YEAH Outline: Assignment 1

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Introducing: Your Early Assignment Help (YEAH!) hours
Confidence boosters, tips and tricks to help you get started on assignments

Motivation: Conway's Game of Life
Simple rules that produce surprisingly interesting patterns
(some of these patterns are included with the assignment, so check them out)
A few scientists have dedicated their lives to studying these patterns
Largest named pattern: the "caterpillar," weighing in at over 11 million cells
Life is "Turing complete": a large enough game (even if sketched out in pencil and
        paper, or played out on a plastic checkers board) can do anything your
        computer can
It also has a "speed of light," among other interesting parallels with physics

A brief tour of the Life graphics library
Step 1: make a LifeDisplay   LifeDisplay display;
Step 2: set its size   display.setDimensions(numRows, numCols);
Step 3: fill in some cells   display.drawCellAt(row, column, age);
Call pause(numMilliseconds) to slow down the animation
The starter code gives you the function waitForEnter, which (wait for it...) waits
        for the user to press Enter
The assignment handout gives you code to detect a mouse click—use it!

Reading files
Opening a file: if opening fails, be sure to call clear() on your ifstream before
        reusing it! Symptom: typing in a nonexistent filename gets you stuck in an
        infinite loop, with the program refusing to accept *any* following filename.

Reading a file: look out for off-by-one bugs! This doesn't do what you'd expect:
```
    while(!infile.fail()) { // <-- OFF BY ONE!
        string line;
        getline(infile, line);
        // do stuff with line
    }
```
After the last getline, the above uses line before checking if the file has failed,
resulting in an extra blank line or a duplicate last line. The loop-and-a-half idiom is
your friend:
```
    while(true) {
        string line;
        getline(infile, line);
        if(infile.fail()) break; // checks last line correctly
        // do stuff with line
    }
```

C++ skillz: pass-by-value and pass-by-reference
Pass-by-value (makes a copy):

```
void shoutMessage(string message);
```
Pass-by-reference (gives you the original):

```
void mangleString(string &toBeMangled);
```
Copies are safer (imagine faxing your ID vs. lending it out), but take time to make
We'll be solidifying your understanding of this in section, future assignments
For now, though: use the & to pass the two big, complicated things, namely, your
    LifeGraphics and Grid(s), and leave it out for everything else

General assignment tips
Start early!
Play with the reference solution
Visit the LaIR: Sun-Thu, 6pm-midnight
    (but starts **Monday**, 10/1, not Sunday—my bad!)

Questions?