price to the total, subtract one from the item's stock count.

QUESTION SET-5

1. Given two dictionary, the task is to combine the dictionaries such that we get the added values for common keys in resultant dictionary.

Example:

Input: dict1 = {'a': 12, 'b': 25, 'for': 9}
dict2 = {'Raja': 100, 'raja': 200, 'for': 300}

Output: {'a': 12, 'b': 25, 'for': 309, 'Raja': 100, 'raja': 200}

2. Given a dictionary and a character array, print all valid words that are possible using characters from the array.

Note: Repetitions of characters is not allowed.

Examples:

Input : Dict = ["go","bat","me","eat","goal","boy", "run"]
arr = ['e','o','b', 'a','m','g', 'l']
Output: go, me, goal.

3. Write a program which count and print the numbers of each character in a string input by console.

Example:
If the following string is given as input to the program:

abcdefgabc

Then, the output of the program should be:

a,2
c,2
b,2
e,1
d,1
g,1
f,1

QUESTION SET-6

1. Write a program that reads in a string on the command line and returns a table of the letters of the alphabet in alphabetical order which occur in the string together with the number of times each letter occurs. Case should be considered. A sample run of the program would look this this:

Example:
Input: S="Test Letters"
Output:
e 3
L 1
r 1
s 2
T 1
t 3

2. Consider the following price details of the S.R departmental store,

Item name	**Price**
Biscuit	10
BREAD	20
SUGAR	84
JAM	40
CHEESE	130
BOURNVITA	240
TEA Powder	200
MILK	30
COFFEE Powder	40
CORNFLAKES	56
RICE	78

DAL	100

The customers Elango bought the following items

SUGAR
JAM
CHEESE
BOURNVITA
TEA Powder
CORNFLAKES
CHEESE
BOURNVITA
TEA Powder
CORNFLAKES
Biscuit
BREAD
SUGAR
JAM
CHEESE
BOURNVITA
TEA Powder
MILK
COFFEE Powder
CORNFLAKES
RICE
DAL

The customers Raja bought the following items

SUGAR
JAM
CHEESE
BOURNVITA
TEA Powder
CORNFLAKES
CHEESE
BOURNVITA
CHEESE
BOURNVITA
TEA Powder
MILK

I. Write a python program to compute a Total amount paid by the elango.
II. Write a python program to compute a Total amount paid by the Raja.

3. Define a function which can generate a dictionary where the keys are numbers between 1 and 20 (both included) and the values are square of keys. The function should just print the values only.

QUESTION SET-7

1. Given three arrays sorted in non-decreasing order, print all common elements in these arrays.

Examples:
Input: ar1 = [1, 5, 10, 20, 40, 80]
ar2 = [6, 7, 20, 80, 100]
ar3 = [3, 4, 15, 20, 30, 70, 80, 120]
Output: [80, 20]

Input: ar1 = [1, 5, 5]
ar2 = [3, 4, 5, 5, 10]
ar3 = [5, 5, 10, 20]
Output: [5, 5]

2. Given below is a Dictionary customer_details representing customer Details from Retail Application - Customer Id is key and Customer Name is value. Customer_details = {1001: "John", 1004: "Jill", 1005: "Joe", 1003: "Jack"} Write Python code to perform below mentioned operations:

I. Print details of Customers
II. Print number of Customers
III. Print Customer names in ascending order
IV. Delete the details of customer with customer id = 1005 and print updated dictionary
V. Update the name of customer with customer id = 1003 to "Mary" and print updated dictionary
VI. Check whether details of customer with customer id 1002 exists in the dictionary.

3. Write a program that reads an N number of integers and finds the ones that have the most occurrences You have entered.
Sample Input and Output:
N=5
2
3
40
3
3
The number 3 occurs most often

QUESTION SET-8

1. Given a string, find all the duplicate characters which are similar to each other's.

Input: hello
Output: l

Input: Raja
Output: a

2. Given a sentence containing n words/strings. Remove all duplicates words/strings which are similar to each other's.

Input: Python is great and Java is also great
Output: Python is great and Java also

3. Given an array of names of candidates in an election. A candidate name in array represents a vote casted to the candidate. Print the name of candidates received Max vote. If there is tie, print lexicographically smaller name.

Examples:

Input: votes = ["Raja", "Raja", "Elango",
"Elango", "Elango", "Elango",
"Elango", "john", "john",
"Alfred", "Raja", "Raja",
"Raja"];
Output: Elango
We have four Candidates with name as 'Raja',
'Elango', 'john', 'Alfred'. The candidates
Raja and Elango get maximum votes. Since Elango is alphabetically smaller, we print it.

QUESTION SET-9

1. Given two strings, find if we can make first string from second by deleting some characters from second and rearranging remaining characters.

Input : s1 = ABHISHEKsinGH
: s2 = gfhfBHkooIHnfndSHEKsiAnG
Output : Possible

Input : s1 = Hello
: s2 = dnaKfhelddf
Output : Not Possible

2. Create a dict directory which stores telephone numbers (as string values), and populate it with these key-value pairs:

Name	Telephone number
Jane Doe	+27 555 5367
John Smith	+27 555 6254
Bob Stone	+27 555 5689

Change Jane's number to +27 555 1024
Add a new entry for a person called Anna Cooper with the phone number +27 555 3237

Print Bob's number.
Print Bob's number in such a way that None would be printed if Bob's name were not in the dictionary.
Print all the keys. The format is unimportant, as long as they're all visible.
Print all the values.

3. Write a function called word frequencies(mylist) that accepts a list of strings called mylist and returns a dictionary where the keys are the words from mylist and the values are the number of times that word appears in mylist

QUESTION SET-10

1. Given the following table, reporting molecular weights for each amino acid, store them in a dictionary where the key is the one letter code and the value is the molecular weight (e.g. {"A" : 89, "R":174"}).

Amino Acid	Three-Letter Abbreviation	One-Letter Symbol	Molecular Weight
Alanine	Ala	A	89Da
Arginine	Arg	R	174Da
Asparagine	Asn	N	132Da
Aspartic acid	Asp	D	133Da
Asparagine or aspartic acid	Asx	B	133Da
Cysteine	Cys	C	121Da
Glutamine	Gln	Q	146Da
Glutamic acid	Glu	E	147Da
Glutamine or glutamic acid	Glx	Z	147Da
Glycine	Gly	G	75Da
Histidine	His	H	155Da
Isoleucine	Ile	I	131Da
Leucine	Leu	L	131Da
Lysine	Lys	K	146Da
Methionine	Met	M	149Da
Phenylalanine	Phe	F	165Da
Proline	Pro	P	115Da
Serine	Ser	S	105Da
Threonine	Thr	T	119Da
Tryptophan	Trp	W	204Da
Tyrosine	Tyr	Y	181Da
Valine	Val	V	117Da

Write a python script to answer the following questions:

I. What is the average molecular weight of an aminoacids?

II. What is the total molecular weight and number of aminoacids of the P53 peptide GSRAHSSHLKSKKGQSTSRHK?

III. What is the total molecular weight and number of aminoacids of the peptide YTSLIHSLIEESQNQQEKNEQELLELDKWASLWNWF?

2. Write a function called accept login (users, username, password) with three parameters: users a dictionary of username keys and password values, username a string for a login name and password a string for a password. The function should return True if the user exists and the password is correct and False otherwise.
3. Write a program that reads in a string on the command line and returns a table of the letters of the alphabet in alphabetical order which occur in the string together with the number of times each letter occurs. Case should be considered. A sample run of the program would look this this:

Example:
Input: S="Test Letters"
Output:
e 3
L 1
r 1
s 2
T 1
t 3

Ex: No. 8 **FILE HANDLING AND EXCEPTION HANDLING**

Objective

To create python application which solve the following problem using file and exception handling concepts.

QUESTION SET-1

1. Write a python program that: reads the text file sample_text.txt and stores in a dictionary how many times each word appears (hint: the key is the word and the count is the value); Prints to screen how many lines the file has and how many distinct words are in the file; Writes to a text file (scientist_histo.csv) the histogram of the words in comma separated value format (i.e. word, count). Words must be sorted alphabetically; finally, write a function that prints to screen (alphabetically) all the words that have a count higher than a threshold N and apply it with N = 15.

2. Consider the customer ids of a customer in the Retail Store. Customer id can be vary between 1001 to 1100. Store the customer id in a list and handle appropriate exceptions for the following:

i. Generate exception when customer id is not between 1001 to 1100
ii. Generate the exception when customer id is string.

QUESTION SET-2

1. Write a program to read a file of numbers, one in each line (you can use as a Sample file numbers.txt from the LMS-site) and perform the following task.

i. The count of numbers in the file.
ii. The sum of the number in the file.
iii. The smallest number in the file (the minimum).
iv. Write all this details into excel file in the following format.

Count of numbers	Sum of numbers	smallest number
10	2000	2

2. Consider the employee management system has the following information 1.employee id, 2.employee name, 3.salary and 4. Type of employee. Store the employee details in a list and handle appropriate exceptions for the following:

i. Generate exception when employee salary is negative.
ii. Generate the exception when employee type is other than full time or part time

QUESTION SET-3

1. The Fisher's dataset regarding Petal and Sepal length and width in csv format can be taken from learning management system. These are the measurements of the flowers of fifty plants each of the two species Iris setosa and Iris versicolor.

The header of the file is:

```
Species Number,Species Name,Petal width,Petal length,Sepal length,Sepal width
```

Species Number,Species Name,Petal width,Petal length,Sepal length, Sepal width

Write a python script that reads this file in input (feel free to hard-code the filename in the code) and computes the average petal length and width and sepal length and width for each of the three different Iris species. Print them to the screen alongside the number of elements.

2. Add a try-except statement to the body of this function which handles a possible IndexError, which could occur if the index provided exceeds the length of the list. Print an error message if this happens:

```
def print_list_element(thelist, index):
    print(thelist[index])
```

QUESTION SET-4

1. Write program to read the contents of a file Grades.Txt (you can use as a sample file Grade.txt from the LMS-site) calculate the total marks and percentage obtained by a students. Write the student's student name, total marks and percentage details into summary.csv file.
2. Function adds an element to a list inside a dict of lists. Rewrite it to use a try-except statement which handles a possible KeyError if the list with the name provided doesn't exist in the dictionary yet, instead of checking beforehand whether it does. Include else and finally clauses in your try-except block:

```
def add_to_list_in_dict(thedict, listname, element):
    if listname in thedict:
        l = thedict[listname]
        print("%s already has %d elements." % (listname, len(l)))
    else:
        thedict[listname] = []
        print("Created %s." % listname)

    thedict[listname].append(element)

    print("Added %s to %s." % (element, listname))
```

QUESTION SET-5

1. Write a Python program to copy the contents of a file to another file
2. Consider the inventory management system includes following details stock number, quantity, and price. Store the inventory details into list and handle appropriate exceptions for the following:
    I. An error message, if the stock number is negative or higher than 999
    II. The quantity, if it is less than 0
    III. The price, if it is over $100.00

QUESTION SET-6

1. Write a function which take three parameters. First parameters to the function is the list, second parameters is the index positions and third one is the string. The function will insert the string at the given index positions within the list. In case of failure, the function needs to return in the original list. Write a function that will ensure this task using the try and except block.
2. Write a python program to find most frequent word in sample.txt file and write the most frequent word into out.csv file.

QUESTION SET-7

1. Write a python program to print unique word in sample.txt file.
2. Consider the mark details of a student in the university. Mark can be vary between 1 to 100. Store the marks in a list and handle appropriate exceptions for the following:
i. Generate exception when customer marks is not between 1 to 100
ii. Generate the exception when marks is string.

QUESTION SET-8

1. You've been hired by a law firm that is working on a sex discrimination case. Your firm has obtained a file of incomes, income.txt, which contains the salaries for every employee in the company being sued. Each salary amount is preceded by "F" for female or "M" for male. As a first pass in the analysis of these data, you've been asked to compute the average income for females and the average income for males. The number of males and the number of females should be output as well. The output should be saved on a file for later review.

2. Write a recursive function which calculates the factorial of a given number. Use exception handling to raise an appropriate exception if the input parameter is not a positive integer, but allow the user to enter floats as long as they are whole numbers

QUESTION SET-9

1. Write a program that reads in a Python source code file and counts the occurrence of each keyword in the file. Your program should prompt the user to enter the Python source code filename.

2. Write a function called calculator. It should take the following parameters: two numbers, an arithmetic operation (which can be addition, subtraction, multiplication or division and is addition by default), and an output format (which can be integer or floating point, and is floating point by default). Division should be floating-point division.

The function should perform the requested operation on the two input numbers, and return a result in the requested format (if the format is integer, the result should be rounded and not just truncated). Raise exceptions as appropriate if any of the parameters passed to the function are invalid.

Call the function with the following sets of parameters, and check that the answer is what you expect:

2, 3.0
2, 3.0, output format is integer
2, 3.0, operation is division
2, 3.0, operation is division, output format is integer

QUESTION SET-10

1**.** In a small firm employee numbers are given in serial numerical order that is 1, 2, 3, etc. Create a file of employee data with following information: employee number, name, sex, gross salary. If more employees join, append their data to the file. If an employee with serial number 25 (say) leaves, delete the record by making gross salary 0. If some employee's gross salary increases, retrieve the record and update the salary. Write a program to implement the above operations.

2. Consider the employee ids of an employee in the PAYROLL system. Employee id can be vary between 1001 to 1100. Store the employee id in a list and handle appropriate exceptions for the following:
i. Generate exception when employee id is not between 1001 to 1100
ii. Generate the exception when employee id is string**.**

Ex: No. 9 **OBJECT ORIENTED PROGRAMMING**

Objective

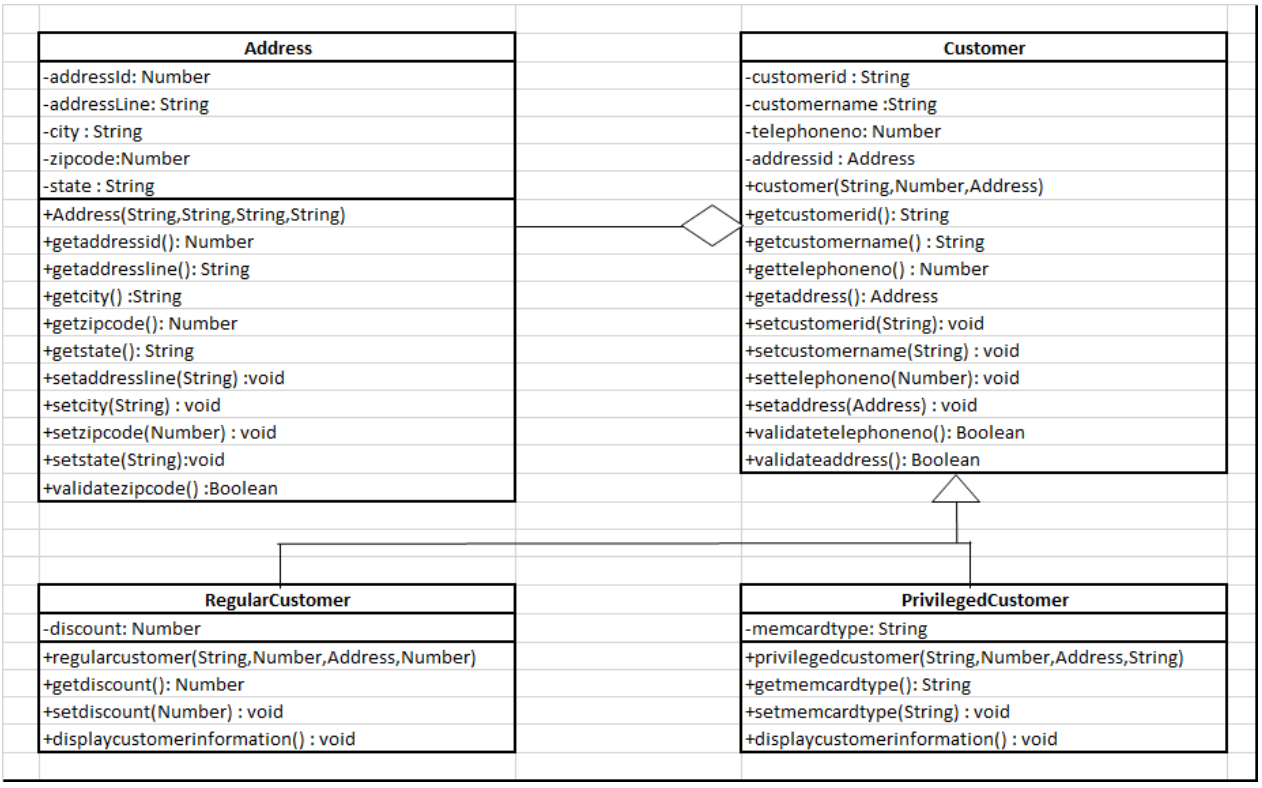
To create python application which solve the following enterprise application using object oriented programming concepts.

Problem Description:
Easy Shop Retail Application:

Easy shop wants to automate their customer details in system. The automation involves in maintenance of customers information's. Customers can be regular or privileged customers. Customers who are regular visitors to the store are eligible for discount on the bill amount. The privileged customers are given membership cards (Platinum, Gold and Silver). Such customers are eligible for gifts based on the type of membership card. Customers address are maintained for free home delivery of the products.

Write a Python program to implement the class diagrams below.

Class Diagram



Implementation Details:

Class: Address

Add code to **Address** based on the class diagram. Wherever needed, the additional implementation details are given below.

Constructor:

- Use parameterized constructor to initialize addressline, city, zipcode and state. Auto-generated number must be given for addressid.

validatezipcode ():

- This method validates the **zipcode** member variable and returns a **boolean** value
- zipcode must be validated for 6 digits
- This method returns true if the value of **zipcode** is valid, otherwise it must return false

Class: Customer

Add code to **Customer** based on the class diagram and the additional implementation details are given below.

Constructor

- It initializes **customername, telephoneno, address** and auto generates **customerid**.
- **customerid** should a string value prefix with 'C' followed by integer value starting from 001. For example first customerid would be C001; the second would be C002 etc.

validatetelephoneno()

- This method validates the **telephoneno** member variable and returns a **boolean** value
- **telephoneno** must be validated for 10 digits
- This method returns true if the value of **telephoneno** is valid, otherwise it must return false

validateaddress()

- This method validates the **address** member variable and returns a **addressid** value or 0
- **address** must be unique data
- This method returns the addressid from the database, if the value of **address (addressline, city, zip and state)** is already exist in the database, otherwise it must return 0

Demo Class:

- Demo class is the starter class
- Code for the Demo class is provided to you
- Read and understand the functionality of the code
- You can modify the code of Demo class for testing purpose but ensure that you are submitting it compilation error free
- Demo class will not be evaluated
- Demo class will have the option to insert/modify/delete/search customer details

Sample Output Expected:

```
**********************************************************************
**********************
                    Easy Shop Retail Application
**********************************************************************
**********************
```

1. Add New Customer
2. Modify
    a. Customer Name
    b. Customer Contact
    c. Customer Address
    d. Customer Type
    e. Discount %
    f. Membership Card Type
3. View all Customers
4. View all Regular Customers
5. View all Privileged Customers
6. Exit

&=&=&=&=&=&=&

Ex: No. 10 **DATA VISUALIZATION**

Objective

To create python application which solve the following problem using data visualization concepts.

QUESTION SET-1

1. Use company_sales_data.csv file for this exercise. Read this file using Pandas or numpy or using in-built matplotlib function. From given data set print first and last five rows
Expected Output:

Python Pandas printing first 5 rows

index		company	body-style	...	horsepower	average-mileage	price
0	0	alfa-romero	convertible	...	111	21	13495.0
1	1	alfa-romero	convertible	...	111	21	16500.0
2	2	alfa-romero	hatchback	...	154	19	16500.0
3	3	audi	sedan	...	102	24	13950.0
4	4	audi	sedan	...	115	18	17450.0

2. Get Total profit of all months and show line plot with the following Style properties Generated line plot must include following Style properties:
Line Style dotted and Line-color should be red
Show legend at the lower right location.
X label name = Month Number
Y label name = Sold units number
Add a circle marker.
Line marker color as read
Line width should be 3
The line plot graph should look like this.

QUESTION SET-2

1. Use company_sales_data.csv file for this exercise. Read this file using Pandas or numpy or using in-built matplotlib function .Clean data and update the CSV file

Replace all column values which contain '?' and n.a with NaN.

2. Read all product sales data and show it using a multiline plot

Display the number of units sold per month for each product using multiline plots. (i.e., separate Plotline for each product for each product).

The graph should look like this.

QUESTION SET-3

1. Use company_sales_data.csv file for this exercise. Read this file using Pandas or numpy or using in-built matplotlib function .Find the most expensive car company name

Print most expensive car's company name and price.

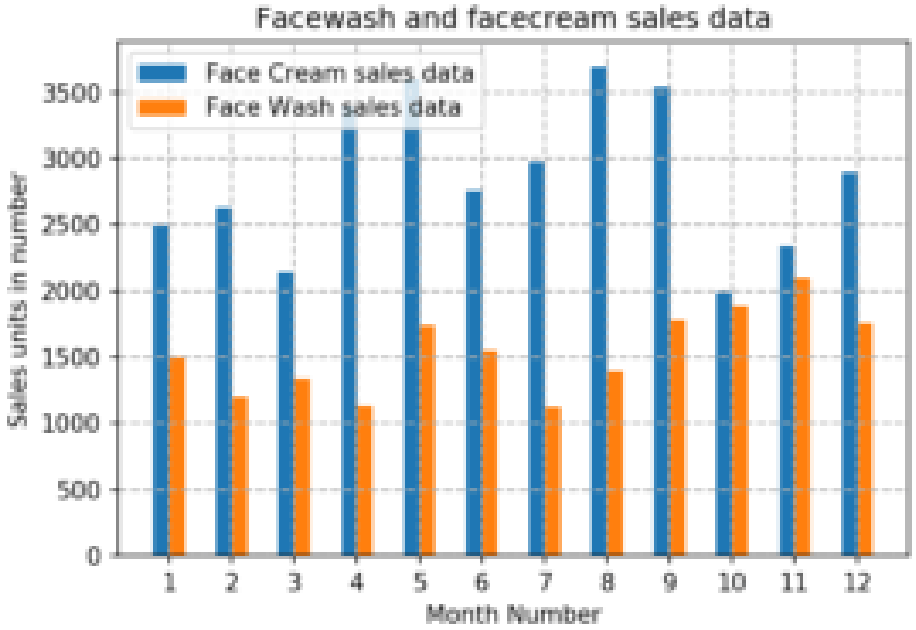
Expected Output:

	company	price
35	mercedes-benz	45400.0

2. Read face cream and face wash product sales data and show it using the bar chart Bar chart should display

the number of units sold per month for each product. Add a separate bar for each product in the same chart.

The bar chart should look like this.

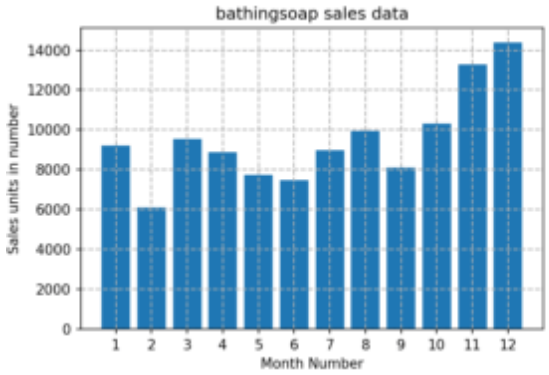


QUESTION SET-4

1. Use company_sales_data.csv file for this exercise. Read this file using Pandas or numpy or using in-built matplotlib function. Print All Toyota Cars details.

	index	company	body-style	...	horsepower	average-mileage	price
48	66	toyota	hatchback	...	62	35	5348.0
49	67	toyota	hatchback	...	62	31	6338.0
50	68	toyota	hatchback	...	62	31	6488.0
51	69	toyota	wagon	...	62	31	6918.0
52	70	toyota	wagon	...	62	27	7898.0
53	71	toyota	wagon	...	62	27	8778.0
54	79	toyota	wagon	...	156	19	15750.0

2. Read sales data of bathing soap of all months and show it using a bar chart. Save this plot to your hard disk.

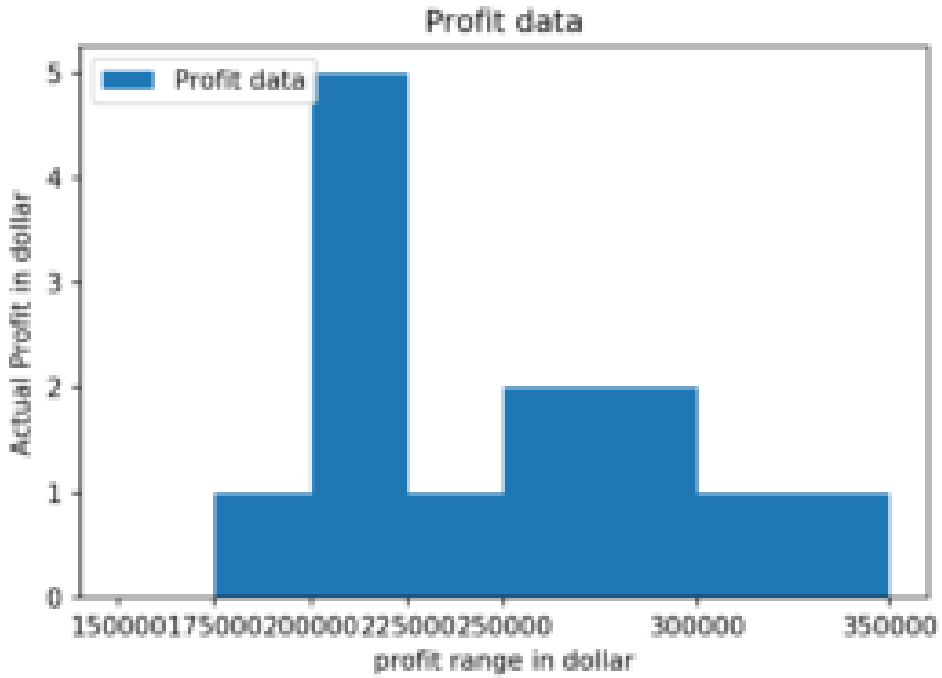


QUESTION SET-5

1. Use company_sales_data.csv file for this exercise. Read this file using Pandas or numpy or using in-built matplotlib function. Count total cars per company

```
toyota          7
bmw             6
mazda           5
nissan          5
volkswagen      4
audi            4
mitsubishi      4
mercedes-benz   4
chevrolet       3
porsche         3
jaguar          3
honda           3
alfa-romero     3
isuzu           3
dodge           2
volvo           2
Name: company, dtype: int64
```

2. Read the total profit of each month and show it using the histogram to see most common profit ranges. The histogram should look like this.



QUESTION SET-6

1. Use company_sales_data.csv file for this exercise. Read this file using Pandas or numpy or using in-built matplotlib function .Find each company's Higesht price car.

Expected Outcome:

	Company	price
Company		
alfa-romero	alfa-romero	16500.0
audi	audi	18920.0
bmw	bmw	41315.0
chevrolet	chevrolet	6575.0
dodge	dodge	6377.0
honda	honda	12945.0
isuzu	isuzu	6785.0
jaguar	jaguar	36000.0
mazda	mazda	18344.0
mercedes-benz	mercedes-benz	45400.0
mitsubishi	mitsubishi	8189.0
nissan	nissan	13499.0
porsche	porsche	37028.0
toyota	toyota	15750.0
volkswagen	volkswagen	9995.0
volvo	volvo	13415.0

2. Calculate total sale data for last year for each product and show it using a Pie chart Note: In Pie chart display Number of units sold per year for each product in percentage.
The Pie chart should look like this.

QUESTION SET-7

1. Use company_sales_data.csv file for this exercise. Read this file using Pandas or numpy or using in-built matplotlib function .Find the average mileage of each car making company

Expected Output:

company	average-mileage
alfa-romero	20.333333
audi	20.000000
bmw	19.000000
chevrolet	41.000000
dodge	31.000000
honda	26.333333
isuzu	33.333333
jaguar	14.333333
mazda	28.000000
mercedes-benz	18.000000
mitsubishi	29.500000
nissan	31.400000
porsche	17.000000
toyota	28.714286
volkswagen	31.750000
volvo	23.000000

2. Read Bathing soap face wash of all months and display it using the Subplot. The Subplot should look like this.

QUESTION SET-8

1. Use company_sales_data.csv file for this exercise. Read this file using Pandas or numpy or using in-built matplotlib function .Sort all cars by Price column

	index	company	body-style	...	horsepower	average-mileage	price
35	47	mercedes-benz	hardtop	...	184	14	45400.0
11	14	bmw	sedan	...	182	16	41315.0
34	46	mercedes-benz	sedan	...	184	14	40960.0
46	62	porsche	convertible	...	207	17	37028.0
12	15	bmw	sedan	...	182	15	36880.0

[5 rows x 10 columns]

2. Read all product sales data and show it using the stack plot

The Stack plot should look like this.

QUESTION SET-9

1. Use company_sales_data.csv file for this exercise. Read this file using Pandas or numpy or using in-built matplotlib function .Create two data frames using the following two Dicts, Concatenate those two data frames and create a key for each data frame.
GermanCars = {'Company': ['Ford', 'Mercedes', 'BMV', 'Audi'], 'Price': [23845, 171995, 135925 , 71400]}
japaneseCars = {'Company': ['Toyota', 'Honda', 'Nissan', 'Mitsubishi '], 'Price': [29995, 23600, 61500, 58900]}

Expected Output:

		Company	Price
Germany	0	Ford	23845
	1	Mercedes	171995
	2	BMV	135925
	3	Audi	71400
Japan	0	Toyota	29995
	1	Honda	23600
	2	Nissan	61500
	3	Mitsubishi	58900

2. Read Total profit of all months and show it using a line plot
Total profit data provided for each month. Generated line plot must include the following properties: –

X label name = Month Number
Y label name = Total profit
The line plot graph should look like this.

QUESTION SET-10

1. Create two data frames using the following two Dicts, Merge two data frames, and append second data frame as a new column to the first data frame.

Car_Price = {'Company': ['Toyota', 'Honda', 'BMV', 'Audi'], 'Price': [23845, 17995, 135925 , 71400]}
car_Horsepower = {'Company': ['Toyota', 'Honda', 'BMV', 'Audi'], 'horsepower': [141, 80, 182 , 160]}
Expected Output:

	Company	Price	horsepower
0	Toyota	23845	141
1	Honda	17995	80
2	BMV	135925	182
3	Audi	71400	160

2. Read toothpaste sales data of each month and show it using a scatter plot also, add a grid in the plot. Gridline style should "–".
The scatter plot should look like this.