**Lab Manual 3 CSE 115 (ARA2)**

**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);

}

1. (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);

}

1. #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);

}

1. #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

}

1. **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);  } |

1. **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\*2n as well as the value of m <<n. Do you see a pattern in the result? Now compute the value of m/2n 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