1)

```
import java.util.Arrays;
import java.util.Scanner;

public class Assignment {

	static void rotateArray(int[] arr, int k, int n)	{
		while(k-- > 0)	{
			int shifted = arr[n-1];
			for(int i=n-2; i>=0; i--) {
				arr[i+1] = arr[i];
			}
			arr[0] = shifted;
		}

		System.out.println(Arrays.toString(arr));
	}

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

		for(int i=0; i<n; i++)	{
			arr[i] = sc.nextInt();
		}

		System.out.println("Enter the number of rotations: ");
		int k = sc.nextInt();

		rotateArray(arr, k, n);

	}

}
```

2)

```
import java.util.Arrays;
import java.util.Scanner;
```

```
public class Assignment {

	static void transposeMatrix(int[][] matrix)	{
		int n = matrix.length;

		for(int i=0; i<n; i++)	{
			for(int j=0; j<=i; j++)	{
				int temp = matrix[i][j];
				matrix[i][j] = matrix[j][i];
				matrix[j][i] = temp;
			}
		}

		for(int[] i: matrix)	{
			System.out.println(Arrays.toString(i));
		}
	}

	public static void main(String[] args) {
		Scanner sc = new Scanner(System.in);
		System.out.println("Enter the dimension of the matrix: ");
		int n = sc.nextInt();
		int[][] matrix = new int[n][n];

		for(int i=0; i<n; i++)	{
			for(int j=0; j<n; j++)	{
				matrix[i][j] = sc.nextInt();
			}
		}
		transposeMatrix(matrix);
	}

}
```

3)

```
import java.util.Scanner;

public class Assignment {

	static void spiralMatrix(int[][] matrix, int n)	{
		int top = 0, left = 0, right = n-1, bottom = n-1;

		while(top <= bottom && left <= right)	{
```

```
        for(int i=left; i<=right; i++)  {
            System.out.println(matrix[top][i]);
        }
        top++;

        for(int i=top; i<=bottom; i++)    {
            System.out.println(matrix[i][right]);
        }
        right--;

        for(int i=right; i>=left; i--)  {
            System.out.println(matrix[bottom][i]);
        }
        bottom--;
        for(int i=bottom; i>=top; i--)    {
            System.out.println(matrix[i][left]);
        }
        left++;
    }

        }

        public static void main(String[] args) {
                Scanner sc = new Scanner(System.in);
                System.out.println("Enter the dimension of the matrix: ");
                int n = sc.nextInt();
                int[][] matrix = new int[n][n];

                for(int i=0; i<n; i++)     {
                        for(int j=0; j<n; j++)     {
                                matrix[i][j] = sc.nextInt();
                        }
                }

                spiralMatrix(matrix, n);
        }

}
```

4)

```
import java.util.ArrayList;
```

```
import java.util.Scanner;

public class Assignment {

    ArrayList<ArrayList<Integer>> weights;

    Assignment(int n) {
        weights = new ArrayList<>(n);
        for (int i = 0; i < n; i++) {
            weights.add(new ArrayList<>());
        }
    }

    void addWeight(int person, int weight) {
        if (person >= 0 && person < weights.size()) {
            weights.get(person).add(weight);
        } else {
            System.out.println("Invalid person index");
        }
    }

    int getMinimumWeight(int person) {
        if (person >= 0 && person < weights.size() && !weights.get(person).isEmpty()) {
            int minWeight = Integer.MAX_VALUE;
            for (int weight : weights.get(person)) {
                if (weight < minWeight) {
                    minWeight = weight;
                }
            }
            return minWeight;
        } else {
            System.out.println("Invalid person index or no weights recorded");
            return -1;
        }
    }

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the number of persons: ");
        int n = scanner.nextInt();

        Assignment tracker = new Assignment(n);
```

```
        while (true) {
            System.out.println("Choose an option:");
            System.out.println("1. Add weight");
            System.out.println("2. Get minimum weight");
            System.out.println("3. Exit");
            int option = scanner.nextInt();

            switch(option) {
                    case 1:
                            System.out.print("Enter person index (0 to " + (n - 1) + "): ");
                        int person = scanner.nextInt();
                        System.out.print("Enter weight: ");
                        int weight = scanner.nextInt();
                        tracker.addWeight(person, weight);
                        break;
                    case 2:
                        System.out.print("Enter person index (0 to " + (n - 1) + "): ");
                        person = scanner.nextInt();
                        int minWeight = tracker.getMinimumWeight(person);
                        if (minWeight != -1) System.out.println("Minimum weight of person " + person +
": " + minWeight);
                        break;
                    case 3:
                            return;
                    default:
                            System.out.println("Invalid option");
            }
        }

    }
}
```

5)

You've completed Bird Watcher!

Awesome work. You're one step closer to learning Java 🚀

You've learnt **3 concepts** by completing this exercise.

- Ar — Arrays ✓
- Fo — For-Each Loops ✓
- Fo — For Loops ✓