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| Assignment No: 04     1. A program of “Knapsack 0-1 using Dynamic Programming”. | |
| Date of Performance: 28/07/2019  Date of Submission: 04/08/2019 | Student ID: 17-02-04-058  Group: B1 |

**No.1:**

**#include<stdio.h>**

**#include<conio.h>**

**#define MAX 100**

**int main()**

**{**

**int n,flag[MAX]= {0},v[MAX],w[MAX],m[MAX][MAX],W,i,j,k;**

**printf("Enter the number of elements: ");**

**scanf("%d",&n);**

**printf("Enter the values: ");**

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

**scanf("%d",&v[i]);**

**printf("Enter the weights: ");**

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

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

**printf("Enter the capacity of knapsack: ");**

**scanf("%d",&W);**

**for(j=0; j<=W; j++)**

**m[0][j]=0;**

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

**{**

**for(j=0; j<=W; j++)**

**{**

**if(w[i]<=j)**

**{**

**if( m[i-1][j] > (m[i-1][j-w[i]]+v[i]) )**

**m[i][j]=m[i-1][j];**

**else**

**m[i][j]=m[i-1][j-w[i]]+v[i];**

**}**

**else**

**m[i][j]=m[i-1][j];**

**}**

**}**

**i=n;**

**k=W;**

**while(i>0 && k>0)**

**{**

**if(m[i][k]!=m[i-1][k])**

**{**

**flag[i]=1;**

**k=k-w[i];**

**i=i-1;**

**}**

**else**

**i--;**

**}**

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

**for(i=0; i<=W; i++)**

**printf("%d\t",i);**

**printf("\n");**

**for(i=0; i<=10\*W; i++)**

**printf("-");**

**printf("\n");**

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

**{**

**printf("%d |\t", i);**

**for(j=0; j<=W; j++)**

**printf("%d\t",m[i][j]);**

**printf("\n");**

**}**

**printf("\nThe resultant vector is ");**

**printf("( ");**

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

**printf("%d ",flag[i]);**

**printf(")");**

**printf("\n\nThe total profit is %d",m[n][W]);**

**printf("\n");**

**printf("\nThe objects selected are ");**

**printf("\nWeight \tProfit");**

**for(i=0; i<=W; i++)**

**{**

**printf("\n");**

**if(flag[i]==1)**

**{**

**printf("%d\t",w[i]);**

**printf("%d",v[i]);**

**}**

**}**

**getch();**

**return 0;**

**}**