Announcements

Assignment 3

SUMMARY
In this assignment you will write a program to simulate stage lighting.

DEADLINE
This assignment is due on Wednesday, May 30 at 11:00 pm.

SPECIFICATION
You will create two classes to simulate a stage backdrop with colored lighting fixtures. The program will allow a user to see the beams from the light fixtures and the color-mixing that occurs. Create a package called \texttt{stagedesigner} with the following two public classes:

\textbf{Light}

The class \texttt{Light} will represent a single lighting fixture.

\textbf{Constructors:}

- \texttt{public Light(int x, int y, double direction, double angle, Color color)}
  - \texttt{x} ... the \texttt{x} coordinate of the light (origin of the beam)
  - \texttt{y} ... the \texttt{y} coordinate of the light (origin of the beam)
  - \texttt{direction} ... the direction of the beam in radians
  - \texttt{angle} ... the width of the beam in radians
  - \texttt{color} ... the color of the beam

\textbf{Methods:}

- \texttt{public Color getColor()}
  - Return the color of the light fixture
- \texttt{public boolean inBeam(int px, int py)}
  - Return \texttt{true} if the coordinates (\texttt{px}, \texttt{py}) are in the beam, \texttt{false} otherwise.
Size Comparison: N ints

- The array requires
  - Reference... 4 bytes
  - $(\text{int... 4 bytes}) \times n$
  - $= 4n + 4$
- The linked list requires
  - Reference... 4 bytes
  - $(\text{int... 4 bytes + Reference... 4 bytes}) \times n$
  - $= 8n + 4$
- Of course, this overhead becomes relatively smaller with larger data types.

Size Comparison: N Objects

- Say we have an object of size 64 bytes
- The array requires
  - Reference... 4 bytes
  - $(\text{Object... 64 bytes}) \times n$
  - $= 64n + 4$
- The linked list requires
  - Reference... 4 bytes
  - $(\text{Object... 64 bytes + Reference... 4 bytes}) \times n$
  - $= 68n + 4$