Heaven's Light is Our Guide

Rajshahi University of Engineering and Technology

Department of Computer Science and Engineering

Course No: CSE.2202

Course Title: Sessional based on CSE.2201 (Computer Algorithms)

Report On: Lab Final Problem 3

Submitted To

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Problem 3:

Algorithm:

① Greedy knapsack (m, n) {

// objects are orden as $P[i]/w[i] \geq P[i+1]/w[i+1]$

// m is the size of knap sack.

// n is the numben of objects.

for i := 1 to n do x[i] = 0.0

U := m

for i = i to n do {

if (w[i] > U) then break;

x[i] = 1.0; U = U - w[i];

}

if (i ≤ n) then x[i] := U/w[i];

}

(ii)

```
0/1 knapsack ( w , n) {
for i = 0 to w do {
    for j = 0 to n do {
if (i != 0 or j = 0) then
dp [i][j] = 0;
else if ( i - w[j-1] < 0) then
    dp[ i][j] = dp[i][j-1];
else {
    dp[i][j] = max( dp[i][j-1),
        (dp[i-w[j-1]][j] + v[j-1]));
    }
}
}
```

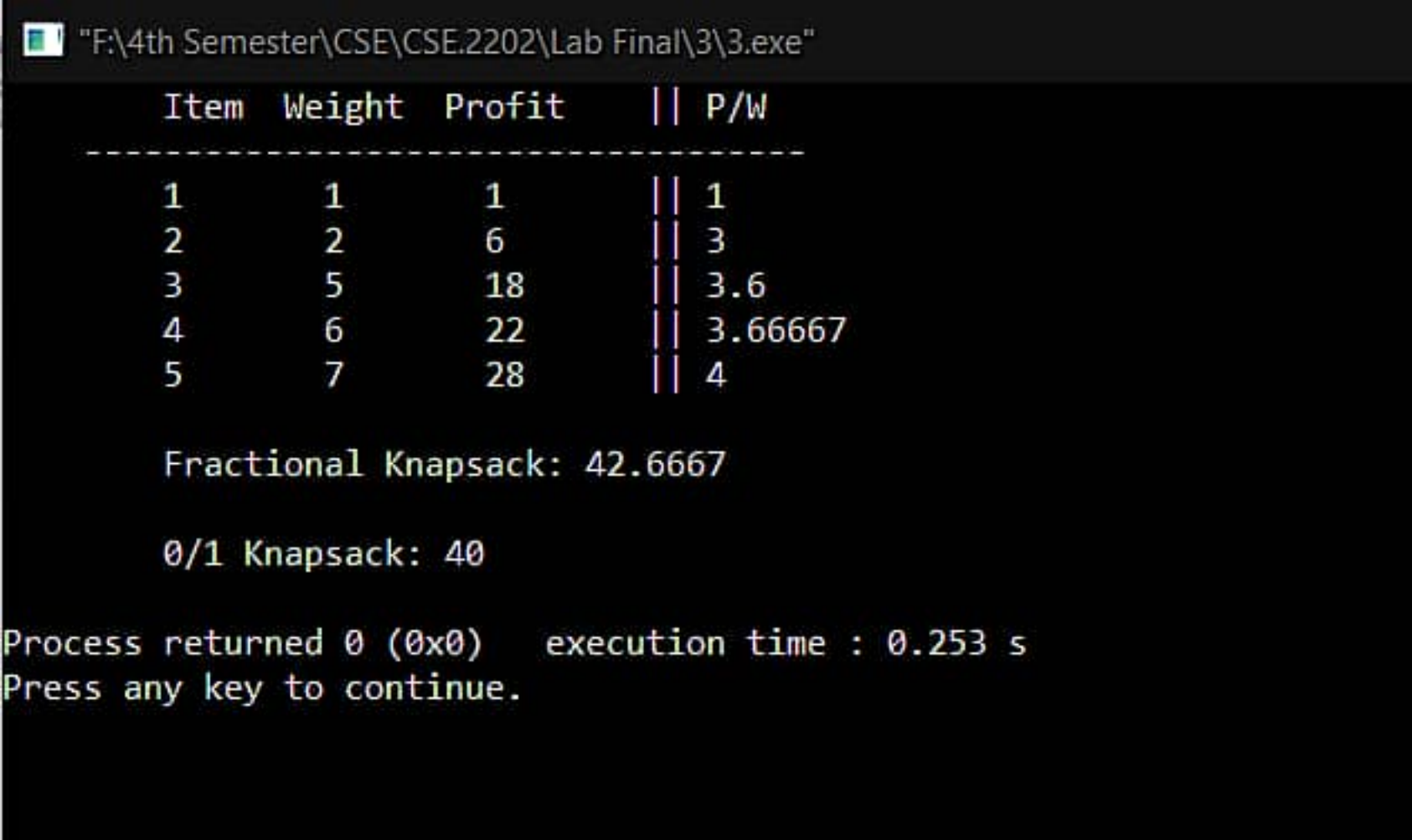
Code :

```
#include <bits/stdc++.h>
using namespace std;
int wt = 11 ; wl, n=0;
float p=0 , dp[200][200];
veton<float> nwp[5];

void inputs ( int w[], int v[]){
    for (int i=0 ; i<5 ; i++){
        nwp[0].push_back(0 i+1);
        nwp[1].push_back (w[i]);
        nwp[2].push_back (v[i]);
    }
for (int i=0; i<5; i++){
    nwp[3].push_back ( nwp[2][i] / nwp[1][i]);
}
for( int i=0; i<5; i++){
    for( int j=i+1; j<5; j++){
        if (nwp[3][i] < nwp[3][j]){
            swap( nwp[0][i], nwp[0][j];
            swap (nwp[1][i], nwp[1][j];
```

```
                swap(map[2][i], map[2][j]);
                swap(map[3][i], map[3][j]);

            }

        }

    }

void fractionalknapsack(){
        cn1 = cnt;
    while(cn1>0){
        if (cn1 > map[1][n]){
            p+= map[2][n];
            cn1 -= map[1][n];
        }
        else{
            p+= ((map[2][n]*cn1)/map[1][n]);
            cn1 = 0
        }
        n+=1;
    }
    cout<<" Greedy knapsack :" << p <<endl;
}
```

```
void 2_0_knapsack ( int wt[], int v[]){
    for ( int i=0 ; i<= cnt ; i++){
        for ( int j= 0; j<=5 ; j++){
            if ( i==0 || j==0) {
                dp[ i][j] = 0;
            }
        else if ( i - wt[ j-1] <0){
            dp[i][j] = dp[ i][ j-1];
        }
        else { dp[ i][j] = max( dp[i][ j-1], (dp[i- wt[j-1]][j]
                                + v [j-1]));
            }
        }
    }
}
cout << " 0/1 knapsack: " << dp[cnt][5] <<endl;
}
```

```
int main() {

        int w[] = { 1, 2, 5, 6, 7};
        int v[] = { 1, 6, 18, 22, 28};

        input (w, v);

        fractional_knapsack ();
        2_0_knapsack ();


return 0;

}
```


"F:\4th Semester\CSE\CSE.2202\Lab Final\3\3.exe"
Item Weight Profit || P/W
1 1 1 || 1
2 2 6 || 3
3 5 18 || 3.6
4 6 22 || 3.66667
5 7 28 || 4
Fractional Knapsack: 42.6667
0/1 Knapsack: 40
Process returned 0 (0x0) execution time : 0.253 s
Press any key to continue.