

**Jaypee University of Engineering and Technology,
Guna {M.P.}**

**Department of Computer Science and Engineering
Object Oriented Programming Lab (18B17CI271)**

Lab-1

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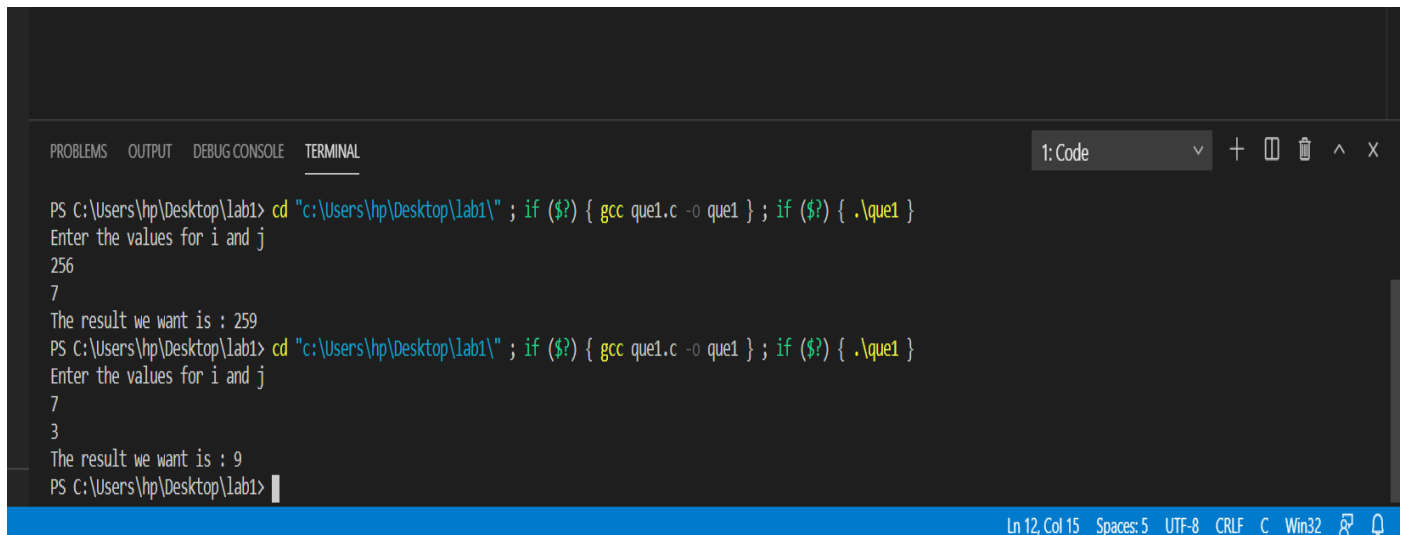
Question 1.

Write a program to round off an integer “i” to the next largest multiple of another integer “j”. For example, 256 days when rounded off to the next largest multiple divisible by a week result into 259.

```
#include<stdio.h>

int main()
{
    int i,j;
    printf("Enter the values for i and j \n");
    scanf("%d%d",&i,&j);
    if(i%j==0)
        printf("The result we want is : %d",i);
    else
        printf("The result we want is : %d",i+j-(i%j));
    return 0;
}
```

Output :



```
PS C:\Users\hp\Desktop\lab1> cd "c:\Users\hp\Desktop\lab1" ; if ($?) { gcc que1.c -o que1 } ; if ($?) { .\que1 }
Enter the values for i and j
256
7
The result we want is : 259
PS C:\Users\hp\Desktop\lab1> cd "c:\Users\hp\Desktop\lab1" ; if ($?) { gcc que1.c -o que1 } ; if ($?) { .\que1 }
Enter the values for i and j
7
3
The result we want is : 9
PS C:\Users\hp\Desktop\lab1> 
```

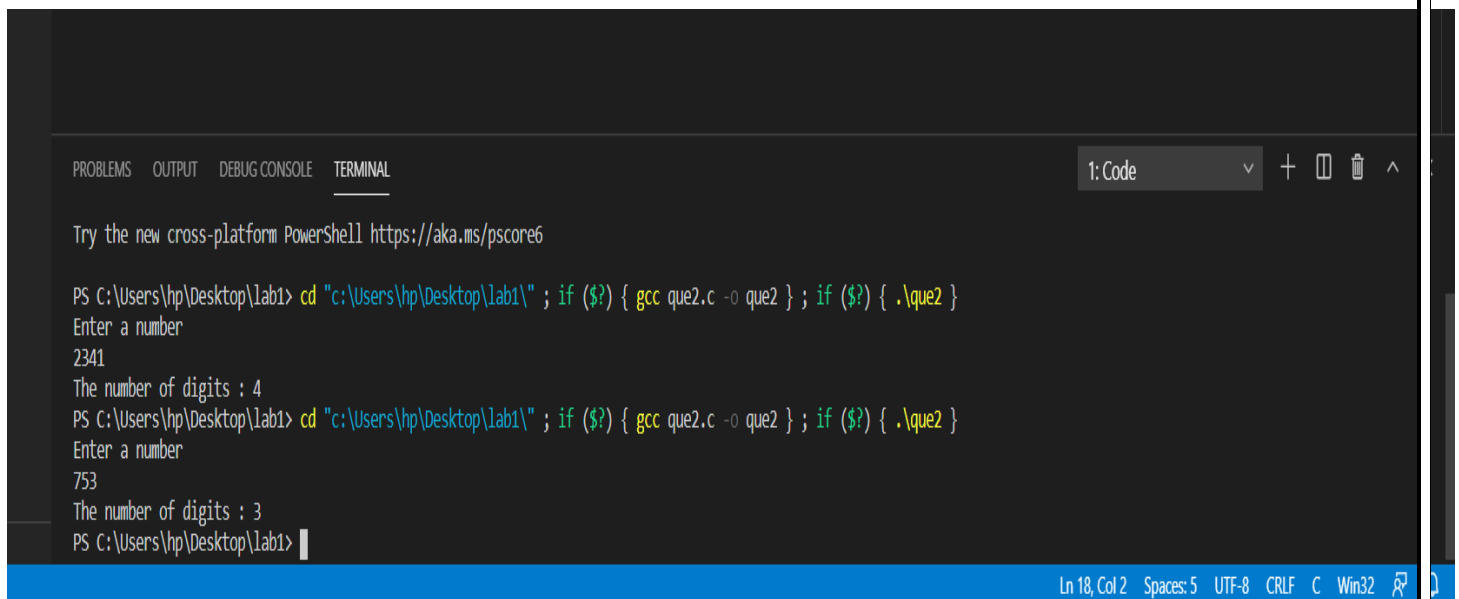
Question 2.

A number is entered through the keyboard. The number may contain 1,2,3,4, or 5 digits. Write a program to find the number of digits in the number.

```
#include<stdio.h>

int main()
{
    int num,count=0;
    printf("Enter a number \n");
    scanf("%d",&num);
    while(num!=0)
    {
        num=num/10;
        count++;
    }
    if(num<=5)
    printf("The number of digits : %d",count);
    else
    printf("Your number is not valid here. try again!");
    return 0;
}
```

Output :



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL 1: Code + [ ] [X] ^

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\hp\Desktop\lab1> cd "c:\Users\hp\Desktop\lab1\" ; if ($?) { gcc que2.c -o que2 } ; if ($?) { .\que2 }
Enter a number
2341
The number of digits : 4
PS C:\Users\hp\Desktop\lab1> cd "c:\Users\hp\Desktop\lab1\" ; if ($?) { gcc que2.c -o que2 } ; if ($?) { .\que2 }
Enter a number
753
The number of digits : 3
PS C:\Users\hp\Desktop\lab1> 
```

Ln 18, Col 2 Spaces: 5 UTF-8 CRLF C Win32

Question 3.

Write a program which finds a four-digit number AABB which is a perfect square. A and B represent different digits. For example, 7744 is a four-digit perfect square number which is also satisfying the condition AABB i.e. first two digits (AA=77) are same and last two digits (BB=44) are same.

```
#include <stdio.h>
#include <math.h>
int perfectsquare(int);
int check(int);
int main()
{
    int n;
    printf("Enter a 4-digit number in the form AABB : ");
    scanf("%d", &n);
    int ch = check(n);
    switch (ch)
    {
        case 0:
            printf("Invalid Input");
            break;

        case 1:
            {
                if (perfectsquare(n))
                    printf("%d satisfies the condition and is a Perfect Square.", n);
                else
                    printf("%d satisfies the condition but it is not a Perfect Square.", n);
                break;
            }
    }
}

int perfectsquare(int x)
{
    int m = sqrt(x);
    if (m * m == x)
        return 1;
    else
        return 0;
}

int check(int a)
{
    int r1 = a % 100;
    int r2 = a / 100;
    if (r1 % 11 == 0 && r2 % 11 == 0)
        return 1;
    else
        return 0;
}
```

Output :

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Try the new cross-platform PowerShell <https://aka.ms/pscore6>

```
PS C:\Users\hp\Desktop\lab1> cd "c:\Users\hp\Desktop\lab1\" ; if ($?) { gcc que3.c -o que3 } ; if ($?) { .\que3 }
Enter a 4-digit number in the form AABB : 7744
7744 satisfies the condition and is a Perfect Square.
PS C:\Users\hp\Desktop\lab1> █
```

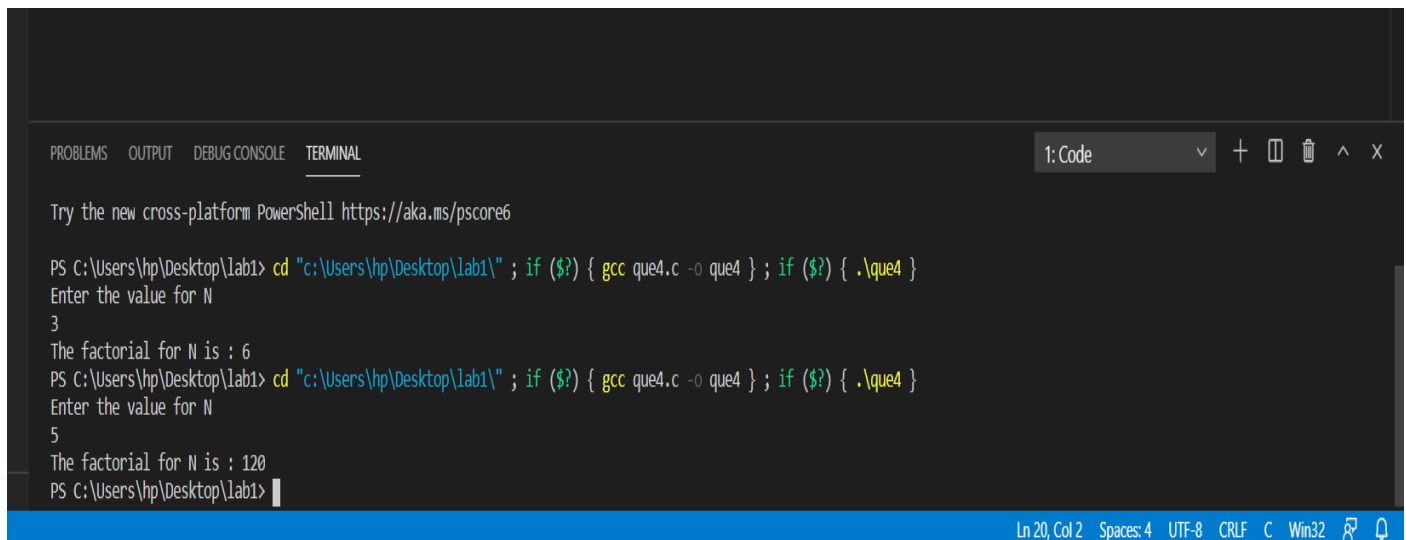
Question 4.

Write a program to calculate factorial of a number N through recursion.

```
#include<stdio.h>
int fact(int num)
{
    if(num==0)
        return 1;
    else if(num==1)
        return 1;
    else
        return num*fact(num-1);
}

int main()
{
    int n;
    printf("Enter the value for N\n");
    scanf("%d",&n);
    printf("The factorial for N is : %d",fact(n));
    return 0;
}
```

Output :



The screenshot shows a Visual Studio Code interface with a terminal window open. The terminal displays the following text:

```
Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\hp\Desktop\lab1> cd "c:\Users\hp\Desktop\lab1\" ; if ($?) { gcc que4.c -o que4 } ; if ($?) { .\que4 }
Enter the value for N
3
The factorial for N is : 6
PS C:\Users\hp\Desktop\lab1> cd "c:\Users\hp\Desktop\lab1\" ; if ($?) { gcc que4.c -o que4 } ; if ($?) { .\que4 }
Enter the value for N
5
The factorial for N is : 120
PS C:\Users\hp\Desktop\lab1> 
```

The terminal window has tabs for PROBLEMS, OUTPUT, DEBUG CONSOLE, and TERMINAL. The TERMINAL tab is active. The status bar at the bottom indicates the file is '1: Code', the line is 'Ln 20, Col 2', the encoding is 'UTF-8', the line ending is 'CRLF', and the window title is 'Win32'.

Question 5.

Write a program which takes a string as input from user and returns the length of that string without using any string library functions.

```
#include <stdio.h>

int main()
{
    int i=1;
    char str[100];
    printf("Enter the string\n");
    gets(str);
    for ( i = 0; str[i] != '\0'; i++);
    printf("The string length is : %d", i);
    return 0;
}
```

Output:



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL 1: Code + [] {} ^ x

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\hp\Desktop\lab1> cd "c:\Users\hp\Desktop\lab1" ; if ($?) { gcc que5.c -o que5 } ; if ($?) { .\que5 }
Enter the string
Palash Mishra 2018172
The string length is : 21
PS C:\Users\hp\Desktop\lab1> cd "c:\Users\hp\Desktop\lab1" ; if ($?) { gcc que5.c -o que5 } ; if ($?) { .\que5 }
Enter the string
Lab 1 Exercise
The string length is : 14
PS C:\Users\hp\Desktop\lab1> |
```

Ln 11, Col 2 Spaces: 4 UTF-8 CRLF C Win32

Question 6.

6. Write a pointer version of the function `strcat(s,t)` which concatenates the string `t` to the end of string `s`.

```
#include <stdio.h>
void Strcat(char *s, char *t)
{
    int i = 0, j = 0;
    while (s[i] != '\0')
    {
        i++;
    }
    while (t[j] != '\0')
    {
        s[i] = t[j];
        i++;
        j++;
    }
    s[i] = '\0';
    puts(s);
}

int main()
{
    char s[50], t[50];
    printf("Enter the strings \n");
    gets(s);
    gets(t);
    Strcat(s, t);

    return 0;
}
```

Output:

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

1: Code



```
PS C:\Users\hp\Desktop\lab1> cd "C:\Users\hp\Desktop\lab1\" ; if ($?) { gcc que6.c -o que6 } ; if ($?) { .\que6 }
Enter the strings
sachin
tendulkar
sachintendulkar
PS C:\Users\hp\Desktop\lab1> cd "C:\Users\hp\Desktop\lab1\" ; if ($?) { gcc que6.c -o que6 } ; if ($?) { .\que6 }
Enter the strings
palash
mishra
palashmishra
PS C:\Users\hp\Desktop\lab1> 
```

Ln 29, Col 2 (418 selected) Spaces: 4 UTF-8 CRLF C Win32

Question 7.

7. Write the function `strend(s,t)`,
which returns 1 if the string `t` occurs at the end of
the string `s`, and zero otherwise.

Sample Test case1:

Input:

`s="Object Oriented Programming using C++"`

`t="Using C++"`

Output: 1

Sample Test case2:

Input:

`s="Object Oriented Programming using C++"`

`t="Programming"`

Output: 0

Output:

```
Enter the strings
Object Oriented Programming using C++
Using C++
1
PS C:\Users\hp\Desktop\lab1> cd "c:\Users\hp\Desktop\la
Enter the strings
Object Oriented Programming using C++
Programming
0
PS C:\Users\hp\Desktop\lab1> █
```

```
#include <stdio.h>
#include <string.h>
int Strend(char *s, char *t, int ls,int lt)
{   int j=0,i=ls-lt;
    char str[50];
    while(i<=ls)
    {
        str[j]=s[i];
        i++;
        j++;
    }
    str[j]='\0';
    if(strncmp(t,str)==0)
        return 1;
    else
        return 0;
}

int main()
{
    char s[50], t[50];
    printf("Enter the strings \n");
    gets(s);
    gets(t);
    int len_t = strlen(t),len_s=strlen(s);

    printf("%d",Strend(s, t, len_s,len_t));

    return 0;
}
```


Advance practice problems

1. Write a program to find K'th smallest and K'th largest element in unsorted array.

Sample Test case1:

Input:

A[]=4, 5, 60, 70, 33, 44

K=2

Output: 2nd smallest number is 5 and 2nd largest number is 60

Sample Test case2:

Input:

A[]=2, 46, 56, 68, 3, 34, 489, 457, 4545, 100

K=5

Output: 5th smallest number is 56 and 5th largest number is 68

```
#include <stdio.h>
int Min(int *, int);
int Max(int *, int);
int main()
{
    int n, K, temp;
    printf("Enter Length of Array : ");
    scanf("%d", &n);
    temp = n;
    int arr[n];
    for (int i = 0; i < n; i++)
    {
        printf("Enter number %d : ", i + 1);
        scanf("%d", &arr[i]);
    }
    printf("Enter value of K : ");
    scanf("%d", &K);
    int min[K], max[K];

    for (int i = 0; i < K; i++)
    {
        min[i] = Min(arr, n--);
    }
    n = temp;
    for (int i = 0; i < K; i++)
    {
        max[i] = Max(arr, n--);
    }
    printf("\n%d Smallest number is %d", K, min[K - 1]);
    printf("\n%d Largest number is %d", K, max[K - 1]);
    return 0;
}

int Min(int *arr, int x)
{
    int min = arr[0];
    for (int i = 1; i < x; i++)
    {
        if (arr[i] < min)
            min = arr[i];
    }
    return min;
}

int Max(int *arr, int x)
{
    int max = arr[0];
    for (int i = 1; i < x; i++)
    {
        if (arr[i] > max)
            max = arr[i];
    }
    return max;
}
```

```

int min = arr[0], a, index;
for (int i = 0; i < x; i++)
{
    if (min >= arr[i])
    {
        min = arr[i];
        index = i;
    }
}
a = arr[x - 1];
arr[x - 1] = arr[index];
arr[index] = a;
return min;
}

int Max(int *arr, int x)
{
    int max = arr[0], a, index;
    for (int i = 0; i < x; i++)
    {
        if (max <= arr[i])
        {
            max = arr[i];
            index = i;
        }
    }
    a = arr[x - 1];
    arr[x - 1] = arr[index];
    arr[index] = a;
    return max;
}

```

Output:

Try the new cross-platform PowerShell <https://aka.ms/powershell>

```

PS C:\Users\hp\Desktop\lab1> cd "c:\Users\hp\Desktop\lab1\" ; if ($?) { gcc question8.c -o question8 } ; if ($?) { .\question8 }
Enter Length of Array : 6
Enter number 1 : 4
Enter number 2 : 5
Enter number 3 : 60
Enter number 4 : 70
Enter number 5 : 33
Enter number 6 : 44
Enter value of K : 2

2 Smallest number is 5
2 Largest number is 60
PS C:\Users\hp\Desktop\lab1>

```