Week 2: Programs on Input, Output Functions And Control Structures

Name: Renita Kurian	SRN: PES1UG20CS331	Section: N
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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)

Program:

W2 > C Marks.c > main()

```c
#include<stdio.h>

int main()
{
    int marks;
    char grade='F';
    printf("Enter your marks: ");
    scanf("%d",&marks);
    if(marks>85)
        grade='A';
    else if(marks>60)
        grade='B';
    else if(marks>40)
        grade='C';
    else if(marks>30)
        grade='D';
    else
        printf("You failed");
    if(grade!='F')
        printf("Your grade is %c",grade);
    return 0;
}
```

Output Screenshot:

```
C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab\W2>gcc Marks.c

C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab\W2>a
Enter your marks: 85
Your grade is B
C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab\W2>
```

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:
	W2 > C toUpper.c > main()
	1 #include<stdio.h>
	2
	3 int main()
	4 {
	5 char c;
	6 while((c=getchar())!='\n')
	7 {
	8 if(c>='a' && c<='z')
	9 {
	10 c=c-'a'+'A';
	11 }
	12 putchar(c);
	13 }
	14 return 0;
	15 }

	Output Screenshot: C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab\W2>gcc toUpper.c C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab\W2>a hello world HELLO WORLD C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab\W2>

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:

```
W2 > C bitwise.c > main()
  1  #include<stdio.h>
  2  int main()
  3  {
  4      unsigned int c;
  5      int i,j;
  6      printf("Enter number \n");
  7      scanf("%d",&c);
  8      printf("Enter position \n");
  9      scanf("%d",&i);
 10      if(c&(1<<i))
 11          printf("bit is set \n");
 12      else
 13          printf("Bit is not set \n");
 14      printf("Enter bit position to set \n");
 15      scanf("%d",&j);
 16      c=c|(1<<i);
 17      printf("Number after setting is: %d \n",c);
 18      printf("Enter bit position to clear \n");
 19      scanf("%d",&j);
 20      c=c & ~ (1<<i);
 21      printf("Number after clearing is: %d",c);
 22  }
```

Output Screenshot:

```
C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab\W2>gcc bitwise.c

C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab\W2>a
Enter number
4
Enter position
1
Bit is not set
Enter bit position to set
1
Number after setting is: 6
Enter bit position to clear
1
Number after clearing is: 4
```

4	**a) Write a program to generate a multiplication table using for loop** **b) Write a program to print the following pattern** * * * * * * * * * * * * * * *
	Program: **a)**

```c
#include<stdio.h>

int main()
{
    int n;
    printf("Enter a number: ");
    scanf("%d",&n);
    for(int i=1;i<=10;i++)
    {
        printf("%d x %d = %d \n",n,i,i*n);
    }
    return 0;
}
```

b)

W2 > C Pattern.c > main()

```c
#include<stdio.h>

int main()
{
    int n;
    printf("Enter a number: ");
    scanf("%d",&n);
    for(int i=0;i<n;i++)
    {
        for(int j=0;j<=i;j++)
        {
            printf("*");
        }
        printf("\n");
    }
    return 0;
}
```

Output Screenshot:

a)

```
C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab\W2>gcc Multiplication.c

C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab\W2>a
Enter a number: 5
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
```

b)

```
C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab\W2>gcc Pattern.c

C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab\W2>a
Enter a number: 3
*
**
***
```

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:
	W2 > C Calculator.c > main()
	1 #include<stdio.h>
	2
	3 int main()
	4 {
	5 int n1,n2;
	6 char op;
	7 printf("Enter an operator(=,-,*,/): \n");
	8 scanf("%c",op);
	9 printf("Enter operands \n");
	10 scanf("%d %d",&n1,&n2);
	11 switch(op)
	12 {
	13 case '+': printf("%d + %d = %d",n1,n2,n1+n2);
	14 break;
	15 case '-': printf("%d - %d = %d",n1,n2,n1-n2);
	16 break;
	17 case '*': printf("%d * %d = %d",n1,n2,n1*n2);
	18 break;
	19 case '/': printf("%d / %d = %d",n1,n2,n1/n2);
	20 break;
	21 default: printf("Invalid operator");
	22 }
	23 return 0;
	24 }

	Output Screenshot:
	`C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab\W2>gcc Calculator.c`
	
	`C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab\W2>a`
	`Enter an operator(=,-,*,/):`
	`-`
	`Enter operands`
	`12 23`
	`12 - 23 = -11`

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

Program:

```c
#include<stdio.h>
int main()
{
    int d,m,y,max;
    y=45;
    printf("Enter date, month and year \n");
    scanf(" %d %d %d",&d,&m,&y);
    if(m==1 || m==3 || m==5 ||m==7 ||m==8 ||m==10 ||m==12)
        max=31;
    else if(m==4 || m==6 || m==9 ||m==11)
        max=30;
    else if( (y%4==0) && (y%100!=0) || (y%400==0))
        max=29;
    else
        max=28;
    if(m>12 || m<1)
    printf("Invalid month \n");
    else if(d<1 || d>max)
    printf("Invalid date \n");
    else if(d==max && m!=12)
    {
        d=1;
        m+=1;
        printf("Date is valid and next date is: %d/%d/%d",d,m,y);
    }
    else if(d==31 && m==12)
    {
        d=1;
        m=1;
        y+=1;
        printf("Date is valid and next date is: %d/%d/%d",d,m,y);
    }
    else
    {
        d+=1;
        printf("Date is valid and next date is: %d/%d/%d",d,m,y);
    }
    return 0;
}
```

Output Screenshot:

```
C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab\W2>gcc D1.c

C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab\W2>a
Enter date, month and year
12 6 2002
Date is valid and next date is: 13/6/2002
```