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1	**Write a program to calculate the grade of the student according to the specified marks.** Grade A:Marks(>85 and <=100) Grade B:Marks(>60 and <=85) Grade C:Marks(>40 and <=60) Grade D:Marks(>30 and <=40) Fail: Marks(<30) **Sample Input:** Enter your marks:60 **Sample Output:** You got grade C

	Program:
	
	**#include<stdio.h>
	int main()
	{
	int n;
	printf("Enter your marks: ");
	scanf("%d",&n);
	if(n>85 && n<=100)
	printf("Grade A");
	else if(n>60 && n<=85)
	printf("Grade B");
	else if (n>40 && n<=60)
	printf("Grade C");
	else if (n>30 && n<=40)
	printf("Grade D");
	else if (n<30 && n>=0)
	printf("Fail");
	else
	printf("Invalid input");
	return 0;**

	}

	Output Screenshot:
	`D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>gcc Program1.c`
	
	`D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a`
	`Enter your marks: 85`
	`Grade B`
	`D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a`
	`Enter your marks: 40`
	`Grade D`
	`D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a`
	`Enter your marks: 111`
	`Invalid input`
	`D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a`
	`Enter your marks: -30`
	`Invalid input`
	`D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a`
	`Enter your marks: 88`
	`Grade A`

2	**Write a Program to convert all characters in a given line from lower case to upper case.** **Sample Input:** Enter characters to convert case I am student of 2nd Semester! **Sample Output**: I AM STUDENT OF 2ND SEMESTER!
	Program: **#include<stdio.h>** **#include<conio.h>** **#include<string.h>** **#include<stdlib.h>** **int main()** **{** **char s[50]; int i;** **printf("Enter a string of characters to be converted to upper case: ");** **gets(s);** **printf("%s\n",s);**

```
        for(i=0;i<strlen(s);i++)
                if(s[i]!=' ')
                        s[i]=s[i]-32;
        printf("%s",s);
        return 0;
}
```

Output Screenshot:

```
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>gcc program2.c

D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a
Enter a string of characters to be converted to upper case: c programming is very fun
c programming is very fun
C PROGRAMMING IS VERY FUN
```

3 **Write a C program using bitwise operators for the following:**

i) check whether specified bit is set or not

ii) set the specified bit and print the result

iii) clear the specified bit and print the result

Sample Input/Output:

Enter the number which you want check

25

Input number is 25

Enter the bit position, starts from zero

2

bit is not set

Enter the bit position, which you want to set

4

set : 16

The number after set is 25

Enter the bit position, which bit you want to clear

3

set : 0

The number after clear is 17

Program:

```
#include<stdio.h>
#include<stdlib.h>
int main()
{
        int n,pos,pset,n1,cbit,n2;
        printf("Enter the number which you want to check ");
        scanf("%d",&n);
        n2 == n;
        printf("Enter the bit position, to check whether bit position is set or not(starts
from 0) ");
        scanf("%d",&pos);
        n1 =  n>>(pos-1);
        if(n1&1==1)
                printf("Bit position is set\n");
        else
                printf("Bit position is not set\n");
        printf("Enter the bit position, which you want to set ");
        scanf("%d",&pset);
        n = n|(1<<pset);
        printf("The number after set is %d\n",n);
        printf("Enter the bit position, which bit you want to clear ");
        scanf("%d",&cbit);
        n = n&~(1<<cbit);
        printf("The number after clear is %d",n);
        return 0;
}
```

Output Screenshot:

```
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>gcc Program3.c

D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a
Enter the number which you want to check 30
Enter the bit position, to check whether bit position is set or not(starts from 0) 4
Bit position is set
Enter the bit position, which you want to set 3
The number after set is 30
Enter the bit position, which bit you want to clear 2
The number after clear is 26
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>
```

4	**a)Write a program to generate a multiplication table using for loop** **b)Write a program to print the following pattern** * * * * * * * * * * * * * * *
	Program: **#include<stdio.h>** **int main()** **{** **int n,i,j,x;** **printf("Program for Multiplication Table\n");** **printf("Which number multiplication table you want to generate: \n");** **scanf("%d",&n);** **printf("How many number of multiples \n");** **scanf("%d",&i);** **for(j=1;j<=i;j++)** **{** **x = n*j;** **printf("%d*%d= %d \n",n,j,x);** **}** **int k,lines,nstars;** **printf("How many lines do you want the pattern to be printed? ");** **scanf("%d",&lines);** **for(k=1;k<=lines;k++)** **{** **for(nstars=1;nstars<=k;nstars++)** **{** **printf("* ");** **}** **printf("\n");** **}** **return 0;** **}**

	Output Screenshot:
	`D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>gcc Program4.c`
	
	`D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a`
	`Program for Multiplication Table`
	`Which number multiplication table you want to generate:`
	`3`
	`How many number of multiples`
	`4`
	`3*1= 3`
	`3*2= 6`
	`3*3= 9`
	`3*4= 12`
	`How many lines do you want the pattern to be printed? 4`
	`*`
	`* *`
	`* * *`
	`* * * *`

5	**Write a program to implement a Simple Calculator using switch Statement** **Sample input:** Enter an operator (+, -, *,): + Enter two operands: 3 4 **Sample Output:** 3.0 + 4.0 = 7.0 **Sample input:** Enter an operator (+, -, *,): - Enter two operands: 7 6 **Sample Output:** 7.0 - 6.0 = 1.0

Program:

```
#include<stdio.h>
#include<conio.h>
int main()
{
        float a,b,c;
        char choice;
        printf("Enter the operation you want to perform (+,-,*,/) ");
        scanf("%c",&choice);
        printf("Enter the operands ");
        scanf("%f%f",&a,&b);
        switch(choice)
        {
                case '+': c = a + b;
                                printf("The sum of the two operands is = %f",c);
                                break;
                case '-': c = a - b;
                                printf("The difference of the two operands is = %f",c);
                                break;
                case '*': c = a * b;
                                printf("The product of the two operands is = %f",c);
                                break;
                case '/': c = a / b;
                                printf("The quotient of the two operands is = %f",c);
                                break;
                default: printf("Invalid choice");
        }
}
```

Output Screenshot:

```
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>gcc Program5.c

D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a
Enter the operation you want to perform (+,-,*,/) +
Enter the operands 3 4
The sum of the two operands is = 7.000000
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a
Enter the operation you want to perform (+,-,*,/) -
Enter the operands 6 4
The difference of the two operands is = 2.000000
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a
Enter the operation you want to perform (+,-,*,/) *
Enter the operands 5 4
The product of the two operands is = 20.000000
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a
Enter the operation you want to perform (+,-,*,/) /
Enter the operands 8 2
The quotient of the two operands is = 4.000000
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>
```

6 **Write a program to validate a given date and find the next date**

Sample input:

Enter the date 12

Enter the month 12

Enter the year 2000

Sample Output:

Date is valid & next date is: 13/12/2000

Sample input:

Enter the date 1

Enter the month 13

Enter the year 2000

Sample Output:

Month is invalid

Program:

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
int main()
{
        int date,month,year,leap=0;
        printf("Enter the date ");
        scanf("%d",&date);
        printf("Enter the month ");
        scanf("%d",&month);
        printf("Enter the year ");
        scanf("%d",&year);
        printf("The date is %d/%d/%d",date,month,year);
        if(date>31 && date<1)
        {
                printf("Invalid date");
                return 0;
        }
        if(month>12 || month <1)
        {
                printf("Invalid month");
                return 0;
        }
        if(year%4==0 && year%100!=0 || year%400==0)
                leap=1;
        if(leap && month == 2 && date == 28)
                date = 29;
        else
        {
                if(date==31 && (month==1 || month==3 || month==5 || month==7 ||
month==10))
                {
                        month = month+1;
                        date=1;
                }
                else if(date==31 && month==12)
                {
                        month = 1;
                        date = 1 ;
                        year++;
```

```
                }
                else if(date==30 && (month==4 || month==6 || month==8 || month==9 ||
month==11))
                {
                        month++;
                        date=1;
                }
                else if(date==28 && month==2)
                {
                        date=1;
                        month++;
                }
                else
                {
                        date++;
                }
        }
        printf("\nThe next date is %d/%d/%d",date,month,year);

        return 0;
}
```

Output Screenshot:

```
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>gcc Program6.c

D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a
Enter the date 20
Enter the month 3
Enter the year 2020
The date is 20/3/2020
The next date is 21/3/2020
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a
Enter the date 28
Enter the month 2
Enter the year 2020
The date is 28/2/2020
The next date is 29/2/2020
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a
Enter the date 28
Enter the month 2
Enter the year 2021
The date is 28/2/2021
The next date is 1/3/2021
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>
```

Practice Programs

1

Write a program to find the roots of a quadratic equation.

Sample Input:

Enter coefficients a, b and c: 1 2 1

Sample Output:

root1 = root2 = -1.00;

Sample Input:

Enter coefficients a, b and c: 1 3 1

Sample Output:

root1 = -0.38 and root2 = -2.62

Sample Input:

Enter coefficients a, b and c: 2 2 1

Sample Output:

	root1 = -0.50+0.50i and root2 = -0.50-0.50i
	Program: **#include<stdio.h>** **#include<conio.h>** **#include<math.h>** **int main()** **{** **float a,b,c,discriminant,root1,root2,img;** **printf("Enter the coefficients a,b and c: ");** **scanf("%f%f%f",&a,&b,&c);** **discriminant = (b*b)-(4*a*c);** **if(discriminant>0)** **{** **root1=(-b+sqrt(discriminant))/(2*a);** **root2=(-b-sqrt(discriminant))/(2*a);** **printf("The roots are real and distinct, %f and %f",root1,root2);** **}** **else if(discriminant==0)** **{** **root1=root2=(-b)/(2*a);** **printf("The roots are real and equal, %f and %f",root1,root2);** **}** **else** **{** **img = sqrt(-discriminant)/(2*a);** **root1 = root2 = (-b)/(2*a);** **printf("The root1 is %.2f+%f.2i",root1,img);** **printf("The root2 is %.2f-%.2fi",root2,img);** **}** **return 0;** **}**
	Output Screenshot:

```
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>gcc Practice_program1.c

D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a
Enter the coefficients a,b and c: 2 2 1
The root1 is -0.50+0.500000.2iThe root2 is -0.50-0.50i
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a
Enter the coefficients a,b and c: 1 2 3
The root1 is -1.00+1.414214.2iThe root2 is -1.00-1.41i
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a
Enter the coefficients a,b and c: 1 2 1
The roots are real and equal, -1.000000 and -1.000000
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a
Enter the coefficients a,b and c: 1 3 1
The roots are real and distinct, -0.381966 and -2.618034
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>
```

2 **Write a program to squeeze repeated characters by inputting the characters in the given order.**

Sample Input:

aaaaabbbbbccccddddeeee

Sample Output:

abcde

Sample Input:

aaa1111gggg3333

Sample Output:

a1g3

Program:

```
#include<stdio.h>
#include<string.h>
int main()
{
        char a,str1[50],str2[50];
        int j=0,i=0;
        printf("Enter repeated characters ");
        gets(str1);
        str2[j]=str1[i];
```

```
        j = 1;
        a = str1[i];
        for(i=1;i<strlen(str1);i++)
        {
                if(a!=str1[i])
                {
                        str2[j]=str1[i];
                        j++;
                        a=str1[i];
                }
        }
        str2[j]='\0';
        printf("%s",str2);
        return 0;
}
```

Output Screenshot:

```
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>gcc Practice_program2.c

D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a
Enter repeated characters aaaaaaaabbbbbbbbcccccccc
abc
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>a
Enter repeated characters aaaaaaa11111111ddddddddooo
a1do
D:\PES\Semester 2\Computer_Science- C Programming\C_Lab\Week_2>
```