Question 1

Write a C-program to perform transpose of the given matrix

Answer

- **Code Preview**

```c
#include<stdio.h>
int main() {
    int a[10][10];
    int i,j,n;
    printf("Enter Size Of Matrix = ");
    scanf("%d",&n);
    printf("\n");
    for(i=0;i<n;i++) {
        for(j=0;j<n;j++) {
            printf("Value of A[%d][%d] = ",i,j);
            scanf("%d",&a[i][j]);
        }
    }
    printf("\nTransose Matrix\n");
    for(i=0;i<n;i++) {
        for(j=0;j<n;j++) {
            printf("%d\t",a[j][i]);
        } printf("\n");
    }
    return 0;
}
```

- **Output**

```
/tmp/JnOCUNHZAi.o
Enter Size Of Matrix = 3

Value of A[0][0] = 1
Value of A[0][1] = 2
Value of A[0][2] = 3
Value of A[1][0] = 4
Value of A[1][1] = 5
Value of A[1][2] = 6
Value of A[2][0] = 7
Value of A[2][1] = 8
Value of A[2][2] = 9

Transose Matrix
1   4   7
2   5   8
3   6   9
```

Question 2

Write a C-program to display add two matrices.

Answer

- **Code Preview**

```c
#include<stdio.h>
int main() {
    int a[10][10],b[10][10];
    int i,j,n=3;
    printf("Enter Value For First Matrix\n");
    for(i=0;i<n;i++) {
        for(j=0;j<n;j++) {
            printf("Value of A[%d][%d] = ",i,j);
            scanf("%d",&a[i][j]);
        }
    }
    printf("\nEnter Value For Second Matrix\n");
    for(i=0;i<n;i++) {
        for(j=0;j<n;j++) {
            printf("Value of B[%d][%d] = ",i,j);
            scanf("%d",&b[i][j]);
        }
    }
    printf("\nAddition Of Matrix\n");
    for(i=0;i<n;i++) {
        for(j=0;j<n;j++) {
            printf("%d\t",a[j][i]+b[i][j]);
        } printf("\n");
    }
    return 0;
}
```

- **Output**

```
Enter Value For Second Matrix
Value of B[0][0] = 9
Value of B[0][1] = 8
Value of B[0][2] = 7
Value of B[1][0] = 6
Value of B[1][1] = 5
Value of B[1][2] = 4
Value of B[2][0] = 3
Value of B[2][1] = 2
Value of B[2][2] = 1

Addition Of Matrix
10  12  14
8   10  12
6   8   10
```


Output Clear

```
/tmp/JnOCUNHZAi.o
Enter Value For First Matrix
Value of A[0][0] = 1
Value of A[0][1] = 2
Value of A[0][2] = 3
Value of A[1][0] = 4
Value of A[1][1] = 5
Value of A[1][2] = 6
Value of A[2][0] = 7
Value of A[2][1] = 8
Value of A[2][2] = 9
```

Question 3

Write a C-program to create a structure employee (eno, ename, dept, city, salary, hobbies[3]). Input information of employees and display information of the employees whose salary is greater than 10000.

Answer

- **Code Preview**

```c
#include <stdio.h>
#include <string.h>

struct Employee {
    int eno;
    char ename[50];
    char dept[50];
    char city[50];
    float salary;
    char hobbies[10];
};

int main() {
    int i, j, n;
    printf("Enter the number of employees: ");
    scanf("%d", &n);
    struct Employee emp[n];

    for(i = 0; i < n; i++) {
        printf("\nEnter details for employee %d:\n", i+1);
        printf("Employee Number: ");
        scanf("%d", &emp[i].eno);
```

```c
        printf("Employee Name: ");
        scanf("%s", emp[i].ename);
        printf("Department: ");
        scanf("%s", emp[i].dept);
        printf("City: ");
        scanf("%s", emp[i].city);
        printf("Salary: ");
        scanf("%f", &emp[i].salary);
        printf("Hobbies: ");
        scanf("%s", &emp[i].hobbies);
        }
```

```
    printf("\nEmployees with salary greater than 10000:\n");
    for(i = 0; i < n; i++) {
        if(emp[i].salary > 10000) {
        printf("Employee Number: %d\n", emp[i].eno);
        printf("Employee Name: %s\n", emp[i].ename);
        printf("Department: %s\n", emp[i].dept);
        printf("City: %s\n", emp[i].city);
        printf("Salary: %.2f\n", emp[i].salary);
        printf("Hobbies: %s\n", emp[i].hobbies);
        printf("\n");
        }
    }

    return 0;
}

```

- **Output**

```
Output                                                    Clear
/tmp/JnOCUNHZAi.o
Enter the number of employees: 2

Enter details for employee 1:
Employee Number: 1
Employee Name: Atul
Department: IT
City: Surat
Salary: 12000
Hobbies: Reading

Enter details for employee 2:
Employee Number: 2
Employee Name: Rahul
Department: Sales
City: Surat
Salary: 8000
Hobbies: Reading
```

```
Employees with salary greater than 10000:
Employee Number: 1
Employee Name: Atul
Department: IT
City: Surat
Salary: 12000.00
Hobbies: Reading
```

Question 4

Write a C program to create a menu driven program to perform following string operations using functions.

1. Merge two strings.

2. Count the total number of words in the given string.

3. Reverse the given string.

Answer

- **Code Preview**

```c
#include <stdio.h>
#include <string.h>

void mergeStrings(char *str1, char *str2) {
    strcat(str1, str2);
    printf("Merged string: %s\n", str1);
}

void countWords(char *str) {
    int count = 0, i;
    for(i = 0; str[i] != '\0'; i++) {
        if(str[i] == ' ' && str[i+1] != ' ')
            count++;
    }
    printf("Total number of words: %d\n", count + 1);
}

void reverseString(char *str) {
    int len = strlen(str);
    printf("Reversed string: ");
    for(int i = len - 1; i >= 0; i--) {
        printf("%c", str[i]);
```

```c
    }
    printf("\n");
}

int main() {
    char str1[100], str2[100];
    int choice;
        printf("\nMenu:\n");
        printf("1. Merge two strings\n");
        printf("2. Count the total number of words in the given
            string\n");
        printf("3. Reverse the given string\n");
        printf("4. Exit\n");
        printf("Enter your choice: ");
        scanf("%d", &choice);

        switch(choice) {
            case 1:
                printf("Enter first string: ");
                scanf("%s", str1);
                printf("Enter second string: ");
                scanf("%s", str2);
                mergeStrings(str1, str2);
                break;
            case 2:
                printf("Enter a string: ");
                scanf(" %[^\n]", str1);
                countWords(str1);
                break;
            case 3:
                printf("Enter a string: ");
                scanf("%s", str1);
                reverseString(str1);
                break;
            case 4:
                return 0;
            default:
                printf("Invalid choice\n");
        }

    return 0;
}
```

- **Output**

```
Menu:
1. Merge two strings
2. Count the total number of words in the given string
3. Reverse the given string
4. Exit
Enter your choice: 1
Enter first string: Hello
Enter second string: World!
Merged string: HelloWorld!
```

```
Menu:
1. Merge two strings
2. Count the total number of words in the given string
3. Reverse the given string
4. Exit
Enter your choice: 2
Enter a string: Hello World!
Total number of words: 2
```

```
Menu:
1. Merge two strings
2. Count the total number of words in the given string
3. Reverse the given string
4. Exit
Enter your choice: 3
Enter a string: Hello
Reversed string: olleH
```

Question 5

Write a C program to find factorial of the given number. (Use recursive function)

Answer

- **Code Preview**

```c
#include <stdio.h>

long long factorial(int n) {
    if(n == 0)
        return 1;
    else
        return n * factorial(n - 1);
}
int main() {
    int num;
    printf("Enter a Number: ");
    scanf("%d", &num);

    printf("Factorial of %d is \"%lld\"\n", num, factorial(num));

    return 0;
}
```

- **Output**

```
Output                                                    Clear

/tmp/WnTcMYY1Gi.o
Enter a Number: 5
Factorial of 5 is "120"
```

Question 6

Write a Python program to find maximum of two numbers.

Answer

- **Code Preview**

main.py

```
1  num1 = int(input("Enter First Number = "))
2  num2 = int(input("Enter Second Number = "))
3  print("The Maximum Number = ",max(num1, num2))
4
```

- **Output**

Shell

```
Enter First Number = 10
Enter Second Number = 20
The Maximum Number =  20
```

Question 7

Write a Python program to check if a Number is armstrong or not

Answer

- **Code Preview**

```
num1 = int(input("Enter Number = "))
temp = num1
b=0
while num1 > 0:
    a = num1%10
    b = b+(a*a*a)
    num1 //= 10
if temp==b:
    print(f"{temp} is an Armstrong number")
else:
    print(f"{temp} is not an Armstrong number")

```

- **Output**

```
Enter Number = 153
153 is an Armstrong number
```

```
Enter Number = 122
122 is not an Armstrong number
```

Question 8

Python program to print all prime number in an Interval.

Answer

- **Code Preview**

```
start = 1
end = 100
primes = []
print(f"Prime Numbers Between {start} and {end} : ")
for num in range(start, end + 1):
    if num > 1:  # primes are greater than 1
        for i in range(2, num):
            if num % i == 0:  # not a prime number
                break
        else:
            primes.append(str(num))

print(", ".join(primes))

```

- **Output**

```
Prime Numbers Between 1 and 100 :
2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71,
    73, 79, 83, 89, 97
```

Question 9

Write a Python program to Count the Number of each vowel in the given string and convert each vowel to upper case.

Answer

- **Code Preview**

```
s = input("Enter a string: ")
vowels = 'aeiou'
s = s.lower()

count = sum(s.count(vowel) for vowel in vowels)

for vowel in vowels:
    s = s.replace(vowel, vowel.upper())

print(f"Processed string: {s}")
print(f"Total count of vowels: {count}")

```

- **Output**

```
Enter a string: Hello World!
Processed string: hEllO wOrld!
Total count of vowels: 3
```

Question 10

Perform the following using Python programming: a="Python is an computer language taught in computer science " For above given string use necessary string functions and does as directed given below:

1. Display output "computer science".

2. Count the string data "computer" in above given string.

3. Display output "Pythonlanguage".

4. Separate each word as an element of a list

Answer

- **Code Preview**

```
1  a = "Python is an computer language taught in computer science"
2
3  # Display output "computer science".
4  print(a[-16:])
5
6  # Count the string data "computer" in above given string.
7  print(a.count("computer"))
8
9  # Display output "Pythonlanguage".
10 print(a[0:6]+a[22:30])
11
12 # Separate each word as an element of a list
13 print(a.split())
14
```

- **Output**

```
computer science
2
Pythonlanguage
['Python', 'is', 'an', 'computer', 'language', 'taught', 'in', 'computer',
    'science']
```

Question 11

Write a Python program that stores characters of word as a list element and removes vowels from the list e.g.:

Old list: ['C','o','m','p','u','t','e','r']

New list: ['C','m','p','t','r']

Answer

- **Code Preview**

```python
# Take a word as input from the user
word = input("Enter a word: ")

# Store characters of the word as a list element
old_list = list(word)

# Vowels
vowels = ['a', 'e', 'i', 'o', 'u', 'A', 'E', 'I', 'O', 'U']

# New list with vowels removed
new_list = [char for char in old_list if char not in vowels]

print("Old list:", old_list)
print("New list:", new_list)

```

- **Output**

```
Enter a word: Hello
Old list: ['H', 'e', 'l', 'l', 'o']
New list: ['H', 'l', 'l']
```

Question 12

Write a Python program to sum all the items in a list.

Answer

- **Code Preview**

```
numbers = list(map(int, input("Enter numbers separated by space: "
    ).split()))

total = sum(numbers)

print(f"Total = {total}")

```

- **Output**

```
Enter numbers separated by space: 10 20 20 30
Total = 80
```

Question 13

Write a Python program to get a list, sorted in increasing order by the last element in each tuple from a given list of non-empty tuples.

Answer

- **Code Preview**

```
tuples = [(2, 5), (1, 2), (4, 4), (2, 3), (2, 1)]

sorted_tuples = sorted(tuples, key=lambda x: x[-1])

print("Original list:", tuples)
print("Sorted list:", sorted_tuples)
```

- **Output**

```
Original list: [(2, 5), (1, 2), (4, 4), (2, 3), (2, 1)]
Sorted list: [(2, 1), (1, 2), (2, 3), (4, 4), (2, 5)]
```

Question 14

Write a Python program to remove duplicates from a list.

Answer

- **Code Preview**

```
numbers = list(map(int, input("Enter numbers separated by space: "
    ).split()))

numbers = list(set(numbers))

print("List after removing duplicates:", numbers)

```

- **Output**

```
Enter numbers separated by space: 12 34 12 35 67 34
List after removing duplicates: [67, 34, 35, 12]
```

Question 15

Write a Python program to append a list to the second list

Answer

- **Code Preview**

```
list1 = list(map(int, input("Enter numbers for the first list : "
    ).split()))
list2 = list(map(int, input("Enter numbers for the second list : "
    ).split()))

list2.extend(list1)

print("List after appending:", list2)

```

- **Output**

```
Enter numbers for the first list : 10 20 30
Enter numbers for the second list : 10 20 30
List after appending: [10, 20, 30, 10, 20, 30]
```