CSE 142, Autumn 2008
Programming Assignment #6: Baby Names (20 points)
Due: Wednesday, November 12, 2008, 11:30 PM

Special thanks to Stanford lecturer Nick Parlante for the original concept of this assignment!
also see: http://www.peggyorenstein.com/articles/2003_baby_names.html

This assignment focuses on reading input files. Turn in files named `BabyNames.java` and `creative.txt`. You will need `DrawingPanel.java`, which you used on previous assignments, to write this program.

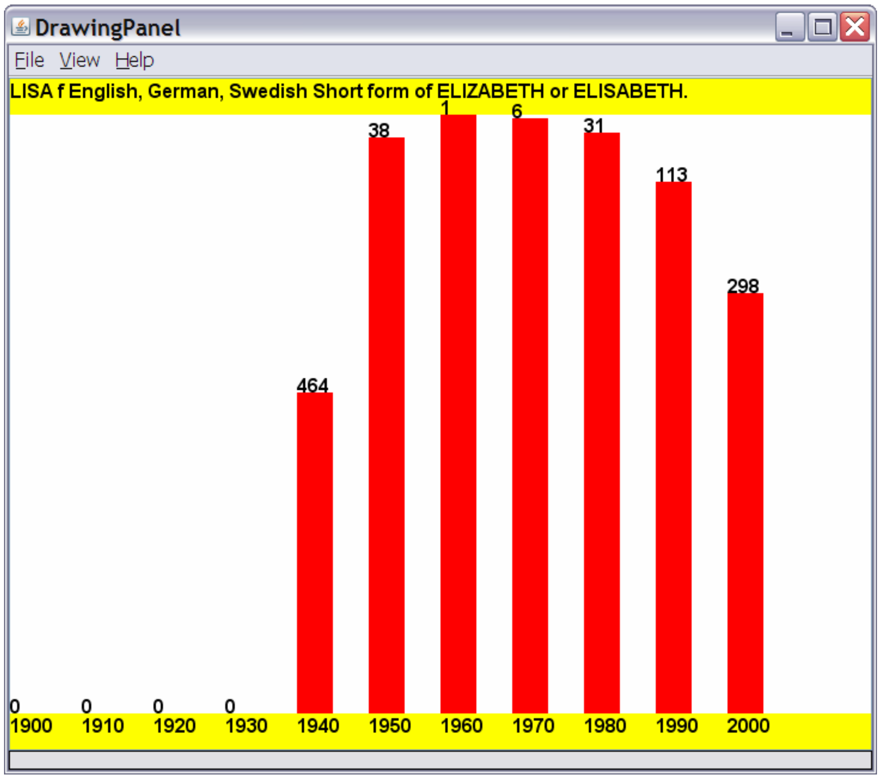
Program Description:

Every 10 years, the Social Security Administration gives data about the 1000 most popular boy and girl names for children born in the US. This data is provided on the web at http://www.ssa.gov/OACT/babynames/. Your task in this program is to prompt the user for a name, and then to display the name's meaning and popularity statistics about that name for each decade since 1900. You will display the data as console text and as a graphical bar chart on a `DrawingPanel`. The input data about names' popularity rankings and meanings comes from two input files provided on our web site.

Your program gives an introduction and then prompts the user for a first name. It reads a file searching for that name, case-insensitively (that is, you should find the name regardless of the capitalization the user uses when typing it). If the name is found in the file, you will print a line of statistics about that name's popularity in each decade. You will also look up that name's meaning in a second file and display information about its meaning.

```
This program graphs the popularity of a name
in statistics recorded since the year 1900.

Type a name: lisa
Lisa 0 0 0 0 464 38 1 6 31 113 298
LISA f English, German, Swedish Short form of ELIZABETH or ELISABETH.
```



Input Data and Files:

Your program reads data from two files. Download them from our web site to the same folder as your program.

1. `names.txt`: *popularity rankings for each name in each decade from 1900-2000*

Each line of `names.txt` contains a name followed by that name's rank in 1900, 1910, 1920, etc. The default file has 11 numbers/line, so the last represents the ranking in 2000. Rank #1 was the most popular that year, while rank #999 was not popular. Rank 0 means the name did not appear in the top 1000. For example:

```
Lionel 387 344 369 333 399 386 408 553 492 829 972
Lisa 0 0 0 0 464 38 1 6 31 113 298
Lise 0 0 0 0 0 997 0 0 0 0 0
```

"Lionel" was #387 in 1900 and is slowly decreasing. "Lisa" first made the list in 1940 and peaked in 1960 at #1.

Once the user types a name, search each line of `names.txt` to see if it has data for that name. If the name is found, output its data line to the console, then construct a `DrawingPanel` to graph the data. The graphical output is described on the next page. Your panel must exactly reproduce the specified appearance for the same input.

If the name is not found, output a "not found" message and not draw any data. No `DrawingPanel` should appear.

```
This program graphs the popularity of a name
in statistics recorded since the year 1900.

Type a name: zOIDberG
"zOIDberG" not found.
```

Though the data shown above has 11 decades' worth of rankings, your program should work properly with any number of decades of data (at least 1). Since there is a limit to the size of the `DrawingPanel`, you'd only be able to see data from 12 decades, but your code should process as many decades of data as it finds in the line. **Do not assume that there will be exactly 11 decades when writing this program**. On the course website is a file named `names2.txt` with 8 decades of data to help you test this behavior.

2. `meanings.txt`: *descriptions of the meanings of each name*

If the name is found in `names.txt`, you should also read `meanings.txt` to find its meaning. The line containing the name's meaning should be printed to the console and also drawn on the `DrawingPanel`. Every name in `names.txt` is also in `meanings.txt`, so you do not need to worry about a name having rankings but no meaning data. Some names have long meanings that may stretch past the right edge of the `DrawingPanel`.

Each line of `meanings.txt` contains a name in upper case, followed by the name's meaning. For example:

```
LIONEL m French Pet form of LON
LISA f English, German, Swedish Short form of ELIZABETH or ELISABETH.
LISE f French French short form of ELISABETH
```

Note that even though the two input files contain different data, the task of searching for a name in `names.txt` is very similar to the task of searching for a name in `meanings.txt`; both contain the name as the first token of each line. Your code should take advantage of this fact and should avoid redundancy.

Creativity Aspect (`creative.txt`):

Along with `BabyNames.java`, submit a file `creative.txt` containing two lines representing data for a new name not found in the file. The first line should be the name, followed by 11 integers representing your proposed rankings for this name, in the format shown for `names.txt`. The second line should be the name's meaning, in the same format as the lines of `meanings.txt`; either make it up or look it up on a web site. You can submit a screenshot of your name's output to Facebook. The following is an acceptable `creative.txt` file:

```
Quagmire 0 997 984 856 715 632 543 402 169 84 1
QUAGMIRE m English A lascivious airline pilot.  Giggity giggity, all right!
```

Graphical Output:

The panel's overall size is 720x560 pixels. Its background is white. It has yellow filled rectangles along its top and bottom, each being 30 pixels tall and spanning across the entire panel, leaving an open area of 720x500 pixels in the middle. The line of data about the name's meaning appears on the panel at (0, 16).

Each decade is represented by a width of 60 pixels. The bottom yellow rectangle contains black labels for each decade, at y=546. For example, the text "1900" is at (0, 546) and "1910" is at (60, 546).

Rank	Top y
1	30
2, 3	31
4, 5	32
6, 7	33
...	...
996, 997	528
998, 999	529
0	530

Starting at the same x-coordinate, a red bar shows the name ranking data over each decade. The bar is 30px thick (½ as wide as each decade). The table at right shows the mapping between rankings and y-values of the tops of bars. Y-values start at 30, and there is a vertical scaling factor of 2 between pixels and rankings; divide a ranking by 2 when calculating its y-coordinate. For example, a ranking of 38 in 1950 results in a 30x481 bar occupying (300, 49) through (329, 529).

At the same coordinate as the top-left of each red bar, black text shows the name's rank for that decade. For example, Lisa was #38 in 1950, so "38" appears at (300, 49). A 0 rank means the name wasn't in the top 1000. No red bar should appear in such a case, and "0" should be drawn at the bottom at y=530. For example, Lisa's 0 in 1910 is drawn at (60, 530).

Implementation Guidelines:

We suggest you begin with the text output and file processing, then any "fixed" graphical output, and then the red bars. The 0-ranking case is particularly tricky to draw, so you may want to do this last. (Hint: Treat rank 0 as a rank of 1000.)

Your program should work correctly regardless of the capitalization the user uses to type the name. If the user types `"LiSa"` or `"lisa"`, you should find it even though the input files have it as `"Lisa"`. and `"LISA"`.

Draw text labels on the `DrawingPanel` using the `drawString` method of the `Graphics` object. To draw an `int` as text, you can convert it into a `String` using the `+` operator with an empty string. For example, for an `int` variable named `n` with value `100`, the expression `"" + n` yields the string `"100"`. To draw this at (50, 120), you could write:

```
    g.drawString("" + n, 50, 120);
```

All text is drawn using bold `"SansSerif"` font, size 16. Set this using the `Graphics` object's `setFont` method:

```
    g.setFont(new Font("SansSerif", Font.BOLD, 16));
```

Stylistic Guidelines:

You should have the following **two class constants**. If the constant values are changed, your output should adapt.

- The **starting year** of the input data, as an integer (default of `1900`)
  e.g. If you change the start year to 1825, the program should assume the data comes from 1825, 1835, etc.
- The **width** of each decade on the `DrawingPanel`, as an integer (default of `60`)
  e.g. If you change the width to 50, each red decade bar is 50px apart and 25px thick. The panel's width should also adjust. The original width of 720 mentioned previously really comes from 60px per decade times 12 decades. But if you change the constant to 50, the panel's width becomes 600px.

We will be especially picky about redundancy. For full credit, your methods should obey these constraints:

- The `main` method should not draw on a `DrawingPanel`, nor read lines of input from a file (`nextLine`).
- The method that asks the user for a name must not also read lines of input from a file.
- Split the displaying of graphical data into at least two methods. For example, you could have one method to draw "fixed" graphics (yellow bars, etc.) and another for graphics that come from the file (red bars, ranks).

Your methods should be well-structured and avoid redundancy, and your `main` method should be a concise summary of the overall program. Avoid "chaining," which is when many methods call each other without ever returning to `main`.

For this assignment you are limited to the language features in Chapters 1 through 6 of the textbook. In particular, **you are not allowed to use arrays on this assignment.** Follow past stylistic guidelines about indentation, line lengths, identifier names, and localizing variables, and commenting at the beginning of your program, at the start of each method, and on complex sections of code. For reference, our solution occupies ~100 lines and has 4 methods other than `main`.