Problem Description: Consider the list of courses opted by a Student "John" and available electives as a part of Student Management System.

courses = ("Python Programming", "RDBMS", "Web Technology", "Software Engg").
electives = ("Business Intelligence", "Big Data Analytics")

Write a Python Program to satisfy following business requirements:

a. List the number of courses opted by Student "John"
b. List all the courses opted by Student "John".
c. Student "John" is also interested in elective courses mentioned above. Print the updated tuple including electives.
d. Check whether Student "John" is allowed to change his course from "Software Engg" to "Computer Networks". If yes, print the updated course list else mention the reason for the same.

Q2

Problem Description: ABC Retail Store sells different varieties of Furniture to the customers. The list of furnitures 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.

Q3

Problem Description: Consider this scenario from student management system. Given below are 2 Sets representing the names of students enrolled for a particular course.

java_course = {“John”, “Jack”, “Jill”, “Joe”}
python_course = {“Jake”, “John”, “Eric”, “Jill”}

Write a Python program to satisfy below mentioned business requirements:

a. List the number of Students enrolled for Python course
b. List the names of Students enrolled for Java course only
c. List the names of Students enrolled for Python course only
d. List the number and names of Students enrolled for both Java and Python courses
e. List the number and names of Students enrolled for either Java or Python courses but not both
f. List names and number of Students enrolled for either Java or Python courses

Q4

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:

a. Print details of Customers

b. Print number of Customers
c. Print Customer names in ascending order
d. Delete the details of customer with customer id = 1005 and print updated dictionary
e. Update the name of customer with customer id = 1003 to “Mary” and print updated dictionary
f. Check whether details of customer with customer id 1002 exists in the dictionary.

1. **Write a python program to generate Fibonacci series up to 'n' terms store it in list and display.**
2. **Implement a stack using list**
3. **Implement a queue using list**

4. **Cate Hospital wants to know the medical specialty visited by the maximum number of patients. Assume that the Patient id of the patient along with the medical specialty visited by the patient is stored in a list. The details of the medical specialties are stored in a dictionary as follows:**

   {

   "P":"Pediatrics",

   "O":"Orthopedics",

   "E":"ENT"

   }

   Write a function to find the medical specialty visited by the maximum number of patients and return the name of the specialty.

   Note: Assume that there is always only one medical specialty which is visited by maximum number of patients.

Sample Input	Expected Output
[101, P, 102, O, 302, P, 305, P]	Pediatrics
[101, O, 102, O, 302, P, 305, E, 401, O,656, O]	Orthopedics
[101, P, 102, E, 302, P, 305, P, 401, E, 656, O, 987, E]	ENT

   Estimated Time: 40 Minutes

5. **The Road Transport Corporation(RTC) of a city wants to know whether a particular bus- route is running on profit or loss. Assume that the following information is given:**
   - **Price per Litre of fuel = 70**
   - **Mileage of the bus in km/litre of fuel = 10**
   - **Price (Rs) per Ticket = 80**

   The bus runs on multiple routes having different distance in kms and number of passengers.

   Write a Python program to calculate and return the profit earned(Rs) in each route. Return -1 in case of loss.

6. **Write a python program to find all the Strong numbers among the given list of numbers. Write a function to find and return the factorial of a number. Use it to solve the problem.**

Example of Strong number:

N=145=1!+4!+5!=1+24+120=145

Hint: Sample list can be[145, 375, 100, 2, 10]

7. **Write a python program to display all the duplicate values in a list.**

   Example :

   Sample Input: [12, 54, 68, 759, 24, 15, 12, 68, 987, 758, 25, 69]

   Expected Output: [12, 68]

   Estimated Time: 40 Minutes

8. **Given a list Integer vale, write a python program to check whether it contains same number in subsequent position. Display the count of such occurrences.**

   Estimated Time: 30 Minutes

Sample Input	Sample Output
[1, 1, 5, 100, 20, 20, 6, 0, 0]	3
[10, 20, 30, 40, 30, 20]	0
[1, 2, 2, 3, 4, 4,10]	2

9. **The Metro Bank provides various types of loan such as car loans, Business loans and house loans to its account holders. Write a python program to implement the following requirements:**

- **Initialize the following variables with appropriate input values: Account_Number, Account_balance, salary, loan_type, Loan_amount_expected and Customer_emi_Expected.**
- **The Account number should be of 4 digits and its first digit should be 1.**
- **The customer should have a minimum balance of Rupees 1 lakh in the account.**
- **If the above rules are valid, determine the eligible loan amount and the EMI that the bank can provide to its customer based on their salary and the loan type they expect to avail.**
- **The bank would provide the loan, only if the loan amount and the number of EMI's requested by the customer is less than or equal to the loan amount and the number of EMI's decided by the bank respectively.**

Display appropriate error message for the invalid data. If all the business rules are satisfied, the display account number, eligble and requested loan amount and EMI's.

Test your code by providing different values for input variables.

Salary	Loan Type	Eligible loan amount	No. of EMI's Required to Repay
>25000	Car	500000	36
> 50000	House	6000000	60
> 75000	Business	7500000	84

10. **Write a python program to find the bill amount to be paid by the customer while ordering food online from a restaurant. The bill amount includes the amount for the food ordered based on the quantity and delivery charge based on distance of delivery as mentioned below:**

    The Restaurant , home delivers the vegetarian combo costing Rs. 120 per plate and the non-vegetarian Rs. 150 per plate. Infact the restaurant gets more order for non-vegetarian combo than the vegetarian combo.

    The Customer must specify the type of food, quantity (no. of paltes) required and the approximate distance in kms from the restaurant to the delivery point.

    The below information must be use to check the validity of data provided by the customer:

    - **Type of food must be 'V' for vegetarian and 'N' for non-Vegetarian.**
    - **Distance in kms must be greater than 0.**
    - **Quantity ordered should be minimum 1**

    Identify the cost of food and delivery charge based on the type of food and distance provided. Then the bill amount must be calculated as give below:

    Bill amount = cost per plate* quantity ordered+ Delivery charge

    Use the information provided in the table below to calculte the delivery charge. The bill amount should be returned as -1, if any of the inputs is invalid

Distance in kms.	**Delivery charge in Rs per km.**
For first 3 kms	**0**
For next 3 kms	**3**
For the remaining	**6**

    Note: Initialize type of food, quantity and distance in kms with different values and test your program.

11. **Harley was booking flight tickets for the vacation trip. The ticket rates mentioned were as follows for the round-trip:**
    Rate per Child : 1/3rd of the rate per adult
    Service Tax: 7% of the ticket amount (including all passengers)
    As it was a holiday season, the airline also offered 10% discount on the final ticket cost (after inclusion of the service tax).
    Harley booked the tickets for 2 adults and 3 children. Find and display the total ticket cost of Harley.
    Test the program with different input values for number of adults and children.

12. Write a python program to find and display the product of three positive integer values (taken as input in list) based on the rule mentioned below:

It should display the product of the three values except when one of the integer value is 7. In that case, 7 should not be included in the product and the values to its left also should not be included.

If there is only one value to be considered, display that value itself. If no values can be included in the product, display -1.

Note: Assume that if 7 is one of the positive integer values, then it will occur only once. Refer the sample I/O given below

Sample Input	Expected Output
1, 5, 3	15
3, 7, 8	8
7, 4, 3	12
1, 5, 7	-1

13. Write a Python program which finds the maximum number from num1 to num2 (num2 inclusive) based on the following rules.:-

1. **num1 should be less than num2**
2. **Consider each number from num1 & num2 and add number to list iff below conditions are satisfied: -**
    a. **Sum of digits of the number are multiple of 3**
    b. **Number has only two digits**
    c. **Number is multiple of 3**

14. ARS gem store sells different variety of gems to customers. The dictionary of gems and its price[gems as key and price as value] are given below:-

Gem	Emerald	Ivory	Jasper	Ruby	Garnet
Price in Rs.	1760	2119	1599	3920	3999

Write a python program to calculate and display the bill amount to be paid by the customer based on the list of gems(gem_list) and quantity purchased(qty_list). Quantity purchased must be greater than 0. The customers are also entitled for discount based on gems purchased. Refer the table below for discount provide. In case more than one discount is applicable, the total discount % should be applied on the total bill amount.

Gems	Discount
Ivory	3%
Ruby	4%
Others	6%

In case of invalid values for any of quantity purchased or gems required display bill amount=-1.

Initialize required gem_list and qty_list containing names of gems to be purchased and required quantity of purchase for a customer and display the bill amount.

15. **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 scored by all the students.**

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