CSE 8B: Discussion Section

PSA7: Applet and Recursion

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Topics to be covered

- Overview of PSA7
- Details about startup files
- Recursion [Important]
- Live coding examples
Methods of KeyListener

public void keyPressed(KeyEvent e) ;
public void keyReleased(KeyEvent e);
public void keyTyped(KeyEvent e) ;

Where to find the methods of such Java interface: Check java documentation.
Example:http://docs.oracle.com/javase/7/docs/api/java/awt/event/KeyListener.html
A sample KeyListener

This listener listens to the characters typed by user and simply prints on command prompt/console

MyKeyListener implements KeyListener {
    public void keyPressed(KeyEvent e) {}
    public void keyReleased(KeyEvent e) {}
    public void keyTyped(KeyEvent e) {
        char c = e.getKeyChar();
        System.out.println(c);
    }
}
Recursion

➔ Method calls itself
➔ You must have a base case when method will not call itself.
➔ Need to understand flow of control
Understanding flow of control - Example-1

What will be printed?

```java
public class MyClass {
    public void method1(int i){
        System.out.println(i);
        method2(i-1);
    }
    public void method2(int j){
        System.out.println(j);
        method3(j-1);
    }
    public void method3(int k){
        System.out.println(k);
    }
}
public static void main(String[] args) {
    System.out.println("Program starts");
    MyClass obj = new MyClass();
    obj.method1(3);
    System.out.println("Program Ends");
}
```

Answer:

Program starts
3
2
1
Program Ends
public class MyOtherClass {
    public void method1(int i) {
        method2(i - 1);
        System.out.println(i);
    }
    public void method2(int j) {
        method3(j - 1);
        System.out.println(j);
    }
    public void method3(int k) {
        System.out.println(k);
    }
    public static void main(String[] args) {
        System.out.println("Program starts");
        MyOtherClass obj = new MyOtherClass();
        obj.method1(3);
        System.out.println("Program Ends");
    }
}

Answer:
Program starts
1
2
3
Program Ends
Printing numbers 10 to 1 using recursion

What will be printed? Answer:
10, 9, 8, 7, 6, 5, 4, 3, 2, 1,
Let's draw this recursively.
public class TurtleRecursion{
    public void walkInStyle(Turtle turtle, double initialLength, int angle) {
        if (initialLength < 1 ) return;  //Base case
        turtle.turn(angle);
        turtle.forward((int)initialLength);
        walkInStyle(turtle, initialLength*0.9, -1*angle);// recursively calls itself
    }
    public static void main(String[] args) {
        TurtleRecursion tr = new TurtleRecursion();
        World earth = new World(300,300);
        Turtle turtle = new Turtle(earth);
        turtle.penUp();
        turtle.moveTo(0, earth.getHeight());
        turtle.penDown();
        tr.walkInStyle(turtle,50,75); }}
Questions