ANALYSIS AND DESIGN OF ALGORITHMS

PRACTICAL 8

Aim: Write a Program to implement Fractional Knapsack

Code:

```
#include<stdio.h>
#include<conio.h>

int partition (int arr[],int carr[],int warr[], int l,int h)
{
    int i,j,temp;
    int pivot=arr[h];
    i=l-1;
    for(j=l;j<h;j++)
    {
        if(arr[j]>pivot)
        {
            i++;
            temp=arr[j];
            arr[j]=arr[i];
            arr[i]=temp;
            temp=carr[j];
            carr[j]=carr[i];
            carr[i]=temp;
            temp=warr[j];
            warr[j]=warr[i];
            warr[i]=temp;

        }
    }
temp=arr[h];
arr[h]=arr[i+1];
arr[i+1]=temp;
temp=carr[h];
carr[h]=carr[i+1];
carr[i+1]=temp;
temp=warr[h];
warr[h]=warr[i+1];
warr[i+1]=temp;
return (i+1);
}
```

```c
void quicksort(int arr[],int carr[],int warr[],int f,int l)
{
    int p;
    if(f<l)
    {
        p=partition(arr,carr,warr,f,l);
        quicksort(arr,carr,warr,f,p-1);
        quicksort(arr,carr,warr,p+1,l);
    }
}

int main()
{
    int cost[10];
    int weight[10];
    int n;
    int W;
    int sol[10];
    int i,amount;
    int p[10];
    int profit;
    profit=0;
    printf("NAME: Shaurya Guliani");
    printf("\nENROLLMENT NO.: A2305219086\n");
    printf("\nenter the number of elements");
    scanf("%d",&n);
    for(i=0;i<n;i++)
    {
        printf("Enter weight of item %d",i+1);
        scanf("%d",&weight[i]);
        printf("Enter cost of item %d",i+1);
        scanf("%d",&cost[i]);
    }
    printf("\nEnter total allowed weight");
    scanf("%d",&W);
    for(i=0;i<n;i++)
    {
        p[i]=cost[i]/weight[i];
    }
    quicksort(p,cost,weight,0,n-1);
    i=0;
    while(W>0)
    {
        if(W>=weight[i])
        {
            W=W-weight[i];
            sol[i]=1;
        }
```

```
        if(W<weight[i])
        {
            W=0;
            sol[i]=W/weight[i];
        }
        if(W==0)
        {
            sol[i]=0;
        }
        profit=profit+(sol[i]*cost[i]);

        i=i+1;
    }
    for(i=0;i<n;i++)
    {
        printf("%d ",sol[i]);
    }
    printf("Total Profit: %d",profit);
    getch();
    return 0;
}
```

Output Screen:

```
NAME: Shaurya Guliani
ENROLLMENT NO.: A2305219086

enter the number of elements3
Enter weight of item 110
Enter cost of item 160
Enter weight of item 220
Enter cost of item 2100
Enter weight of item 330
Enter cost of item 3120

Enter total allowed weight50
1 1 0 Total Profit: 160
```