**We find and solve the subproblem.**

In order to explain, we define to represent the total enjoyment of optimal solution for days that choose to do activity on the last day. According to the question, for , if we choose to do activity 1 in day , we must do one of the rest two activities, let us say activity 2 and 3, in day . The total enjoyment of optimal solution for days that choose to do activity 2 is , and the total enjoyment of optimal solution for days that choose to do activity 3 is . If , the optimal solution for days is . Otherwise, the optimal solution for days is . Consequently, the total enjoyment of optimal solution for days that choose to do activity 1 is . Similarly, if we choose to do activity 2 in day instead of activity 1, the total enjoyment of optimal solution is . If we choose to do activity 3 in day instead of activity 2, the total enjoyment of optimal solution is . The optimal solution for days is

. **Our subproblem is: Determining the maximum total enjoyment possible over the entire stay of days and which activity to do in day . The base case is** . **The recursion is:**

.

**The final solution is .**

Note that to calculate and is the same as calculating , since

.

Also, every time we calculate , we have to determine the activity in day . **Thus, we simply record the activity each time we choose to get the sequence of activities we should do at each day.**