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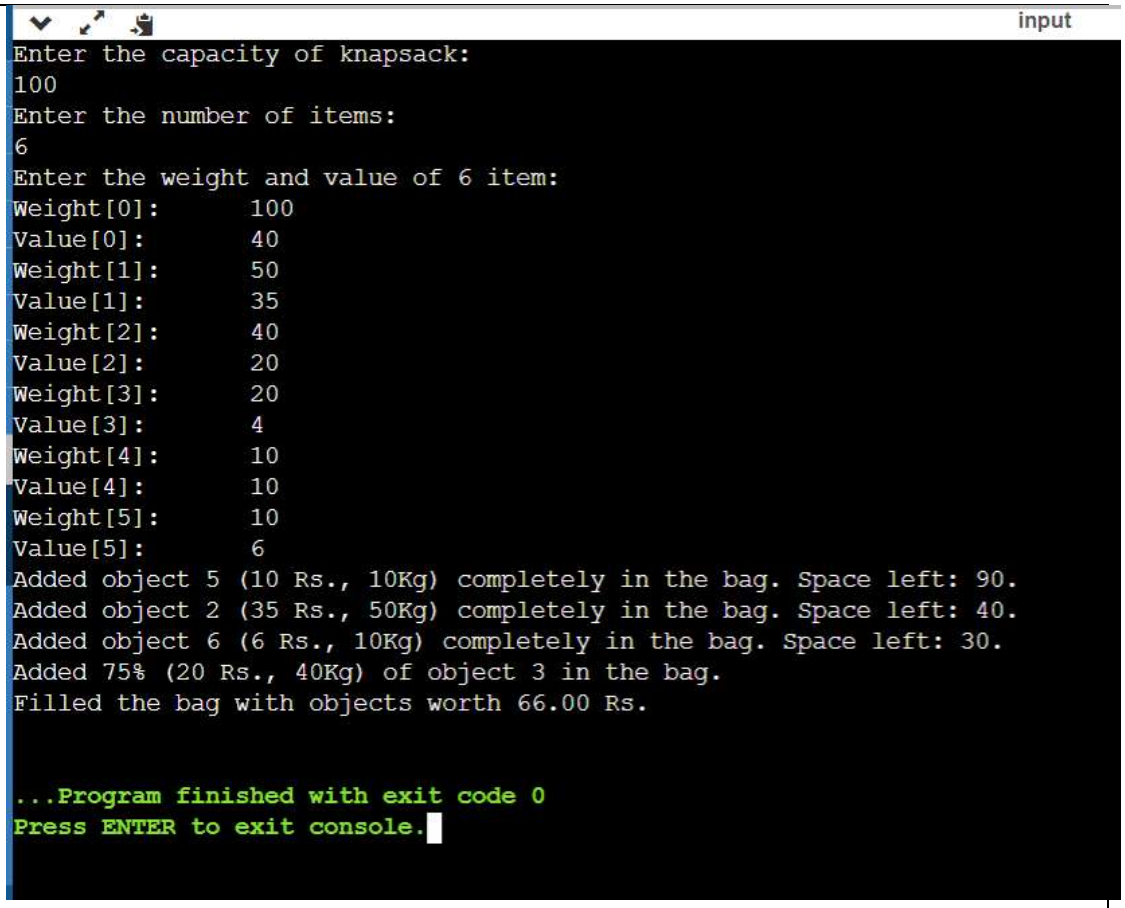
SUBJECT	Design and Analysis of Algorithm
EXPERIMENTNO :	05
DATE OF PERFORMANCE	03/04/2023
DATE OF SUBMISSION	11/04/2023
AIM:	To implement fractional knapsack problem and calculate profit.
PROBLEM STATEMENT 1:	**Fractional knapsack problem**
ALGORITH Mand THEORY:	Given the weights and profits of N items, in the form of {profit, weight} put these items in a knapsack of capacity W to get the maximum total profit in the knapsack. In Fractional Knapsack, we can break items for maximizing the total value of the knapsack.

Program:	#include<stdio.h>
	#include<stdlib.h>
	struct Item
	{
	int SrNo;
	float w,profit,ratio;
	};
	void sort(int n,struct Item a[n])
	{
	int i,j;
	struct Item temp;
	for(i=0;i<n-1;i++)
	{
	for(j=0;j<n-1;j++)
	{

```
            if(a[j].ratio>a[j+1].ratio)
            {
               temp=a[j];
               a[j]=a[j-1];
               a[j-1]=temp;
            }
         }
      }
}
void main()
{
   int n,i;
   float W,p=0;
   printf("Enter the capacity:");
   scanf("%f",&W);
   printf("Enter the number of elements:");
   scanf("%d",&n);
   struct Item a[n];
   for(i=0;i<n;i++)
   {
      printf("Enter the weight and profit:");
      scanf("%f %f",&a[i].w,&a[i].profit);
      a[i].ratio=a[i].profit/a[i].w;
      a[i].SrNo=i+1;
   }
   printf("\nINITIAL TABLE:\nSr.NO\t\tweight\t\tProfit\t\tP/w");
   for(i=0;i<n;i++)
   {

printf("\n%d\t\t%f\t%f\t%f\n",a[i].SrNo,a[1].w,a[i].profit,a[i].ratio);
   }
   sort(n,a);
   printf("\nSORTED TABLE:\nSr.NO\t\tweight\t\tProfit\t\tP/w\n");
   for(i=0;i<n;i++)
   {
      printf("%d\t\t%f\t%f\t%f\n",a[i].SrNo,a[1].w,a[i].profit,a[i].ratio);
   }

printf("_____
_____\n\n");
   printf("Knapsack
Table:\nSrNo\tElement\t\tweight\t\tProfit\t\tRatio\t\tRemaining
capacity\t\tTotal Profit\n");
```

```
    for(i=0;i<n;i++)
    {
        if(W>=a[i].w)
        {
            W-=a[i].w;
            p+=a[i].profit;
        }
        else if(W<=a[i].w)
        {
            p+=W*a[i].ratio;
            W=0;
        }

printf("\n%d\t\t%d\t\t%f\t%f\t%f\t%f\t\t%f\n",(i+1),a[i].SrNo,a[i].w,a[i]
.profit,a[i].ratio,W,p);
        if(W==0)
        {
            break;
        }
    }
    printf("\nTotal Profit: %f",p);
}
```

OUTPUT:

	
CONCLUSION:	By performing above experiment I have understood longest common subsequence. This dynamic programming approach reduces time complexity of the calculation of longest common subsequence.