This week in section, you will write a few short programs to get you started with Java.

1. **The Fibonacci sequence**

In the 13th century, the Italian mathematician Leonardo Fibonacci—as a way to explain the geometric growth of a population of rabbits—devised a mathematical sequence that now bears his name. The first two terms in this sequence, $Fib(0)$ and $Fib(1)$, are 0 and 1, and every subsequent term is the sum of the preceding two. Thus, the first several terms in the Fibonacci sequence look like this:

\[
\begin{align*}
Fib(0) &= 0 \\
Fib(1) &= 1 \\
Fib(2) &= 1 \quad (0 + 1) \\
Fib(3) &= 2 \quad (1 + 1) \\
Fib(4) &= 3 \quad (1 + 2) \\
Fib(5) &= 5 \quad (2 + 3)
\end{align*}
\]

Write a program that displays the terms in the Fibonacci sequence, starting with $Fib(0)$ and continuing as long as the terms are less than 10,000. Thus, your program should produce the following sample run:

```
Fibonacci
This program lists the Fibonacci sequence.
0
1
1
2
3
5
8
13
21
34
55
89
144
233
377
610
987
1597
2584
4181
6765
```

You should make sure that the maximum term size (10,000 in this example) is specified as a named constant so that the program is easy to change.
2. Centering text on the screen
Your job is to write a GraphicsProgram that displays the message

\[
\text{CS106A rocks my socks!}
\]

so that the label appears in SansSerif 28-point font, centered horizontally and vertically in
the middle of the graphics window. The screen should therefore look something like this:

![CenteredText](image)

You can find the width of a label by calling `label.getWidth()` and the height it extends
above the baseline by calling `label.getAscent()`. If you want to center a label, you
need to shift its origin by half of these distances in each direction.

3. Drawing a face
Your job is to draw a robot-looking face like the one shown in the following sample run:

![RobotFace](image)

This simple face consists of four parts—a head, two eyes, and a mouth—which are
arranged as follows:

- **The head.** The head is a big rectangle whose dimensions are given by the named
  constants `HEAD_WIDTH` and `HEAD_HEIGHT`. The interior of the head is gray, although it
  should be framed in black.

- **The eyes.** The eyes should be circles whose radius in pixels is given by the named
  constant `EYE_RADIUS`. The centers of the eyes should be set horizontally a quarter of
  the width of the head in from either edge, and one quarter of the distance down from
  the top of the head. The eyes are yellow.

- **The mouth.** The mouth should be centered with respect to the head in the \( x \)-dimension
  and one quarter of the distance up from the bottom of the head in the \( y \)-dimension.
  The dimensions of the mouth are given by the named constants `MOUTH_WIDTH` and
  `MOUTH_HEIGHT`. The mouth is white.

If you were drawing a face, how would you make it more interesting?