Week 11 Recitation

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• Questions about lecture / homework so far?

• How to use Algorithm2e package for writing algorithms. See algo_example.tex for what was done in class, or visit http://www.ctan.org/tex-archive/macros/latex/contrib/algorithm2e/ to see the package documentation.

• Rosen 3.1.1) List all the steps used by Algorithm 1 to find the maximum of the list \{1, 8, 12, 9, 11, 2, 14, 5, 10, 4\}.

To show the steps used in an algorithm, you show the changes in assignments incrementally.

So in this problem, we start with line 1 of the \textsc{Max} method as defined in algo_example:

\begin{itemize}
  \item $max = 1$
\end{itemize}

Then, you incrementally show each iteration of $i$ in the for loop of line 2, and the results if $max$ changes:

\begin{itemize}
  \item $i = 2, max = 8$
  \item $i = 3, max = 12$
  \item $i = 4$
  \item $i = 5$
  \item $i = 6$
  \item $i = 7, max = 14$
  \item $i = 8$
  \item $i = 9$
  \item $i = 10$
\end{itemize}
Putting all of this together, the answer would be:

\[ \max = 1 \]

\[ i = 2, \max = 8, \]

\[ i = 3, \max = 12, \]

\[ i = 4, \]

\[ i = 5, \]

\[ i = 6, \]

\[ i = 7, \max = 14, \]

\[ i = 8, \]

\[ i = 9, \]

\[ i = 10 \]

- Rosen 3.1.53b) Use the greedy algorithm to make change using quarters, dimes, nickels, and pennies for 69 cents

\[ c_1 = 25, \; c_2 = 10, \; c_3 = 5, \; c_4 = 1. \]

\[ n = 69 \]

\[ C = \emptyset, \]

\[ i = 1, C = \{25\}, n = 44 \]

\[ i = 1, C = \{25, 25\}, n = 19 \]

\[ i = 2, C = \{25, 25, 10\}, n = 9 \]

\[ i = 3, C = \{25, 25, 10, 5\}, n = 4 \]

\[ i = 4, C = \{25, 25, 10, 5, 1\}, n = 3 \]

\[ i = 4, C = \{25, 25, 10, 5, 1, 1\}, n = 2 \]

\[ i = 4, C = \{25, 25, 10, 5, 1, 1, 1\}, n = 1 \]

\[ i = 4, C = \{25, 25, 10, 5, 1, 1, 1, 1\}, n = 0 \]

- Rosen 3.1.55b) Use the greedy algorithm to make change using quarters, dimes, and pennies for 69 cents

\[ c_1 = 25, \; c_2 = 10, \; c_3 = 1. \]

\[ n = 69 \]

\[ C = \emptyset, \]

\[ i = 1, C = \{25\}, n = 44 \]

\[ i = 1, C = \{25, 25\}, n = 19 \]

\[ i = 2, C = \{25, 25, 10\}, n = 9 \]

\[ i = 3, C = \{25, 25, 10, 1\}, n = 8 \]

\[ i = 3, C = \{25, 25, 10, 1, 1\}, n = 7 \]

\[ i = 3, C = \{25, 25, 10, 1, 1, 1\}, n = 6 \]

\[ i = 3, C = \{25, 25, 10, 1, 1, 1, 1\}, n = 5 \]

\[ i = 3, C = \{25, 25, 10, 1, 1, 1, 1, 1\}, n = 4 \]

\[ i = 3, C = \{25, 25, 10, 1, 1, 1, 1, 1, 1\}, n = 3 \]

\[ i = 3, C = \{25, 25, 10, 1, 1, 1, 1, 1, 1, 1\}, n = 2 \]
\[ i = 3, C = \{25, 25, 10, 1, 1, 1, 1, 1, 1, 1\}, n = 1 \]
\[ i = 3, C' = \{25, 25, 10, 1, 1, 1, 1, 1, 1, 1\}, n = 0 \]

- Rosen 3.1.31 – Solution in algo_example.tex file
- (Last 10 minutes) Quiz