**LAB 8**

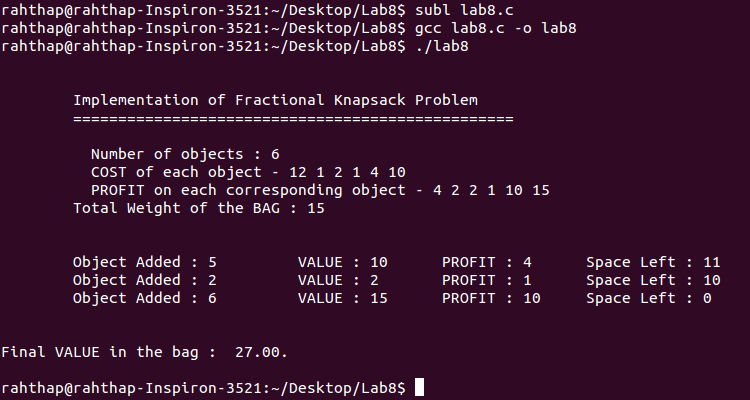
Fractional Knapsack Problem

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**SCREENSHOT :**



**CODE**:

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Problem : Implement Fractional Knapsack Problem

Algorithm

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1. Calculate DENSITY(PROFIT) : value per weight for each item

2. Sort the items as per the value density in descending order

3. Take as much item as possible not already taken in the knapsack

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#include <stdio.h>

int n;

int cost[50];

int value[50];

int W;

int q;

void knapsack\_fill() {

int current\_weight;

float total\_value;

int i, maximum\_i;

int used[10];

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

used[i] = 0;

current\_weight = W;

while (current\_weight > 0) { // While the bag is NOT full : add

// Find the suitable object to ADD

maximum\_i = -1;

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

if ((used[i] == 0) &&((maximum\_i == -1) || ((float)value[i]/cost[i] > (float)value[maximum\_i]/cost[maximum\_i])))

maximum\_i = i;

used[maximum\_i] = 1; // Maximum value used

current\_weight -= cost[maximum\_i];

total\_value += value[maximum\_i];

if (current\_weight >= 0)

printf("\tObject Added : %d\t VALUE : %d\t PROFIT : %d\t Space Left : %d\n", maximum\_i + 1, value[maximum\_i], cost[maximum\_i], current\_weight);

else {

printf("\tObject Added : %d\t VALUE : %d\t PROFIT : %d\t Space Left : %d\n", (int)((1 + (float)current\_weight/cost[maximum\_i]) \* 100), value[maximum\_i], cost[maximum\_i], maximum\_i + 1);

total\_value -= value[maximum\_i];

total\_value += (1 + (float)current\_weight/cost[maximum\_i]) \* value[maximum\_i];

}

}

printf("\n\n");

printf("Final VALUE in the bag : %.2f.\n\n", total\_value);

}

int main(){

printf("\n\n");

printf("\tImplementation of Fractional Knapsack Problem\n");

printf("\t=================================================\n\n");

printf("\t Number of objects : ");

scanf("%d",&n);

printf("\t COST of each object - ");

for(q=0;q<n;q++){

scanf("%d",&cost[q]);

}

printf("\t PROFIT on each corresponding object - ");

for(q=0;q<n;q++){

scanf("%d",&value[q]);

}

printf("\tTotal Weight of the BAG : ");

scanf("%d",&W);

printf("\n\n");

knapsack\_fill();

return 0;

}