Lab 7 Solution
Structures, Pointers, and I/O
CS 350: Computer Org. & Asm. Lang. Pgm'g

Written Problems
1. (Code to generate memory diagram) Three sample answers:
   \[
   \text{int } b[4]=\{2,4,2,8\}, \; *p = b, \; *q = p+1, \; *r = b+2; \\
   \text{int } *p, *q, *r; \; p = b; \; q = &b[1]; \; r = &b[2]; \\
   \text{int } *p, *q, *r; \; r = &b[2]; \; q = r-1; \; p = r-2;
   \]

2. (Evaluate logical expressions)
   a. \( p < q < r \) \hspace{1cm} \text{Warning (Comparing integer } p < q \text{ with pointer } r. \)
      \hspace{1cm} \text{Note difference with } p < q \&\& q < r, (which is true)
   b. \( p != r \&\& *p == *r \) \hspace{1cm} \text{Evaluates to 1}
   c. \( q-b == &b[3] - &p[1] \) \hspace{1cm} \text{Evaluates to 0}
   d. \( p[1] == r[-1] \) \hspace{1cm} \text{Evaluates to 1}
   e. \( &r[-2] == &b[0] \) \hspace{1cm} \text{Evaluates to 1}
   f. \( q-p+q-p == q+q-p-p \) \hspace{1cm} \text{Syntax error: Can’t add pointers } q+q
      \hspace{1cm} \text{“Invalid operands to binary expression”}

3. (Memory diagram for code) [updated 10/6]; corrected \( v \) from 15 to 30 [10/17]

\[
\begin{array}{cccc}
12 & 13 & 14 & 15 \\
\end{array}
\]

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\text{b} \\
\text{z} \\
\text{x} \\
\text{y} \\
\text{u} \\
\text{v}
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v. Mon 4/29