**ADVANCED**

Q1. Print all the permutations of a string.

```java
public class Recursion3 {

    public static void printPermutation(String str, int idx, String perm) {
        if(str.length() == 0) {
            System.out.println(perm);
            return;
        }

        for(int i=0; i<str.length(); i++) {
            char currChar = str.charAt(i);
            String newStr = str.substring(0, i) + str.substring(i+1);
            printPermutation(newStr, idx+1, perm+currChar);
        }
    }
    public static void main(String args[]) {
        String str = "abc";
        printPermutation(str, 0, "");
    }
}
```

Time complexity - O(n*n!)

Q2. CountPathMaze

```java
public class Recursion3 {

    public static int countPaths(int i, int j, int m, int n) {
        if(i == m-1 || j == n-1) {
            return 1;
        }

        return countPaths(i+1, j, m, n) + countPaths(i, j+1, m, n);
    }

    public static void main(String args[]) {
        int m = 4, n = 5;
        System.out.println(countPaths(0, 0, m, n));
    }
}
```

Time complexity - O(2^(m+n))

## Q3. Tiling problem

```java
public class Recursion3 {

    public static int placeTiles(int n, int m) {
        if(n < m) {
            return 1;
        } else if(n == m) {
            return 2;
        }

        return placeTiles(n-1, m) + placeTiles(n-m, m);
    }

    public static void main(String args[]) {
        int n = 4, m = 4;
        System.out.println(placeTiles(n, m));
    }
}
```

## Q4. Friends pairing problem

```java
public class Recursion3 {

    public static int pairFriends(int n) {
        if(n <= 1) {
            return 1;
        }

        return pairFriends(n-1) + (n-1) * pairFriends(n-2);
    }

    public static void main(String args[]) {
        int n = 3;
        System.out.println(pairFriends(n));
    }
}
```

## Q5. Subsets of a set

```java
import java.util.ArrayList;

public class Recursion3 {

    public static void printSubsets(ArrayList<Integer> subset) {
        for(int i=0; i<subset.size(); i++) {
            System.out.print(subset.get(i)+" ");
        }
        System.out.println();
    }

    public static void findSubsets(int n, ArrayList<Integer> subset) {
        if(n == 0) {
            printSubsets(subset);
            return;
        }

        findSubsets(n-1, subset);
        subset.add(n);
        findSubsets(n-1, subset);
        subset.remove(subset.size() - 1);
    }

    public static void main(String args[]) {
        int n = 3;
        findSubsets(n, new ArrayList<Integer> ());
    }
}
```