**Lab 4:**

**Knapsack Problem:**

#include<stdio.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("Maximum profit is: %f\n", tp);

}

int main() {

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

int num, i, j;

float ratio[20], temp;

printf("\n\n Naveen Malhotra\n\n");

printf("Enter the no. of Items: ");

scanf("%d", &num);

printf("Enter the wts and profits of each object: ");

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

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

}

printf("Enter the capacityacity of knapsack: ");

scanf("%f", &capacity);

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

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

}

// sorting the ratio array in descending order using bubble sort algorithm

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);

return(0);

}

**OUTPUT:**

Text

Description automatically generated with medium confidence