

### **Practice Problems:**

#### **C programs to demonstrate bitwise operators:**

1. 

```
#include <stdio.h>
void main()
{
    int i = 3, num=48;
    printf("Right shift by %d: %d\n",i,num>>i);
    printf("\n");
    printf("Left shift by %d: %d\n",i,num<<i);
}
```
2. (same as above, except now we are using hexadecimal values)  

```
#include <stdio.h>
void main()
{
    int i = 0x3, num=0x30;
    printf("Right shift by %x: %x\n",i,num>>i);
    printf("\n");
    printf("Left shift by %x: %x\n",i,num<<i);
}
```
3. 

```
#include <stdio.h>
void main()
{
    int a=12,b=39;
    printf("AND=%d",a&b);
    printf("\nOR=%d",a|b);
    printf("\nXOR=%d",a^b);
}
```
4. 

```
#include<stdio.h>
void main()
{
    char c = 105;
    printf("%X", ~c); //1's complement of c
    printf("\n%X", -c); //2's complement of c
}
```

#### **5. C Program to demonstrate the usage of assignment and increment operators:**

```
#include<stdio.h>
void main()
{
    char a;
    printf("enter a lowercase letter:");
    scanf("%c",&a);
    a-=32;//not recommended, since it replaces the original
character
    printf("Uppercase of given letter is: %c",a);
    ++a;//not recommended, ...
```

```
printf("\nUppercase of next letter is: %c",a);  
}
```

#### 6. C Program to find surface area of a sphere:

```
#include <stdio.h>  
  
#define PI 3.14  
  
int main()  
{  
    float radius, sa;  
    printf("\n Please Enter the radius of a Sphere \n");  
    scanf("%f", &radius);  
  
    sa = 4 * PI * radius * radius;  
  
    printf("\n The Surface area of a Sphere = %.2f", sa);  
}
```

#### Exercise Problems:

1. Read an integer number n from user. Compute the bitwise AND of n and 1. Do you see a pattern in the result? (Hint: observe the difference in the result when n is odd vs. when n is even)
2. Read two integer numbers m, n from user. Compute the value of  $m*2^n$  as well as the value of  $m << n$ . Do you see a pattern in the result? Now compute the value of  $m/2^n$  as well as the value of  $m >> n$ . Do you see a pattern?
3. Compute the volume of a sphere; read the radius from user.
4. Read the co-ordinates of two points (x1,y1) and (x2,y2) from user. Compute the midpoints of these two points and print it up to 2 decimal points.
5. Find the angle of a segment in a circle; read the arc length and radius from user.

#### Homework Questions:

1. Compute the area of a (a) trapezoid and (b) parallelogram. Read necessary inputs from user.
2. Compute the volume and surface area of a cone. Read the radius and height of the cone from user.
3. Read the lengths of base and height of a right angle triangle. Then compute the length of its hypotenuse using Pythagorean theorem.
4. Write a C program to count total number of notes in given amount.

Tentative Input/Output (bold ones are user inputs):

Enter amount: **1176**

Total number of notes:

500: 2

100: 1

50: 1

20: 1

10: 0

5: 1

2: 0

1: 1