DESIGN AND ANALYSIS OF ALGORITHMS – 2CS503

Practical 9

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1. Knapsack Problem

Code:

```
#include<stdio.h>
int max(int a, int b) {
  if(a>b){
    return a;
  } else {
    return b;
  }
}
int knapsack(int W, int wt[], int val[], int n) {
  int i, w;
  int knap[n+1][W+1];
  for (i = 0; i <= n; i++) {
    for (w = 0; w <= W; w++) {
```

```
      if (i==0 || w==0)
        knap[i][w] = 0;
      else if (wt[i-1] <= w)
        knap[i][w] = max(val[i-1] + knap[i-1][w-wt[i-1]], knap[i-1][w]);
      else
        knap[i][w] = knap[i-1][w];
    }
  }
  return knap[n][W];
}
int main() {
  int val[] = {20, 30, 66, 40, 60};
  int wt[] = {10, 20, 30, 40, 50};
  int W = 100;
  int n = sizeof(val)/sizeof(val[0]);
  printf("The solution is : %d", knapsack(W, wt, val, n));
  return 0;
}

/*
Output:
The solution is : 156
*/
```