**0/1 knapsack**

#include<stdio.h>

#include<conio.h>

int w[10], p[10], v[10][10], n, i, j, cap, x[10] = { 0 };

int max(int i, int j) {

return ((i>j) ? i : j);

}

int knap(int i, int j) {

int value;

if (v[i][j]<0) {

if (j<w[i])

value = knap(i - 1, j); else

value = max(knap(i - 1, j), p[i] + knap(i - 1, j - w[i]));

v[i][j] = value;

}

return(v[i][j]);

}

int main() {

int profit, count = 0;

printf("\nEnter the number of elements\n");

scanf\_s("%d", &n);

printf("Enter the profit and weights of the elements\n");

for (i = 1;i <= n;i++) {

printf("For item no %d\n", i);

scanf\_s("%d%d", &p[i], &w[i]);

}

printf("\nEnter the capacity \n");

scanf\_s("%d", &cap);

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

for (j = 0;j <= cap;j++)

if ((i == 0) || (j == 0))

v[i][j] = 0; else

v[i][j] = -1;

profit = knap(n, cap);

i = n;

j = cap;

while (j != 0 && i != 0) {

if (v[i][j] != v[i - 1][j]) {

x[i] = 1;

j = j - w[i];

i--;

}

else

i--;

}

printf("Items included are\n");

printf("Sl.no\tweight\tprofit\n");

for (i = 1;i <= n;i++)

if (x[i])

printf("%d\t%d\t%d\n", ++count, w[i], p[i]);

printf("Total profit = %d\n", profit);

\_getch();

return 0;

}

**OUTPUT**

