Practice 3

We highly encourage being environment friendly and trying all problems on your own.

1. **Knapsack Problem. There are 5 items that have a value and weight list below, the knapsack can contain at most 100 Lbs. Solve the problem both as fractional knapsack and 0/1 knapsack.**

value(SUS)	20	30	65	40	60
weight(Lbs)	10	20	30	40	50
value/weight	2	1.5	2.1	1	1.2

2. **A simple scheduling problem. We are given jobs $j_1, j_2 \ldots j_n$, all with known running times $t_1, t_2 \ldots t_n$, respectively. We have a single processor. What is the best way to schedule these jobs in order to minimize the average completion time. Assume that it is a nonpreemptive scheduling: once a job is started, it must run to completion. The following is an instance.**
   a) ***(j_1, j_2, j_3, j_4) : (15, 8, 3, 10)***

3. **Single-source shortest paths. The following is the adjacency matrix, vertex A is the source.**

	A	B	C	D	E
A		-1	3		
B			3	2	2
C					
D		1	5		
E				-3	

4. **All-pairs shortest paths. The adjacency matrix is as same as that of problem 3.(Use Floyd or Johnson's algorithm)**