CS 375 HW1
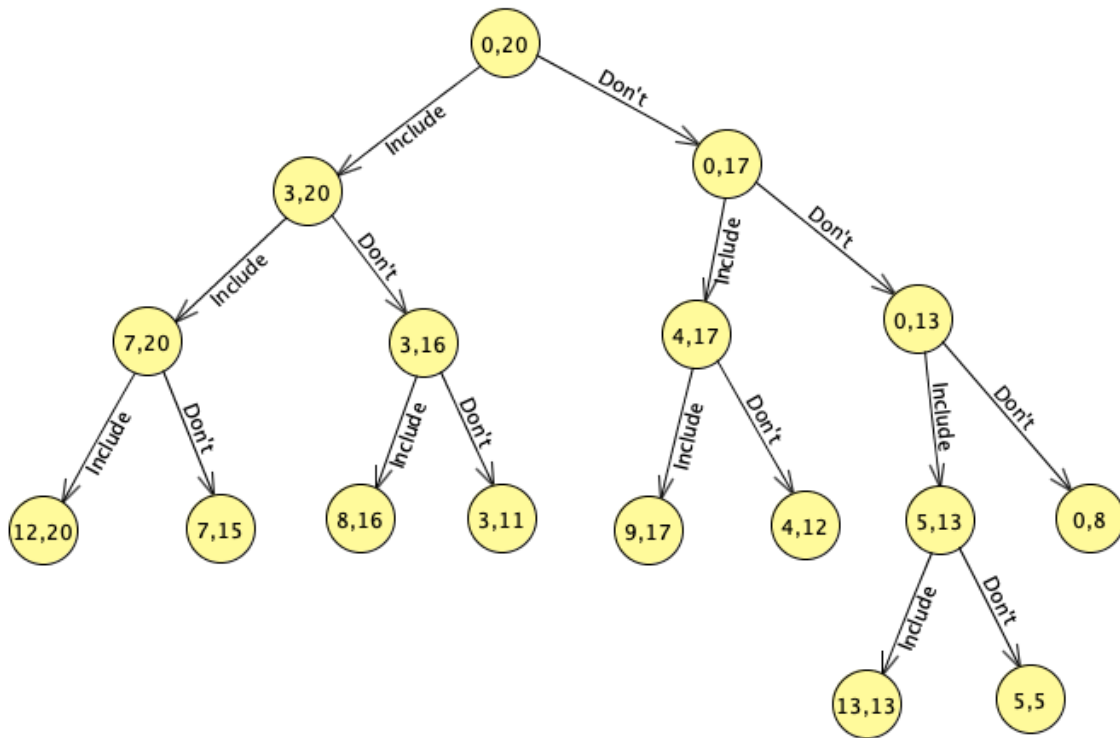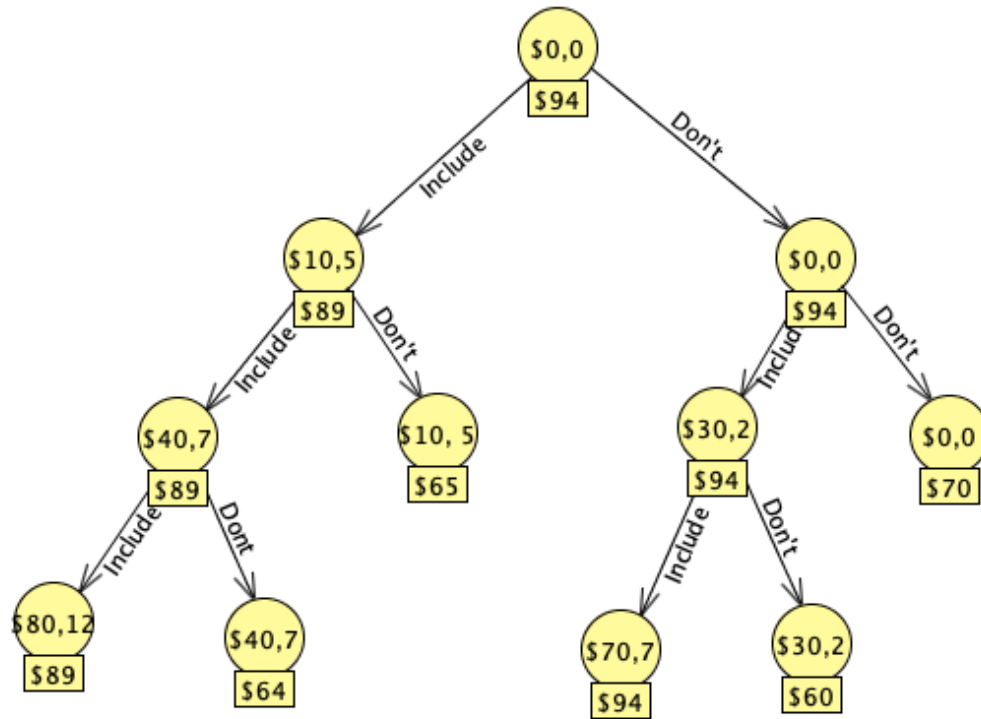
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"I have done this assignment completely on my own. I have not copied it, nor have I given my solution to anyone else. I understand that if I am involved in plagiarism or cheating I will have to sign an official form that I have cheated and that this form will be stored in my official university record. I also understand that I will receive a grade of 0 for the involved assignment for my first offense and that I will receive a grade of "F" for the course for any additional offense."

Question 1: Set: $[3, 4, 5, 8]$ find subsets that sum to 13

Optimal: {5, 8} or Item 3 and 4
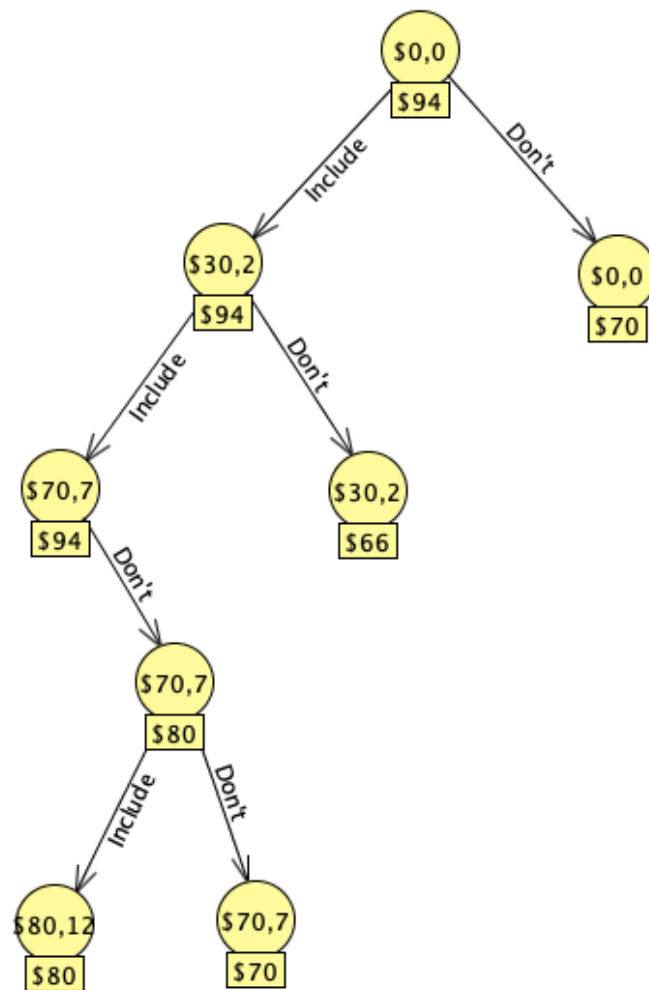
Question 2:

A decision tree diagram with nodes and branches:

- Root node: $0,0 — $94
  - **Include** branch → $10,5 — $89
    - **Include** branch → $40,7 — $89
      - **Include** branch → $80,12 — $89
      - **Dont** branch → $40,7 — $64
    - **Don't** branch → $10, 5 — $65
  - **Don't** branch → $0,0 — $94
    - **Include** branch → $30,2 — $94
      - **Include** branch → $70,7 — $94
      - **Don't** branch → $30,2 — $60
    - **Don't** branch → $0,0 — $70

Question 3:
Sorted:
Item 1: $30, 2lb, $15/lb
Item 2: $40, 5lb, $8/lb
Item 3: $30, 10lb, $3/lb
Item 4: $10, 5lb, $2/lb

Question 4:

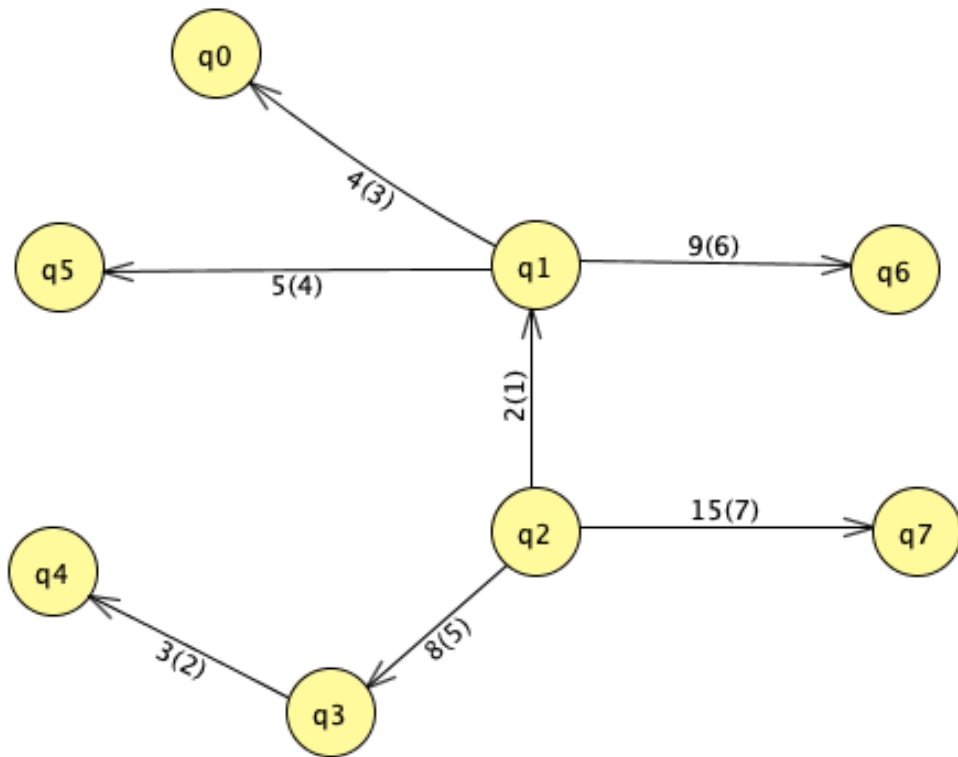| $Node Added$	$D(a)nearest$	$D(b)nearest$	$D(c)nearest$	$D(d)nearest$
$\{\}$	$\infty/NILL$	$\infty/NILL$	$\infty/NILL$	$\infty/NILL$
$\{a\}$		$8/a$	$1/a$	$\infty/NILL$
$\{a,c\}$		$3/c$		$5/c$
$\{a,c,b\}$				$2/b$

Question 5:

Note: formatted as "x(y)" where x is the weight and y is the order picked

Total Weight = 2+3+4+5+8+9+15 = 46

Question 6:

$$D(0) = \begin{vmatrix} 0 & 8 & ? & 1 \\ ? & 0 & 1 & ? \\ 4 & ? & 0 & ? \\ ? & 2 & 9 & 0 \end{vmatrix}$$

$$D(1) = \begin{vmatrix} 0 & 8 & ? & 1 \\ ? & 0 & 1 & ? \\ 4 & 12 & 0 & 5 \\ ? & 2 & 9 & 0 \end{vmatrix}$$

$$D(2) = \begin{vmatrix} 0 & 8 & 9 & 1 \\ ? & 0 & 1 & ? \\ 4 & 12 & 0 & 5 \\ ? & 2 & 3 & 0 \end{vmatrix}$$

$$D(3) = \begin{vmatrix} 0 & 8 & 9 & 1 \\ 5 & 0 & 1 & 6 \\ 4 & 12 & 0 & 5 \\ 7 & 2 & 3 & 0 \end{vmatrix}$$

$$D(4) = \begin{vmatrix} 0 & 3 & 4 & 1 \\ 5 & 0 & 1 & 6 \\ 4 & 7 & 0 & 5 \\ 7 & 2 & 3 & 0 \end{vmatrix}$$