One way to approximate the area of a region is to approximately fill the region with rectangles and then total up the area of the rectangles. The figure at right shows how these rectangles might be chosen when the region is a semi-circle. The diameter is divided into n equal pieces and then a rectangle is erected over each piece so that it's height is the length of the perpendicular segment going up to the middle of the rectangle to the semi-circle.

Assume you will be implementing a `DualSliderProgram`, and that `getA()` will represent the number of rectangles desired (n), while `getB() * 10.0` is the diameter of the semicircle.

Compute the area of the semi-circle and the sum of the areas of the rectangles. Display the semicircle and the bars, then have both area values (with three digits to the right of the decimal point) appear as labels in the lower half of the window.

The actual area is 113.490

The area of the rectangular approximation is 114.327
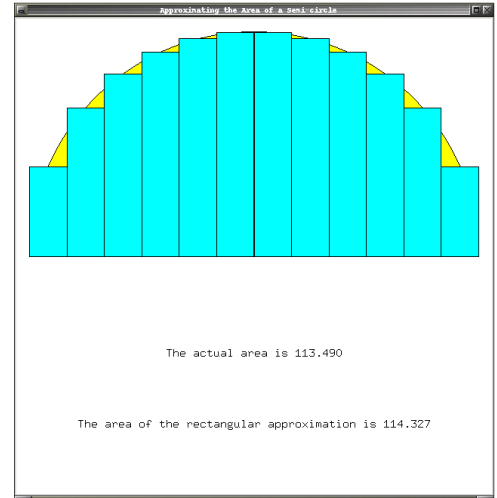
1. List and describe the inputs needed to provide a solution to this problem.

2. Using the principle of **decomposition**, complete breaking this problem down into subproblems by giving a *general algorithm* to solve it. Do not get side–tracked into too much detail.

```
1.  Initializations -- window width and height (winW, winH), number of
                       bars (numBars), diameter of the semicircle (diameter)
2.  Draw semicircle centered in window with "diameter" size and color yellow
3.  Determine the width of one bar (barWidth)
```

Continued on back.

3. Assume that one subproblem is to draw a single bar, `makeBar()`.

   (a) What information is needed in order to draw a bar?

   (b) Give the header for this method:

   (c) Give the body of this method: