

Home work

Part 1.

Answer To the Question NO 1.4

/*4. Write a C program which can input a word and interchange the case of each letter. Then display the converted word. As example, if input is YouTube then output should be yOUTUBE*/

```
#include<stdio.h>

#include<string.h>

int main()
{
    char s[100];
    int i;
    printf("Enter a word : \n");
    gets(s);
    for(i=0;s[i]!='\0';i++)
    {
        if(s[i] >= 'a' && s[i] <= 'z')
        {
            s[i] = s[i] - 32;
        }
        else if(s[i] >= 'A' && s[i] <= 'Z')
        {
            s[i] = s[i] + 32;
        }
    }
    printf("\n%s",s);
```

```
}
```

Answer to the Question NO. 1.5

/*5. Write a C program which can input a word and display ratio between uppercase letter and lowercase letter.*/

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

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

```
int main()
```

```
{
```

```
    char s[100];
```

```
    int i,c=0,d=0;
```

```
    printf("Enter a word : \n");
```

```
    gets(s);
```

```
    for(i=0;s[i]!='\0';i++)
```

```
    {
```

```
        if(s[i] >= 'a' && s[i] <= 'z')
```

```
        {
```

```
            c++;
```

```
        }
```

```
        else if(s[i] >= 'A' && s[i] <= 'Z')
```

```
        {
```

```
            d++;
```

```
        }
```

```
    }
```

```
    printf("Ratio between uppercase letter and lowercase letter is %d : %d",d,c);
```

```
}
```

Answer to the Question NO. 1.6

//6. Input a word from the user and whenever you find a vowel replace it with "*"

```

#include<stdio.h>
#include<string.h>
int main()
{
    char str[50], i;
    printf("Enter a word : \n");
    gets(str);
    for(i=0; str[i]!='\0'; i++)
    {
        if(str[i]=='a' || str[i]=='e' || str[i]=='i' || str[i]=='o'
           || str[i]=='u' || str[i]=='A' || str[i]=='E' || str[i]=='I'
           || str[i]=='O' || str[i]=='U')
        {
            str[i] = '*';
        }
    }
    printf("\nNew String (after replacing vowel with *) = %s",str);
    return 0;
}

```

Part 2.

Answer to the Question NO. 2.1

/*1. Write a C program which can input some numbers from the user and store them into an array. Then display the maximum number from those input value. Also display how many numbers are equal to that maximum value.*/

```

#include<stdio.h>
int main()
{
    int n,num[100],i,max=num[0],count=0;

```

```

printf("Enter values of array : \n");
scanf("%d",&n);
printf("Enter %d values of arrays\n",n);
for(i=0;i<n;i++)
{
    scanf("%d",&num[i]);
}
for (i=0;i<n;i++)
{
    if (num[i]>max)
    {
        max=num[i];
    }
}
for (i=0;i<n;i++)
{
    if(num[i]== max)
    {
        count++;
    }
}
printf("Max value is %d\n",max);
printf("Total maximum number from array is %d",count);
return 0;
}

```

Answer to the Question NO. 2.2

/*2. Write a C program which can input some numbers into an array find how many of those are above average number.*/

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

```
int main()
```

```
{
```

```
    int n,num[100],i,sum=0,count=0;
```

```
    float average;
```

```
    printf("Enter values of array : \n");
```

```
    scanf("%d",&n);
```

```
    printf("Enter %d values of arrays\n",n);
```

```
    for(i=0;i<n;i++)
```

```
    {
```

```
        scanf("%d",&num[i]);
```

```
    }
```

```
    for (i=0;i<n;i++)
```

```
    {
```

```
        sum=sum+num[i];
```

```
    }
```

```
    average=sum/(float) n;
```

```
    for (i=0;i<n;i++)
```

```
    {
```

```
        if(num[i] > average)
```

```
        {
```

```
            count++;
```

```
        }
```

```
    }
```

```
    printf("Average number is %.2f\n",average);
```

```
printf("Total average number from array is %d",count);  
return 0;  
}
```

Answer to the Question NO. 2.4

/*4. Write a C program to input some numbers into an array. Then find how many numbers of that array is greater than first element of the array and how many numbers of that array is smaller than first element of the array.*/

```
#include<stdio.h>  
  
int main()  
{  
    int n,num[100],i,count1=0,count2=0;  
    printf("Enter values of array : \n");  
    scanf("%d",&n);  
    printf("Enter %d values of arrays\n",n);  
    for(i=0;i<n;i++)  
    {  
        scanf("%d",&num[i]);  
    }  
    for (i=0;i<n;i++)  
    {  
        if (num[i]>num[0])  
        {  
            count1++;  
        }  
    }  
    for (i=0;i<n;i++)  
    {
```

```

    if (num[i]<num[0])
    {
        count2++;
    }
}

printf ("\nFirst elements is %d\n\n",num[0]);
printf("%d numbers are greater than first element\n\n",count1);
printf("%d numbers are smaller than first element\n",count2);
return 0;
}

```

Part 3.

Answer to the Question NO. 3.2

/*2. Write a function which can find and calculate all the factors of a number and then return the number of factors. For example a function int factor(int n, int *ans) calculates the factor of n and stores the factors in ans array. The function returns the number of factors of n. Now you have to input the number from the main function and calculate the factors accordingly.*/

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

```
void Find_Factors(int Number)
```

```
{
```

```
    int i;
```

```
    for (i = 1; i <= Number; i++)
```

```
    {
```

```
        if(Number%i == 0)
```

```
        {
```

```
            printf("%d ", i);
```

```

    }
}

int main()
{
    int Number;

    printf("Please Enter number to Find Factors\n");
    scanf("%d", &Number);

    printf("\nFactors of a Number are:\n");
    Find_Factors(Number);

    return 0;
}

```

Answer to the Question NO. 3.4

/* 4. Write a function which can find and return summation of all factors of a number. After that, input a number and display summation of all factors of that number. */

```

#include <stdio.h>

int Find_Factors(int Number)
{
    int i,sum=0;

    for (i = 1; i <= Number; i++)

```



```

{
    if(Number%i == 0)
    {
        sum = sum + i;
    }
}
return sum;
}

int main()
{
    int Number,total;

    printf("Please Enter number to Find Factors\n");
    scanf("%d", &Number);
    total=Find_Factors(Number);
    printf("Summation of all Factors are:\n%d",total);

    return 0;
}

```

Answer to the Question NO. 3.5

/*5. Consider the following equation of velocity: $v^2 = u^2 + 2as$. Now, write a function that takes u, a and s as argument and return the value of v to caller function. */

```

#include<stdio.h>

float velocity(int u,int a,int s)
{

```

```

float v;

v=sqrt((u*u)+(2*a*s));

return v;
}

int main()
{
    int u, a, s;

    float sum;

    printf("Enter the value of u =\n");
    scanf("%d", &u);

    printf("Enter the value of a =\n");
    scanf("%d", &a);

    printf("Enter the value of s =\n");
    scanf("%d", &s);

    sum=velocity(u,a,s);

    printf("The velocity is %.2f",sum);

    return 0;
}

```

Part 4

Answer to the Question NO. 4.1

/*1. Write a C program which can input some mountains information (name, location, height) and display the average height of those mountains. Also display how many mountains are taller than average height. [The program should have a structure which can describe a mountain.*/

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

```

int main()
{
    struct mountains_information
    {

```

```
    char name[100],location[100];
    int height;
};

int n;

printf("Enter the Mountains_information what do you want?\n");

scanf("%d",&n);

struct mountains_information x[n];

int i,sum=0,count=0;

float average;

for (i=0;i<n;i++)
{
    printf("Enter the mountain name: \n");
    scanf("%s",x[i].name);
    printf("Enter the mountain location: \n");
    scanf("%s",x[i].location);
    printf("Enter height of the mountain: \n");
    scanf("%d",&x[i].height);
}

for (i=0;i<n;i++)
{
    sum = sum + x[i].height;
}

average=sum/(float)n;

for(i=0;i<n;i++)
{
    if(x[i].height>average)
    {
```

```

        count++;
    }
}

printf("Average heights of those mountain is %.2f\n",average);
printf("%d of mountains are taller than average height",count);

return 0;
}

```

Answer to the Question NO. 4.2

/*2. Write a C program which can input some country's information (name, area, population) and display the name of the biggest country. [The program should have a structure which can describe a country]*/

```

#include<stdio.h>

int main()
{
    struct countrys_information
    {
        char name [100];
        int area,population;
    };

    int n;

    printf("Enter the country's information what do you want?\n");
    scanf("%d",&n);

    struct countrys_information x[n];

    int i,max,p,len[100];

    for(i=0;i<n;i++)
    {
        printf("Enter the country name: \n");
        scanf("%s",x[i].name);
    }
}

```

```

    printf("Enter area of the country: \n");
    scanf("%d",&x[i].area);
    printf("Enter the population of the country: \n");
    scanf("%d",&x[i].population);
}
for (i=0;i<n;i++)
{
    len[i]=strlen(x[i].name);
}
for (i=0;i<n;i++)
{
    printf("%s string length is %d\n",x[i].name,len[i]);
}
max=len[0];
for(i=0;i<n;i++)
{
    if (len[i]>max)
    {
        max=len[i];
        p=i;
    }
}

printf("The name of the biggest country is %s",x[p].name);
}

```

Answer to the Question NO. 4.4

/*4. Make a structure of student type which contains name, age, CGPA. After that input some student's information and only name of the students whose CGPA is at least 3.75.*/

```

#include<stdio.h>

int main()
{
    struct students_information
    {
        char name[100];
        int age;
        float cgpa;
    };
    int n;
    printf("Enter the students information What do you want?\n");
    scanf("%d",&n);
    struct students_information x[n];
    int i,p;
    for(i=0;i<n;i++)
    {
        printf("Enter student name: \n");
        scanf("%s",x[i].name);
        printf("Enter student age: \n");
        scanf("%d",&x[i].age);
        printf("Enter the student cgpa: \n");
        scanf("%f",&x[i].cgpa);
    }
    for(i=0;i<n;i++)
    {
        if(x[i].cgpa>=3.75)
        {
            p=i;
            printf("%s\n",x[p].name);
        }
    }
}

```

```
    }  
}  
return 0;  
}
```

Part 5.

Answer to the Question NO. 5.2

/*2. Write a C program which can fill up a 3x3 matrix by user input and check whether the number odd number is more than number of even number.*/

```
#include<stdio.h>  
  
int main()  
{  
    int n,i,j,mat1[100][100],Even=0,Odd=0;  
    printf("Enter The value of matrix : ");  
    scanf("%d",&n);  
    printf("Enter %d*%d values of matrix\n",n,n);  
    for (i=0;i<n;i++)  
    {  
        for(j=0;j<n;j++)  
        {  
            scanf("%d",&mat1[i][j]);  
        }  
    }  
    printf("Matrix 1 is\n");  
    for (i=0;i<n;i++)  
    {  
        for(j=0;j<n;j++)  
        {
```

```
        printf("%5d",mat1[i][j]);
    }
    printf("\n");
}
for (i=0;i<n;i++)
{
    for(j=0;j<n;j++)
    {
        if(mat1[i][j]%2==0)
        {
            Even++;
        }
    }
}
printf("Even Number from the Matrix is %d\n",Even);
for (i=0;i<n;i++)
{
    for(j=0;j<n;j++)
    {
        if(mat1[i][j]%2!=0)
        {
            Odd++;
        }
    }
}
printf("Odd Number from the Matrix is %d\n",Odd);
if (Odd>Even)
```



```

{
    printf("Odd number is more than number of Even number\n");
}
else
{
    printf("Even number is more than number of Odd number\n");
}

return 0;
}

```

Answer to the Question NO. 5.3

/*3. Write a C program which can fill up a 3x3 matrix by user input and check whether sum of all row is odd or not.*/

```

#include<stdio.h>

int main()
{
    int n,i,j,mat1[100][100],sum=0;
    printf("Enter The value of matrix : ");
    scanf("%d",&n);
    printf("Enter %d*%d values of matrix\n",n,n);
    for (i=0;i<n;i++)
    {
        for(j=0;j<n;j++)
        {
            scanf("%d",&mat1[i][j]);
        }
    }
}

```

```
printf("Matrix 1 is\n");
for (i=0;i<n;i++)
{
    for(j=0;j<n;j++)
    {
        printf("%5d",mat1[i][j]);
    }
    printf("\n");
}
for (i=0;i<n;i++)
{
    for(j=0;j<n;j++)
    {
        sum = sum + mat1[i][j];
    }
}
printf("Sum of all row is %d\n",sum);
if (sum % 2 != 0)
{
    printf("sum of all row is odd\n");
}
else
{
    printf("sum of all row is even\n");
}
return 0;
}
```

Answer to the Question NO. 5.5

/*5. Write a C program that takes two $n \times n$ matrices A and B as input, and outputs A-B.*/

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

```
int main()
```

```
{
```

```
    int n,i,j,MatA[100][100],MatB[100][100],MatC[100][100];
```

```
    printf("Enter values of matrix : ");
```

```
    scanf("%d",&n);
```

```
    printf("Enter %d*%d values of matrix\n",n,n);
```

```
    for (i=0;i<n;i++)
```

```
    {
```

```
        for(j=0;j<n;j++)
```

```
        {
```

```
            scanf("%d",&MatA[i][j]);
```

```
        }
```

```
    }
```

```
    for (i=0;i<n;i++)
```

```
    {
```

```
        for(j=0;j<n;j++)
```

```
        {
```

```
            scanf("%d",&MatB[i][j]);
```

```
        }
```

```
    }
```

```
    printf("Matrix A is\n");
```

```
    for (i=0;i<n;i++)
```

```
    {
```

```
        for(j=0;j<n;j++)
```

```
{
    printf("%5d",MatA[i][j]);
}
printf("\n");
}
printf("Matrix B is\n");
for (i=0;i<n;i++)
{
    for(j=0;j<n;j++)
    {
        printf("%5d",MatB[i][j]);
    }
    printf("\n");
}
for (i=0;i<n;i++)
{
    for(j=0;j<n;j++)
    {
        MatC[i][j]=MatA[i][j]-MatB[i][j];
    }
}
printf("Subtract Matrix is\n");
for (i=0;i<n;i++)
{
    for(j=0;j<n;j++)
    {
        printf("%5d",MatC[i][j]);
```

```
    }  
    printf("\n");  
}  
  
return 0;  
}
```

THE END