Assignment #4
Course: CSD201
Time: 120 minutes

Part A. (8.0 pts) Write a Java program (with a main function for demo) to do:

- class Phone
- {
  - int ID; // unique for each object
  - string name;
  - int price;
  - int year;
  - int amount;
- }

- class Node
- {
  - Phone info; // use info.ID as the key value for node
  - Node left,right;
  - Node(Phone x){...}
- }
-
- class AVLTree
- {
  - Node root;
  - AVLTree() {...}
  - void insert(Phone x) {... }
  - void visit(Node p) {...}
  - int height(Node p) {...}
  - int balanceFactor(Node p) {...}
  - void breadth() {...}
  - void preOrder(Node p) {...}
  - void inOrder(Node p) {...}
  - void postOrder(Node p) {...}
  - Node search(Phone x) {...}
  - Phone find_Min_price() {...}
  - Phone find_Newest_Phone() {...}
  - Phone find_Max_Value() {...} // value = price*amount
  - void deleteByMerging(int x) {...}
  - void deleteByCopying(int x) {...}
  - void deleteNode(int x){...}
- }

Part B. (2.0 pts) What is a heap? Describe and give one example. Compare the heap structure with the binary tree structure.

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