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: CSBS

PAPER NAME : PROGRAMMING FOR PROBLEM SOLVING LAB

PAPER CODE : CSEN1051

## WEEK 2 : Lab Assignment

(1) #include &lt;stdio.h&gt;

int main()

{

int marks;

printf("Enter marks out of 100 \n");

scanf("%d", &amp;marks);

if (marks &gt;= 90)

printf("O \n");

else if (marks &gt;= 80 &amp;&amp; marks &lt; 90)

printf("E \n");

else if (marks &gt;= 70 &amp;&amp; marks &lt; 80)

printf("A \n");

else if (marks &gt;= 60 &amp;&amp; marks &lt; 70)

printf("B \n");

else if (marks &gt;= 50 &amp;&amp; marks &lt; 60)

printf("C \n");

else if (marks &gt;= 40 &amp;&amp; marks &lt; 50)

printf("D \n");

else

printf("F \n");

return 0;

}

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```
doesitmatter@Anonymous-2:~$ cd Desktop/C/"Lab Assignment 2"  
doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2$ gcc Marks.c -o m  
doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2$ ./m
```

Enter the marks out of 100

94

0

```
doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2$ ./m
```

Enter the marks out of 100

84

E

```
doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2$ ./m
```

Enter the marks out of 100

74

A

```
doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2$ ./m
```

Enter the marks out of 100

64

B

```
doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2$ ./m
```

Enter the marks out of 100

54

C

```
doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2$ ./m
```

Enter the marks out of 100

44

D

```
doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2$ █
```

(2) #include <stdio.h>

int main() # include <math.h>

int main()

{

float a, b, c;

printf("Enter the coefficients \n");

scanf ("%f", &a);

scanf ("%f", &b);

scanf ("%f", &c);

float det = pow (b, 2) - 4\*a\*c;

if (det > 0.0)

{

float r1 = (-b + sqrt(det)) / (2.0\*a);

float r2 = (-b - sqrt(det)) / (2.0\*a);

printf ("Root 1 = %0.2f \n Root 2 = %0.2f \n", r1, r2);

} else if (det == 0.0)

{

float r = -b / (2.0\*a);

float r3 = +b / (2.0\*a);

printf ("Root is %0.2f and %0.2f \n", r, r3);

} else if (det < 0.0)

{

float real = -b / (2.0\*a);

float img = sqrt(-det) / (2.0\*a);

printf ("Root is %0.2f + %0.2fi \n", real, img);

} return 0;

}

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doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2\$ ./q

Enter the coefficients

2 5 3

Root 1 = -1.00

Root 2 = -1.50

doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2\$ ./q

Enter the coefficients

1 2 1

Root is -1.00 and 1.00

doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2\$ ./q

Enter the coefficients

3 5 7

Root is -0.83 + 1.28i

doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2\$ █

(3) #include <stdio.h>  
 #include <math.h>  
 int factorial (int n)  
{

```
int f = 1;
for (int i = 1; i <= n; i++)
    f *= i;
return f;
```

int main()

{

int x, n;

printf("Enter the value of x ");

scanf ("%d", &x);

printf("Enter the value of n ");

scanf ("%d", &n);

float s = 0.0, k = 1.0, c = 0.0;

for (int i = 1; i <= n; i++)

{

s = s + ((pow(x, c)) / factorial(c)) \* k;

k = -k;

c++;

}

printf ("%0.2f\n", s);

return 0;

}

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**doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2\$ ./s**

Enter the value of x 2

Enter the value of n 2

-1.00

**doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2\$ █**

(4) #include <stdio.h>

int main()

{

int n;

printf("Enter the number of rows(m)\n");  
scanf("%d", &n);

int c=n;

if (m <= 50)

for (int i=1; i<=n; i++)

{

int r=i;

for (int j=1; j<c; j++)

printf("\t");

c--;

for (int j=1; j<=i; j++)

printf("%d\t", r);

r++;

r=r-1;

for (int j=1; j<i; j++)

r--;

printf("%d\t", r);

printf("\n");

return 0;

}

doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2\$ ./

Enter the number of rows:

7

|    |    |    |    |    |    |    |   |
|----|----|----|----|----|----|----|---|
|    |    |    | 1  |    |    |    |   |
|    | 2  | 3  | 2  |    |    |    |   |
| 3  | 4  | 5  | 4  | 3  |    |    |   |
| 5  | 6  | 7  | 6  | 5  | 4  |    |   |
| 7  | 8  | 9  | 8  | 7  | 6  | 5  |   |
| 9  | 10 | 11 | 10 | 9  | 8  | 76 |   |
| 11 | 12 | 13 | 12 | 11 | 10 | 98 | 7 |

元

doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2

(5) // This program accurately prints factorial for single digit numbers.

```
#include <stdio.h>
int main()
{
    int f=1;
    int n;
    printf("Enter a number ");
    scanf("%d",&n);
    if(n<10)
    {
        for(int i=1;i<=n;i++)
        {
            f*=i;
            printf("The factorial of %d is %d\n",n,f);
        }
    }
    else
        printf("Not in the domain of program |n|");
    return 0;
}
```

If we use this program for larger numbers, it will ~~to~~ return garbage value as the datatype ~~int~~ cannot store such large values. We can use long, long long datatypes, but they will also run out of space eventually.

Solution: Using arrays to store the digits of factorial values.

```
doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2$ ./Fact
```

```
Enter a number 5
```

```
The factorial of 5 is 120
```

```
doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2$ ./Fact
```

```
Enter a number 10
```

```
Not in the domain of program
```

```
doesitmatter@Anonymous-2:~/Desktop/C/Lab Assignment 2$ █
```

## Home Assignment - 2

(1) // Pascal triangle

#include &lt;stdio.h&gt;

int factorial(int num)

{

int f = 1;

for (int i = 1; i &lt;= num; i++)

f = f \* i;

return f;

}

int combination(int n, int r)

{

int m, c = 0; int x = factorial(n) / (factorial(r) \* factorial((n - r));

printf("Enter r\n"); return x;

}

int main()

{

int n, c = 0;

printf("Enter the number of rows \n");

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

for (int i = 1; i &lt;= n; i++)

{

for (int j = c + 1; j &lt; n; j++)

printf(" ");

for (int f = 0; f &lt;= c; f++)

printf(" %d ", combination(c, f));

c++;

}

return 0;

}

```
doesitmatter@Anonymous-2:~$ cd Desktop/C/"Home Assignment 2"
doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2$ ./p1
Enter the number of rows
5
      1
     1 1
    1 2 1
   1 3 3 1
  1 4 6 4 1
doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2$
```

## (3) // fibonacci

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

```
int main()
{
```

```
    int a=0, b=1, n;
```

```
    printf("Enter the number of fibonacci digits you want to print  
n");
```

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

```
    printf("%d %d", a, b);
```

```
    for (int i=3; i<=n; i++)
```

```
{
```

```
    int c=a+b;
```

```
    a=b;
```

```
    b=c;
```

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

```
}
```

```
return 0;
```

```
}
```

## (4) // Marks program

```
int main() #include <stdio.h>
```

```
{ int main()
```

```
{ int m;
```

```
printf("Enter marks ");
```

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

```
char g;
```

```
g = (m >= 90 ? 'O' : ((m >= 80 && m <= 89) ? 'E' :
```

```
((m >= 70 && m <= 79) ? 'A' : ((m >= 60 && m
```

```
<= 69) ? 'B' : ((m >= 50 && m <= 59) ? 'C' :
```

```
((m >= 40 && m <= 49) ? 'D' : 'F'))));
```

```
printf("Grade: %.2f\n", g);
```

```
return 0;
```

```
}
```

```
doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2$ ./Fibonacci
```

```
Enter the number of fibonacci digits you want to print
```

```
2
```

```
0 1 doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2$ ./Fibonacci
```

```
Enter the number of fibonacci digits you want to print
```

```
5
```

```
0 1 1 2 3 doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2$ █
```

```
doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2$ ./cond
Enter marks 94
Grade: 0
doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2$ ./cond
Enter marks 84
Grade: E
doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2$ ./cond
Enter marks 74
Grade: A
doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2$ ./cond
Enter marks 64
Grade: B
doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2$ ./cond
Enter marks 54
Grade: C
doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2$ ./cond
Enter marks 44
Grade: D
doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2$ ./cond
Enter marks 34
Grade: F
doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2$ █
```

(5) #include <stdio.h>

int main()

{

for(int i=1; i<=5; i++)

    for(int j=4; j>=i; j--)

        printf(" ");

    for(int j=1; j<=i; j++)

        printf("%d ", i);

    printf("\n");

}

return 0;

}

(6) #include <stdio.h>

int main()

{

int n;

printf("Enter the value of n ");

scanf("%d", &n);

float s=0.0;

for(int i=1; i<=n; i++)

    s = s + (1.0/i);

printf("%.2f", s);

return 0;

}

doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2\$ ./Pattern2

```
1  
2 2  
3 3 3  
4 4 4 4  
5 5 5 5 5
```

doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2\$ █

doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2\$ ./Series2

Enter the value of n 2

1.50doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2\$ █

(6) # include <stdio.h>

int main()

{

int n, s=0, rev=0;  
printf ("Enter a number ");  
scanf ("%d", &n);

int r=n

while (r>0)

{

int r = c/10;

s = s+r;

rev = rev\*10+r

c = 10;

}

printf ("Sum of digits = %d\n", s);

if (rev == n)

printf ("Palindrome\n");

else

printf ("Not Palindrome\n");

return 0;

}

doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2\$ ./Palindrome

Enter a number 12321

Sum of digits = 9

Palindrome

doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2\$ ./Palindrome

Enter a number 123

Sum of digits = 6

Not Palindrome

doesitmatter@Anonymous-2:~/Desktop/C/Home Assignment 2\$ █