**Python programming**

1. A tech number has even number of digits.If the number is split in two equal halves , then the square of sum of these halves is equal to the number itself.write a program to generate and print all four digit tech numbers.

**Program:** def is\_tech\_number(number):

num\_str = str(number)

first\_half = int(num\_str[:2])

second\_half = int(num\_str[2:])

sum\_of\_halves = first\_half + second\_half

if sum\_of\_halves \*\* 2 == number:

return True

return False

tech\_numbers = []

for num in range(1000, 10000):

if is\_tech\_number(num):

tech\_numbers.append(num)

print("Four-digit Tech Numbers:")

for tech\_number in tech\_numbers:

print(tech\_number)

2.write a python program to remove duplicates present in the ID array.

**Program:** def remove\_duplicates(id\_array):

return list(set(id\_array))

id\_array = [101, 102, 103, 104, 102, 101, 105, 106, 103]

print("Original ID array:", id\_array)

id\_array\_no\_duplicates = remove\_duplicates(id\_array)

print("ID array after removing duplicates:", id\_array\_no\_duplicates)

3.write a program in python to read the elements of a one - dimensional array, compare the elements and find which are the largest two elements in a given array.

**Program:**

def find\_largest\_two\_elements(arr):

if len(arr) < 2:

return "Array should have at least two elements."

largest = second\_largest = float('-inf')

for num in arr:

if num > largest:

second\_largest = largest

largest = num

elif num > second\_largest and num != largest:

second\_largest = num

return largest, second\_largest

n = int(input("Enter the number of elements in the array: "))

arr = []

for i in range(n):

element = int(input(f"Enter element {i+1}: "))

arr.append(element)

largest, second\_largest = find\_largest\_two\_elements(arr)

if isinstance(largest, str):

print(largest)

else:

print(f"The largest element is: {largest}")

print(f"The second largest element is: {second\_largest}")

1. Define a class taximeter having the following description data members/instance varaiable int taxino-to store taxi number string name to store passengers name int km-to store number of kilometers travelled.

**Program:** class Taximeter:

def \_\_init\_\_(self, taxino, name, km):

self.taxino = taxino

self.name = name

self.km = km

def calculate\_fare(self):

base\_fare = 10

rate\_per\_km = 2

fare = base\_fare + (self.km \* rate\_per\_km)

return fare

def display\_trip\_details(self):

print(f"Taxi Number: {self.taxino}")

print(f"Passenger Name: {self.name}")

print(f"Distance Travelled: {self.km} km")

print(f"Total Fare: ${self.calculate\_fare():.2f}")

if \_\_name\_\_ == "\_\_main\_\_":

taxi\_number = int(input("Enter the taxi number: "))

passenger\_name = input("Enter the passenger's name: ")

kilometers\_travelled = int(input("Enter the number of kilometers travelled: "))

taxi\_trip = Taximeter(taxi\_number, passenger\_name, kilometers\_travelled)

taxi\_trip.display\_trip\_details()

1. write a program in python to convert decimal number to binary number.

**Program :** def decimal\_to\_binary(decimal\_number):

binary\_number = bin(decimal\_number)

return binary\_number[2:]

if \_\_name\_\_ == "\_\_main\_\_":

decimal\_number = int(input("Enter a decimal number: "))

binary\_result = decimal\_to\_binary(decimal\_number)

print(f"The binary equivalent of {decimal\_number} is: {binary\_result}")

6.you are given with an array arr which contains integer elements sort these elements in increasing order and print the middle element of the array.

**Program :** def find\_middle\_element(arr)

arr.sort()

middle\_index = len(arr) // 2

return arr[middle\_index]

arr = [3, 1, 4, 1, 5, 9, 2, 6, 5, 3, 5]

middle\_element = find\_middle\_element(arr)

print(middle\_element)

7.In daily share trading, a buyer buys shares in the morning and sells them on the same day. If the trader is allowed to make at most 2 transactions in a day, whereas the second transaction can only start after the first one is complete (buy\_>sell\_>buy\_>sell).given stock price throughout the day,find out the maximum profit that a share trader could have made.

**Program :** def maxProfit(prices):

n = len(prices)

if n == 0:

return 0

profit1 = [0] \* n

profit2 = [0] \* n

min\_price = prices[0]

for i in range(1, n):

min\_price = min(min\_price, prices[i]) # Track the minimum price so far

profit1[i] = max(profit1[i-1], prices[i] - min\_price) # Max profit with one transaction

max\_price = prices[n-1]

for i in range(n-2, -1, -1):

max\_price = max(max\_price, prices[i]) # Track the maximum price from the end

profit2[i] = max(profit2[i+1], max\_price - prices[i] + profit1[i])

before the last day)

return profit2[0]

prices = [3, 2, 6, 5, 0, 3]

print(maxProfit(prices)) # Output: 7

1. you are given with an array arr which contains integer elements.sort these elements in ascending order if any negative number is found it has to be replaced with the average of an array.

**Probem :**def sort\_and\_replace\_with\_average(arr):

if len(arr) == 0:

return arr # If the array is empty, just return it

total\_sum = sum(arr)

average = total\_sum / len(arr)

for i in range(len(arr)):

if arr[i] < 0:

arr[i] = average

arr.sort()

return arr

# Example usage:

arr = [3, -2, 5, -1, 8, -4]

result = sort\_and\_replace\_with\_average(arr)

print(result)