(Q1) Insert the specified keys in the following AVL trees. The resulting tree would be an unbalanced AVL tree. Identify the unbalanced node and indicate whether the unbalance is a "line" case or a "kink" case.

(Q2) Draw the AVL tree that results from inserting the keys 1, 3, 7, 5, 6, 9 in that order into an initially empty AVL tree. (*Hint*: Drawing intermediate trees as you insert each key can help.)
The following hash table uses the hash function \( h(x) = x \mod 7 \) and separate chaining to avoid collisions. The following table shows the resulting hash table after inserting keys 1, 16, 8, and 5. Now suppose we insert keys 7 and 9 in the hash table. What would the hash table look like (show where the keys would be inserted).

\[ \begin{array}{cccccc}
0 & 1 & 2 & 3 & 4 & 5 \\
\hline
& & & & & \\
1 & 16 & & & & 5 \\
8 & & & & & \\
7 & & & & &
\end{array} \]

What is the load factor of the resulting hash table in (Q3)?

\[
\lambda = \frac{\text{num of entries}}{\text{array capacity}} = \frac{n}{c} = \frac{6}{7}
\]

What is the load factor of the following hash table?

\[ \begin{array}{cccccc}
0 & 1 & 2 & 3 & 4 & 5 \\
\hline
& & & & & \\
7 & 1 & 16 & 8 & 9 & 5 \\
\end{array} \]

\[
\lambda = \frac{a}{c} = \frac{7}{6}
\]