Assignment-4

Dynamic Programming Practice Questions

1. Given an array ‘arr’ containing the weight of ‘N’ distinct items, and two knapsacks that can withstand ‘W1’ and ‘W2’ weights, the task is to find the sum of the largest subset of the array ‘arr’, that can be fit in the two knapsacks. It’s not allowed to break any items in two, i.e an item should be put in one of the bags as a whole.

2. Given a rod of length n inches and an array of prices that includes prices of all pieces of size smaller than n. Determine the maximum value obtainable by cutting up the rod and selling the pieces. For example, if the length of the rod is 8 and the values of different pieces are given as the following, then the maximum obtainable value is 22 (by cutting in two pieces of lengths 2 and 6)

   length | 1 2 3 4 5 6 7 8
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   price | 1 5 8 9 10 17 17 20

3. Given two strings str1 and str2, the task is to find the length of the shortest string that has both str1 and str2 as subsequences.

   Example:
   Input: str1 = "AGGTAB", str2 = "GXTXAYB"
   Output: 9
   Explanation:
   String "AGXGTXAYB" has both string
   "AGGTAB" and "GXTXAYB" as subsequences.

4. Given a string s, return the longest palindromic substring in s.

   Example:
   Input: s = "babad"
   Output: "bab"
   Explanation: "aba" is also a valid answer.