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ADA LAB TEST-2

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SEC: 4 'D'

3. Implement 0/1 Knapsack problem using dynamic programming.

Modification : Give the count of the items selected

```
# include <stdio.h>
int max (int a, int b)
{
    if (a > b)
    return a;
    else return b;
}
Void Knapsack (int w[], int v[], int s, int n)
{
  int K[n+1][s+1];
  int i, j, res=0;
  int count =0, weight =0;

  for(i=0; i<=n; i++)
   for(j=0; j<=s; j++)
    {
        if (i==0 || j==0)
         K[i][j]=0;
```


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```
else if(w[i-1]<=j)
K[i][j] = max( v[i-1] + K[i-1][j-w[i-1]], K[i-1][j]);
else
K[i][j] = K[i-1][j];
}
res = K[n][s];
printf("\n Maximum Value that can be obtained is:
    %d", res);
j = s;
printf("\n The objects with there respective weights
    are:");
for( i=n; i>0 && res>0; i--)
{
  if (res == K[i-1][j])
   continue;
  else
  {
   printf("%d", w[i-1]);
   res = res - v[i-1];
   j = j - w[i-1];
   count++; // modification for counting the no. of objects
  weight = weight + w[i-1];
  }
}
```


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```
// modification
printf ("\n The count of the items selected is : %d", count);
printf ("\n The total weight of the items selected : %d",
                                                    weight);


int main()
{
  int w[10], v[10], s, n, i;
  printf ("\n Enter the Number of objects : ");
  scanf ("%d", &n);
  printf ("\n Enter the Weights of the objects :");
  for( i=0; i<n; i++)
    scanf ("%d", &v.
  for( i=0; i<n; i++)
  scanf ("%d", &w[i]);
  printf (" Enter the values of the object \n");
  for(i=0; i<n; i++)
  scanf ("%d", &v[i]);
  printf ("\n Enter the size of the knapsack :");
  scanf("%d", &s);
  Knapsack (w, v, s, n);
}
```


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