Daily Work Practice Date: 9/9/2023

Program: Combinations

```
package com.ishwarchavan;
import java.util.ArrayList;
import java.util.List;

public class Combinations {     //class created
      public static void main(String[] args) {
            int n = 4, k =2;
            System.out.println(combine(n,k));
      }
    public static List<List<Integer>> combine(int n, int k) {  //function created
        List<List<Integer>> res = new ArrayList<>();   //declaring new list of list for
storing results

        helper(n, k, 1,  res, new ArrayList<>());   //calling the helper function
        return res;
    }
    private static void helper(int n, int k, int idex, List<List<Integer>> res,
List<Integer> temp){
        if(temp.size()==k){     //when size of the temp list equals to k it is added to
the final list 'res'
            res.add(new ArrayList<>(temp));   //after adding the temp to res just
return
            return;
        }
        for(int i = idex; i<=n;i++){      //for loop for iterating over the range [1,n]
            temp.add(i);
            helper(n, k, i+1, res, temp);
            temp.remove(temp.size()-1);     //backtracking to the previous numeber
        }
    }
}
```

Program: Generate Parenthesis

```
package com.ishwarchavan;
import java.util.ArrayList;
import java.util.List;

class GenerateParenthesis{      //class created
      public static void main(String[] args) {   //main program started
            int n = 3;
            System.out.println(generateParenthesis(n));   //calling and printing
function
      }
    public static List<String> generateParenthesis(int n) {   //function created
        List<String> list = new ArrayList<>();   //object list created
        helper(list, "", n, n);   //calling function to the helper
        return list;
    }

    public static void helper(List<String> list, String str, int left, int right) {
//helper function created
        if(left == 0 && right == 0)   //condition is checking
            list.add(str);

        if(left > 0)    //if true then execute the below statement
            helper(list, str + "(", left - 1, right);

        if(right > left)    //if true then execute the below statement
            helper(list, str + ")", left, right - 1);   //calling function
    }
}
```