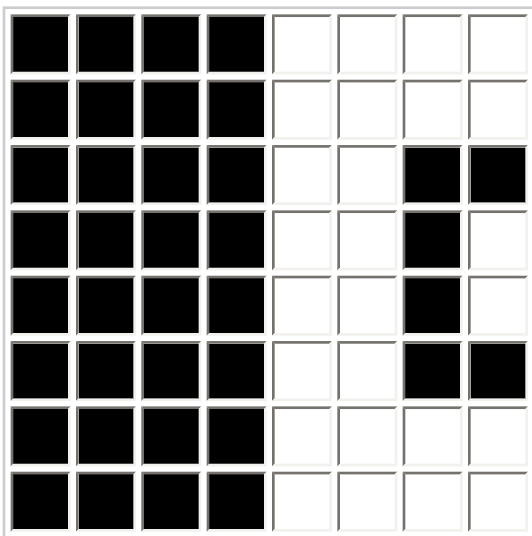


Name: _____ Date: _____

Quiz 10

1. We have seen that, for a fixed n , there may be many different isomers of the saturated hydrocarbon C_nH_{2n+2} . However, any two isomers will have the same number of chemical bonds. How many chemical bonds are there in a saturated hydrocarbon C_nH_{2n+2} ?
2. Construct a quadtree for the given image. Note the grid lines are for reference only and are not part of the image.



3. The ideal gas law for n moles of gas at pressure P , volume V , and temperature T is $PV = nrT$, where r is the universal gas constant obtained by multiplying Boltzmann's constant by Avogadro's number. Solving for pressure, we obtain the expression $P = nrT/V$. Construct the tree that represents the expression $((n * r) * T) / V$ for the pressure P .

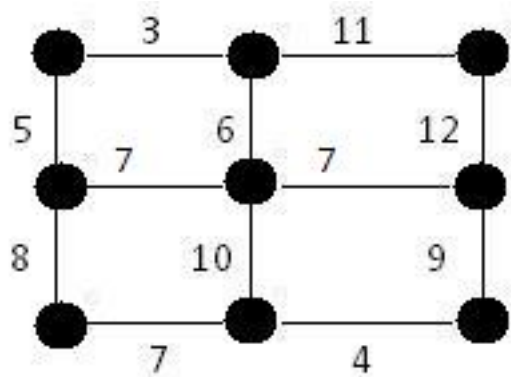
4. Compute the value of the following postfix expression. $4 \ 5 \ 1 \ + \ 2 \ / \ *$

5. Use Kruskal's Algorithm to find a minimum spanning tree.

Let e be an edge of minimum weight among all edges in

$E \setminus F$ for which $F \cup \{e\}$ contains no cycle.

Let $F = F \cup \{e\}$.



6. Use Prim's Algorithm to find a minimum spanning tree.

Let e be an edge of minimum weight among all edges in

$E \setminus F$ that connect an endpoint of an edge from F to a vertex that is not an endpoint of an edge from F .

Let $F = F \cup \{e\}$.

7. Is $O(n^2) \subseteq O(n \lg n)$?

Is $O(n - 1) \subseteq O(n^2)$?