Lab Report
Advanced Programming (CSE 342)
Intake: 52

1. Write a Java program to add two binary numbers.
Input: a = 1110
b = 1101
Output: 11011

2. Write a Java program to find the k smallest elements in a given array. Elements in the array can be in any order.

Expected Output:
Original Array:
[1, 4, 17, 7, 25, 3, 100]
3 largest elements of the said array are:
100 25 17

3. Write a Java program that will accept an integer and convert it into a binary representation. Now count the number of bits equal to zero in this representation.

Expected Output:
Input first number: 25
Binary representation of 25 is: 11001
Number of zero bits: 2

4. Write a Java program to move every zero to the right side of a given array of integers.

Original array: [0, 3, 4, 0, 1, 2, 5, 0]
Result: [3, 4, 1, 2, 5, 0, 0, 0]

5. Write a Java program to find the median of the numbers inside the window (size k) at each step in a given array of integers with duplicate numbers. Move the window to the array start.

Sample Output:
{|1, 2, 3|, 4, 5, 6, 7, 8, 8} -> Return median 2
{1, |2, 3, 4|, 5, 6, 7, 8, 8} -> Return median 3
{1, 2, |3, 4, 5|, 6, 7, 8, 8} -> Return median 4
{1, 2, 3, |4, 5, 6|, 7, 8, 8} -> Return median 5
{1, 2, 3, 4, |5, 6, 7|, 8, 8} -> Return median 6
{1, 2, 3, 4, 5, |6, 7, 8|, 8} -> Return median 7
{1, 2, 3, 4, 5, 6, |7, 8, 8|} -> Return median 8
Result array {2, 3, 4, 5, 6, 7, 8}

6. Write a Java program to compute the digit number of the sum of two given integers.

Input:

Each test case consists of two non-negative integers a and b which are separated by a space in a line. $0 \leq a, b \leq 1{,}000{,}000$

Expected Output:

Input two integers(a b): 13 25
Digit number of sum of said two integers: 2

7. Write a Java program which solve the equation:
ax+by=c
dx+ey=f
Print the values of x, y where a, b, c, d, e and f are given.

Input:

a,b,c,d,e,f separated by a single space.
(-1,000 ≤ a,b,c,d,e,f ≤ 1,000)

Input the value of a, b, c, d, e, f: 5 6 8 9 7 4
Expected Output: -1.684 2.737

8. Write a Java program to test whether two lines PQ and RS are parallel. The four points are P(x1, y1), Q(x2, y2), R(x3, y3), and S(x4, y4).

Input:

−100 ≤ x1, y1, x2, y2, x3, y3, x4, y4 ≤ 100
Each value is a real number with at most 5 digits after the decimal point.

Expected Output:

Input P(x1,y1),separated by a space.
5 6
Input Q(x2,y2),separated by a space.
4 2
Input R(x3,y3),separated by a space.
5 3
Input S(x4,y4),separated by a space.
5 6

Two lines are not parallel.