

# HW #6 Ch 6 and Ch 7

## Ch. 6 Exercises

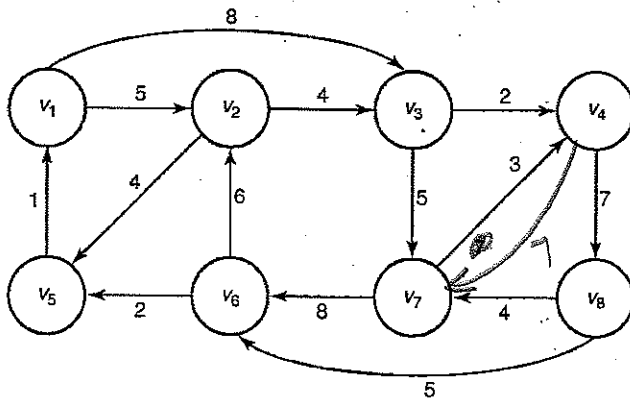
- Use Algorithm 6.2 (The Best-First Search with Branch-and-Bound Pruning algorithm for the 0-1 Knapsack problem) to maximize the profit for the problem instance of Exercise 1. Show the actions step by step.
- Implement Algorithm 6.2 on your system and run it on the problem instance of Exercise 1.

Exercise 1  
problem  
instance  $\Rightarrow$

$i$	$P_i$	$w_i$	$\frac{P_i}{w_i}$
1	\$20	2	10
2	\$30	5	6
3	\$35	7	5
4	\$12	3	4
5	\$3	1	3

$$W = 13$$

- Use Algorithm 6.3 (The Best-First Search with Branch-and-Bound Pruning Algorithm for the Traveling Salesperson problem) to find an optimal tour and the length of the optimal tour for the graph below.



Show the actions step by step.

- Implement Algorithm 6.3 on your system, and run it on the problem instance of Exercise 7. Use different bounding functions and study the results.

Ch 7  
Exercises:

### Section 7.9

- Implement the Radix Sort algorithm (Algorithm 7.6), run it on your system, and study its best-case, average-case, and worst-case performances using several problem instances.
- Show that when all the keys are distinct the best-case time complexity of Radix Sort (Algorithm 7.6) is in  $\Theta(n \lg n)$ .