ADVANCED

Q1. Print all the permutations of a string.

```
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

```
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

```
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

```
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> ());
   }
}
```