Green University of Bangladesh
Department of Computer Science and Engineering(CSE)

Faculty of Sciences and Engineering

Semester: (Spring, Year:2021), B.Sc. in CSE (Day)

Course Title: Structured Programming

Course Code: CSE 104 Section: DE

Submission Date **:** 03-Sep-22

Course Teacher's Name **:Md. Mahabubur Rahman**

Student Details

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Problems: **Find factorial using a function .**

Code:

```c
#include<stdio.h>
#include<math.h>
int main()
{
    printf("Enter a number to find factorial: ");
    printf("\n The factorial = %d",fact());
    return 0;
}
int fact()
{
    int i,fact=1,n;
    scanf("%d",&n);
    for(i=1;i<=n;i++)
    {
        fact=fact*i;
    }
    return fact;
}

```

Output:

```
Enter a number to find factorial: 5

 The factorial = 120
Process returned 0 (0x0)   execution time : 3.465 s
Press any key to continue.
```

```
Enter a number to find factorial: 6

 The factorial = 720
Process returned 0 (0x0)   execution time : 1.225 s
Press any key to continue.
```

Problems: **Reverse array using function .**

Code:

```c
#include<stdio.h>
void rev(int arr[100],int n)
{
    int i,tem;
    for(i=0;i<n/2;i++)
    {
        tem=arr[i];
        arr[i]=arr[n-1-i];
        arr[n-1-i]=tem;
    }
}
int main()
{
    int arr[100],i,size;
    printf("Enter the size of array: ");
    scanf("%d",&size);
    printf("Enter the elements:\n");
    for(i=0;i<size;i++)
    {
        scanf("%d",&arr[i]);
    }
    rev(arr,size);
    printf("The reversing array:");
    for(i=0;i<size;i++)
    {
        printf("%d",arr[i]);
    }
    return 0;
}
```

Output:

```
Enter the size of array: 4
Enter the elements:
1
2
3
4
The reversing array:4321
Process returned 0 (0x0)   execution time : 5.100 s
Press any key to continue.
```

Problems: **Find maximum or minimum value of an array.**

Code:

```c
#include <stdio.h>
int find_max(int arr[], int size)
{
    int i;
    int max = -1;
    for (i = 0; i < size; i++)
    {
        if (arr[i] > max)
        {
            max = arr[i];
        }
    }
   return max;
}
int find_min(int arr[], int size)
{
    int i;
    int min = arr[0];
    for (i = 1; i < size; i++)
    {
        if (arr[i] < min)
        {
            min = arr[i];
        }
    }
    return min;
}

int main()
{
    int i, total;
    printf("Enter total no of elements : ");
    scanf("%d", &total);
    int myArray[total];
```

```
35      printf("Enter the elements: \n");
36      for (i = 0; i < total; i++)
37      {
38
39          scanf("%d", &myArray[i]);
40      }
41      int maximumNo = find_max(myArray, total);
42      int minimumNo = find_min(myArray, total);
43      printf("Maximum number in the array is :%d \n", maximumNo);
44      printf("Minimum number in the array is :%d \n", minimumNo);
45  }
46
```

Output:

```
Enter total no of elements : 5
Enter the elements:
2
4
6
8
10
Maximum number in the array is :10
Minimum number in the array is :2

Process returned 0 (0x0)   execution time : 75.765 s
Press any key to continue.
```

Problems: **Find Factorial of a Number Using Recursion.c**

Code:

```c
#include<stdio.h>
long int multnum(int n);
int main()
{
    int n;
    printf("Enter a number to find factorial:");
    scanf("%d",&n);
    printf("Factorial number = %ld",multnum(n));
    return 0;
}

    long int multnum(int n)
    {
        if (n>=1)
        return n*multnum(n-1);
    else
        return 1;
    }

```

Output:

```
Enter a number to find factorial:5
Factorial number = 120
Process returned 0 (0x0)   execution time : 2.988 s
Press any key to continue.
```

```
Enter a number to find factorial:4
Factorial number = 24
Process returned 0 (0x0)   execution time : 0.834 s
Press any key to continue.
```

Problems: **Find out exponential without power method.**

Code:

```c
#include<stdio.h>

int pow(int x,int y)
{
    int r=1,i;
    for(i=1;i<=y ;i++)
    {
        r=r*y;
    }
    return r;
}

int main()
{
    long long int b,p,r;
    printf("Enter a base:");
    scanf("%d",&b);
    printf("Enter a power:");
    scanf("%d",&p);
    printf("%d ^ %d = %d",b,p,pow(b,p));
    return 0;
}
```

Output:

```
Enter a base:2
Enter a power:3
2 ^ 3 = 27
Process returned 0 (0x0)   execution time : 0.839 s
Press any key to continue.
```

Problems: **Do addition and subtraction operation of matrices.**

Code:

```c
#include<stdio.h>
int r,c,j,i;
void sum(int [20][20],int [20][20]);
void sub(int [20][20],int [20][20]);
int main()
{
    int i,j,arr[20][20],brr[20][20];
    printf("Enter the same matrix (same row and columns)\n");
    printf("Enter the row and columns number :\n");
    scanf("%d%d",&r,&c);
    for(i=0;i<r;i++)
    {
        for(j=0;j<c;j++)
        {
            printf("Enter elements for 1st matrix on %d and %d : ",i,j);
            scanf("%d",&arr[i][j]);
        }
    }
    printf("Entered 1st matrix :\n");
    for(i=0;i<r;i++)
    {
        for(j=0;j<c;j++)
        {
            printf("%4d",arr[i][j]);
        }
        printf("\n");
    }
    for(i=0;i<r;i++)
    {
        for(j=0;j<c;j++)
        {
            printf("Enter elements for 2nd matrix on %d and %d : ",i,j);
            scanf("%d",&brr[i][j]);
        }
    }
    printf("Entered 2nd matrix:\n");
```

```
37      for(i=0;i<r;i++)
38      {
39          for(j=0;j<c;j++)
40          {
41              printf("%4d",brr[i][j]);
42          }
43          printf("\n");
44      }
45      sum(arr,brr);
46      sub(arr,brr);
47      return 0;
48  }
49
50  void sum(int arr[20][20],int brr[20][20])
51  {
52
53      printf("Addition:\n");
54      int crr[r][c];
55      for(int i=0;i<r;i++)
56      {
57          for(j=0;j<c;j++)
58          {
59           crr[i][j]=arr[i][j]+brr[i][j];
60           printf("%4d",crr[i][j]);
61          }
62          printf("\n");
63      }
64  }
65  void sub(int arr[20][20],int brr[20][20])
66  {
67      printf("Subtraction :\n");
68      int drr[r][c];
69      for(i=0;i<r;i++)
70      {
71          for(j=0;j<c;j++)
72          {
73              drr[i][j]=arr[i][j]-brr[i][j];
74              printf("%4d",drr[i][j]);
75          }
76          printf("\n");
77      }
78  }
79
```

Output:

```
Enter the same matrix (same row and columns)
Enter the row and columns number :
3
3
Enter elements for 1st matrix on 0 and 0 : 1
Enter elements for 1st matrix on 0 and 1 : 2
Enter elements for 1st matrix on 0 and 2 : 3
Enter elements for 1st matrix on 1 and 0 : 4
Enter elements for 1st matrix on 1 and 1 : 5
Enter elements for 1st matrix on 1 and 2 : 6
Enter elements for 1st matrix on 2 and 0 : 7
Enter elements for 1st matrix on 2 and 1 : 8
Enter elements for 1st matrix on 2 and 2 : 9
Entered 1st matrix :
   1   2   3
   4   5   6
   7   8   9
Enter elements for 2nd matrix on 0 and 0 : 1
Enter elements for 2nd matrix on 0 and 1 : 2
Enter elements for 2nd matrix on 0 and 2 : 3
Enter elements for 2nd matrix on 1 and 0 : 4
Enter elements for 2nd matrix on 1 and 1 : 5
Enter elements for 2nd matrix on 1 and 2 : 6
Enter elements for 2nd matrix on 2 and 0 : 7
Enter elements for 2nd matrix on 2 and 1 : 8
Enter elements for 2nd matrix on 2 and 2 : 9
Entered 2nd matrix:
   1   2   3
   4   5   6
   7   8   9
Addition:
   2   4   6
   8  10  12
  14  16  18
Subtraction :
   0   0   0
   0   0   0
   0   0   0

Process returned 0 (0x0)   execution time : 38.721 s
Press any key to continue.
```

Problems: **Do multiplication operation of matrices.**

Code:

```c
#include<stdio.h>
void multiply(int mat1[12][12],int mat2[12][12],int ,int ,int );

void main()
{
    int mat1[12][12],mat2[12][12];
    int i,j,k,m,n,p;
    printf("Enter the number of rows and columns for 1st matrix\n");
    scanf("%d%d",&m,&n);
    printf("Enter the elements of the 1st matrix\n");
    for(i=0;i<m;i++)
    {
        for(j=0;j<n;j++)
        {
            scanf("%d",&mat1[i][j]);
        }
    }
    printf("Enter the number of columns for 2nd matrix\n");
    scanf("%d",&p);
    printf("Enter the elements of the 2nd matrix\n");
    for(i=0;i<n;i++)
    {
        for(j=0;j<p;j++)
        {
            scanf("%d",&mat2[i][j]);
        }
    }

    printf("The 1st matrix\n");
    for(i=0;i<m;i++)
    {
        for(j=0;j<n;j++)
        {
            printf("%d\t",mat1[i][j]);
        }
        printf("\n");
```

```c
    }
    printf("The 2nd matrix\n");
    for(i=0;i<n;i++)
    {
        for(j=0;j<p;j++)
        {
            printf("%d\t",mat2[i][j]);
        }
        printf("\n");
    }
    multiply(mat1,mat2,m,n,p);
}

void multiply(int mat1[12][12],int mat2[12][12],int m,int n,int p)
{
    int mul[12][12],i,j,k;
    for(i=0;i<m;i++)
    {
        for(j=0;j<p;j++)
        {
            mul[i][j]=0;
            for(k=0;k<n;k++)
            {
                mul[i][j]=mul[i][j]+mat1[i][k]*mat2[k][j];
            }
        }
    }

    printf("The resultant matrix formed on multiplying the two matrices\n");
    for(i=0;i<m;i++)
    {
        for(j=0;j<p;j++)
        {
            printf("%d\t",mul[i][j]);
        }
        printf("\n");
    }
}
```

Output:

```
Enter the number of rows and columns for 1st matrix
3
3
Enter the elements of the 1st matrix
1
2
3
4
5
6
7
8
9
Enter the number of columns for 2nd matrix
3
Enter the elements of the 2nd matrix
1
2
3
4
5
6
7
8
9
```

```
The 1st matrix
1       2       3
4       5       6
7       8       9
The 2nd matrix
1       2       3
4       5       6
7       8       9
The resultant matrix formed on multiplying the two matrices
30      36      42
66      81      96
102     126     150

Process returned 3 (0x3)   execution time : 12.894 s
Press any key to continue.
```

I am really trying to solve those problems too but I cannot succeed. sorry sir
Problems:
{

ASCII value of a character

Check an alphabet is vowel or consonant

Convert upper case to lower case and lower case to upper case

}