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