DSA(number system)

Assignment Questions

Assignment Questions

1. **given a number, print its binary representation.**

   Input 1: number = 5
   Output 1: 101
   Input 2: number = 10
   Output 2: 1010

   Ans :-

```java
import java.util.*;
public class Assignment2_Q_one{
    public static void main(String[]args){
        Scanner sc = new Scanner (System.in);
        System.out.println("Enter the number which binary equivalent you
want");
        int n = sc.nextInt();

        String binaryEquivalent = Integer.toBinaryString(n);

        System.out.println("The binary equivalent of " + n + " will be
equal to " + binaryEquivalent);

    }
}
```

   Output :-

   Enter the number which binary equivalent you want
   10
   The binary equivalent of 10 will be equal to 1010

2. **given a number 'n', predict whether it is a power of two or not.**

Input 1: n = 15
Output 1: False
Input 2: n = 32
Output 2: True

Ans :-

```java
import java.util.*;
public class Assignment2_Q_two {
    public static void main(String[]args){
        Scanner sc = new Scanner (System.in);
        System.out.println("Enter the number ");
        int n = sc.nextInt();

        String binaryValue =  Integer.toBinaryString(n);

        char ar [] = binaryValue.toCharArray();


        int k = 0;
        for(int i = 0 ; i<ar.length ; i++){
            if(ar[i] == '1'){
                k++;
            }
        }

        if(k > 1){
            System.out.println("False");
        }
        else{
            System.out.println("True");
        }
    }
}
```

Output :-

Enter the number
32
True

3. **Problem 1: Given a number. Using bit manipulation, check whether it is odd or even.**

Input 8, Even

3, False

Ans :-

```
import java.util.*;
public class Assignment2_Q_three {
    public static void main(String[]args){
        Scanner sc = new Scanner (System.in);
        System.out.println("Enter the number you want to check even or
odd");
        int n = sc.nextInt();

        int a = n & 1;

        if(a == 0){
            System.out.println("This is the Even number");
        }
        else {
            System.out.println("This is the odd number");
        }
    }
}
```

Output :-

Enter the number you want to check even or odd
254
This is the Even number

4. **Given a number, count the number of set bits in that number without using an extra space. Note: bit '1' is also known as set bit.**

Ans :-

```
import java.util.*;
public class Assignment2_Q_Four {
    public static void main(String[]args){
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter a number");
        int n = sc.nextInt();

        int count = 0;

        while(n>0){
            count += n & 1;
```

```
            n >>= 1;
        }

        System.out.println("The number of the set bits are " + count);
    }
}
```

Output :-

Enter a number
7
The number of the set bits are 3

5. **Given an integer array, duplicates are present in it in a way that all duplicates appear an even number of times except one which appears an odd number of times. Find that odd appearing element in linear time and without using any extra memory.**
   For example,

   Input: arr[] = [4, 3, 6, 2, 6, 4, 2, 3, 4, 3, 3]
   Output: The odd occurring element is 4.

   Ans :-

```
import java.util.*;
public class Assignment2_Q_five {

    public static int duplicate(int ar []){

        int xorOp = 0;

        for(int t : ar){
            xorOp ^= t;
        }

        return xorOp;
    }

    public static void main(String[]args){
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the number of elements present in this
array");
        int n = sc.nextInt();
```

```
        int ar [] = new int [n];

        System.out.println("Enter the numbers present in this array");
        for(int i=0 ; i<ar.length ; i++){
            ar[i] = sc.nextInt();
        }

        int duplicateElement = duplicate(ar);

        System.out.println("The odd occurring element is " +
duplicateElement);

    }
}
```

Output :-

Enter the number of elements present in this array
11
Enter the numbers present in this array
4 3 6 2 6 4 2 3 4 3 3
The odd occurring element is 4