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**ROLL NO. – 1906137**

**SUBJECT NAME – DESIGN AND ANALYSIS OF ALGORITHMS LAB**

**SUBJECT CODE – CSL4403**

**DATE – 25TH JAN, 2021**

**BRANCH – CSE 2**

**ASSIGNMENT-5**

**Q5. WAP to implement fractional knapsack problem using greedy method.**

**Source Code in C Language:**

#include <stdio.h>

void swap(float\* a, float\* b)

{

float t = \*a;

\*a = \*b;

\*b = t;

}

int partition (float arr[],float p[],float w[], int low, int high)

{

float pivot = arr[high];

int i = (low - 1);

for (int j = low; j <= high- 1; j++)

{

if (arr[j] < pivot)

{

i++;

swap(&arr[i], &arr[j]);

swap(&p[i], &p[j]);

swap(&w[i], &w[j]);

}

}

swap(&arr[i + 1], &arr[high]);

swap(&p[i+1], &p[high]);

swap(&w[i+1], &w[high]);

return (i + 1);

}

void quickSort(float arr[],float p[],float w[], int low, int high)

{

if (low < high)

{

int pi = partition(arr,p,w, low, high);

quickSort(arr,p,w, low, pi - 1);

quickSort(arr,p,w, pi + 1, high);

}

}

int main()

{

int n;

float cw;

printf("Enter the capacity of knapsack.\n");

scanf("%f",&cw);

printf("Enter the number of items.\n");

scanf("%d",&n);

float p[n];

float w[n];

float r[n];

printf("Enter the profits of items.\n");

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

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

printf("Enter the weights of items.\n");

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

{

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

r[i]=(p[i]\*1.0)/w[i];

}

quickSort(r,p,w,0,n-1);

float pro=0.0;

for(int i=n-1;i>=0;i--)

{

if(cw<=0)

break;

if(w[i]<=cw)

{

pro+=p[i];

cw-=w[i];

}

else if(w[i]>cw)

{

pro+=(r[i]\*cw);

cw=0;

}

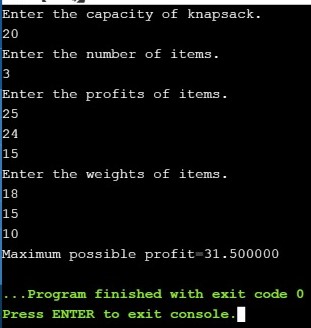
}

printf("Maximum possible profit=%f",pro);

return 0;

}

**Output Screenshot:**

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