**Program No.:-12**

**AIM: Write a program to implement 0-1 knapsack problem.**

**Source Code:**

#include<stdio.h>

#include<conio.h>

void knapsack(int n, float weight[], float profit[], float capacity)

{

float x[20], tp = 0;

int i, j, u;

u = capacity;

for (i = 0; i < n; i++)

x[i] = 0.0;

for (i = 0; i < n; i++)

{

if (weight[i] > u)

break;

else

{

x[i] = 1.0;

tp = tp + profit[i];

u = u - weight[i];

}

}

if (i < n)

x[i] = u / weight[i];

tp = tp + (x[i] \* profit[i]);

printf("\n\nThe result vector is:-\n ");

for (i = 0; i < n; i++)

{

printf("from bag %d\t%f\n",i+1,x[i]);

}

printf("\n\nMaximum profit is:- %f", tp);

}

void main()

{

clrscr();

float weight[20], profit[20], capacity;

int num, i, j;

float ratio[20], temp;

printf("\*\*\*\*\*\*\*\*\*\*\*\*FRACTIONAL KNAPSACK PROBLEM\*\*\*\*\*\*\*\*\*\*\*\*\n\n");

printf("\nEnter the no. of objects:- ");

scanf("%d", &num);

printf("\nEnter the wts and profits of each object:- ");

for (i = 0; i < num; i++)

{

scanf("%f %f", &weight[i], &profit[i]);

}

printf("\nEnter the capacity of knapsack:- ");

scanf("%f", &capacity);

for (i = 0; i < num; i++)

{

ratio[i] = profit[i] / weight[i];

}

for (i = 0; i < num; i++)

{

for (j = i + 1; j < num; j++)

{

if (ratio[i] < ratio[j])

{

temp = ratio[j];

ratio[j] = ratio[i];

ratio[i] = temp;

temp = weight[j];

weight[j] = weight[i];

weight[i] = temp;

temp = profit[j];

profit[j] = profit[i];

profit[i] = temp;

}

}

}

knapsack(num, weight, profit, capacity);

getch();

}

**Output:**

