YEAH: Assignment 6 NameSurfer

Maya & Eddie

Interactors Recap

Main Interactors:

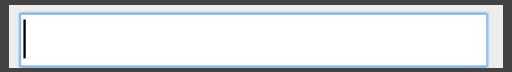
JButtons

```
JButton button = new JButton("Press me");
```

Press Me!

JTextFields

```
JTextField field = new JTextField(10);
add(field, SOUTH);
...
field.getText(); // returns string in field
```



Type something!

JLabels

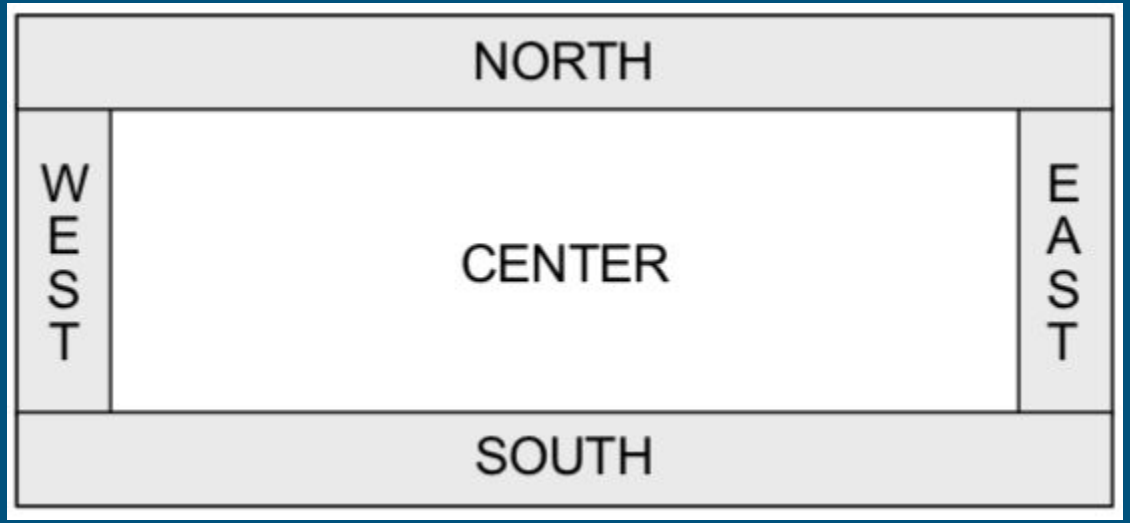
```
JLabel label = new JLabel("Hi");
```

Basically just a Label :(

Regions

4 of them!

Center is usually canvas, sides are for interactors



JButton Methods

Method	Description
`new JButton("text")`	Creates new button with given text string
`jb.getBackground()` `jb.setBackground(color);`	get or set background color on button
`jb.isEnabled()` `jb.setEnabled(boolean);`	get or set whether button is clickable
`jb.getFont()` `jb.setFont(font);`	get or set text font used for button text
`jb.getForeground()` `jb.setForeground(color);`	get or set text color on button
`jb.getIcon()` `jb.setIcon(icon);`	get or set icon image showing on button
`jb.getText()` `jb.setText("text");`	set or return text showing on the button

JTextField Methods

Method	Description
`new JTextField("text")` `new JTextField(columns)`	Create new text field of given size
`jtf.addActionListener(this);`	causes action events to occur when the user presses Enter on the field
`jtf.getActionCommand()` `jtf.setActionCommand("cmd");`	set/return a string to identify the action events that will occur in this field
`jtf.getText()` `jtf.setText("text");`	set/return text in the field

JLabels Methods

Method	Description
`new JLabel("text")`	Create new label with given text
`jl.getFont()` `jl.setFont(font);`	get/set text font used for label text
`jl.getForeground()` `jl.setForeground(color);`	get or set text color on label
`jl.getHorizontalAlignment()` `jl.setHorizontalAlignment(align);`	set or return horizontal alignment of text in the label; pass `JLabel.LEFT`, `CENTER`, or `RIGHT`
`jl.getText()` `jl.setText("text");`	set/return text in the label

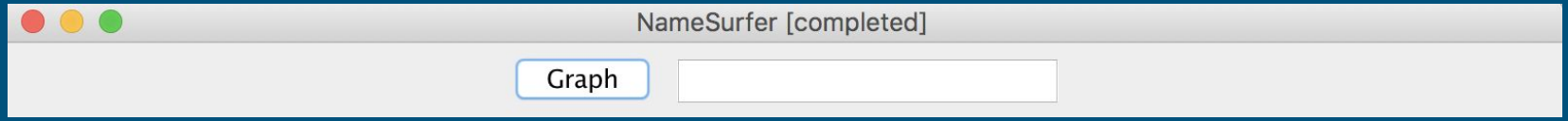
How to initialize Interactors

```
public void init() {
        Jbutton button = new JButton(“Graph”);
        add(button, NORTH);

        JTextField textField = new JTextField(20);
        textField.addActionListeners(this);
        add(textField, NORTH);

        addActionListeners(); // Listen for all button clicks
}
```

Adding Interactors

Order Matters!

- Since I added the JButton first, it appears first from left to right



How to use Interactors

```
public void actionPerformed(ActionEvent e) {
    String command = e.getActionCommand(); //return a string of what is clicked
    Object obj = e.getSource();
    if (command.equals("Graph") ) {
        // do whatever you want Graph to do
    } else if (command.equals("something else") {
        // do something else
    } else if (obj == textField) {
        String text = textField.getText() //returns whatever is typed in textField
        // do something with what is entered in textField
    }
}
```

Classes Recap

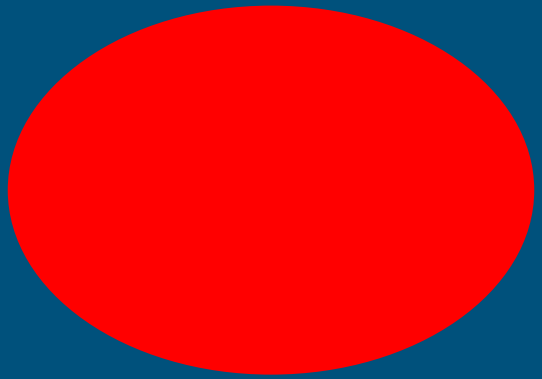
Classes = Blueprints

3 important things:

- What information does this variable store? ***Instance Variables***
- What can you do with this variable type? ***Methods***
- How do you create this variable type? ***Constructor***

Example: GOval

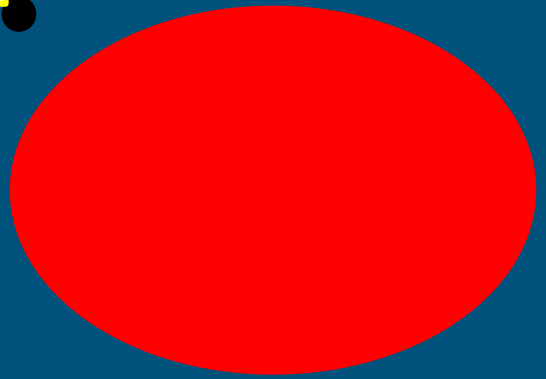
What information does this class need to store?



Example: GOval

What information does this class need to store?

```
private double x;
private double y;
```

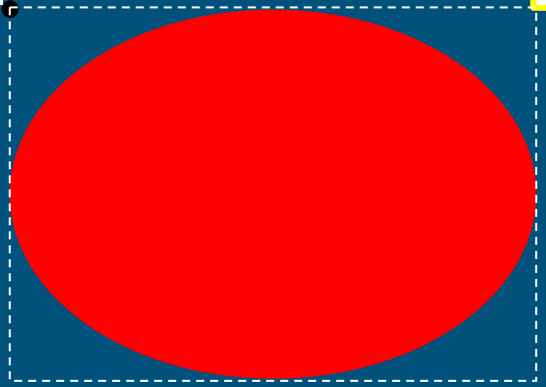


Example: GOval

What information does this class need to store?

```
private double x;
private double y;
```

```
private double width;
private double height;
```

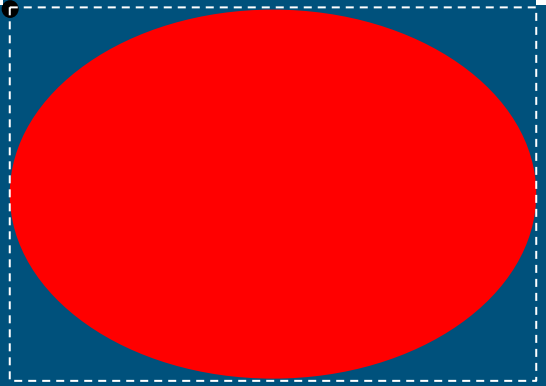


Example: GOval

What information does this class need to store?

```
private double x;
private double y;
```

```
private double width;
private double height;
```



```
private boolean isFilled;
```

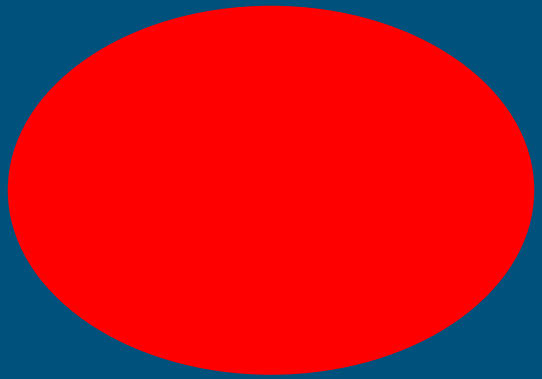
```
private Color color;
```

```
etc, etc, etc...
```

Example: GOval

What can you do with this variable type?

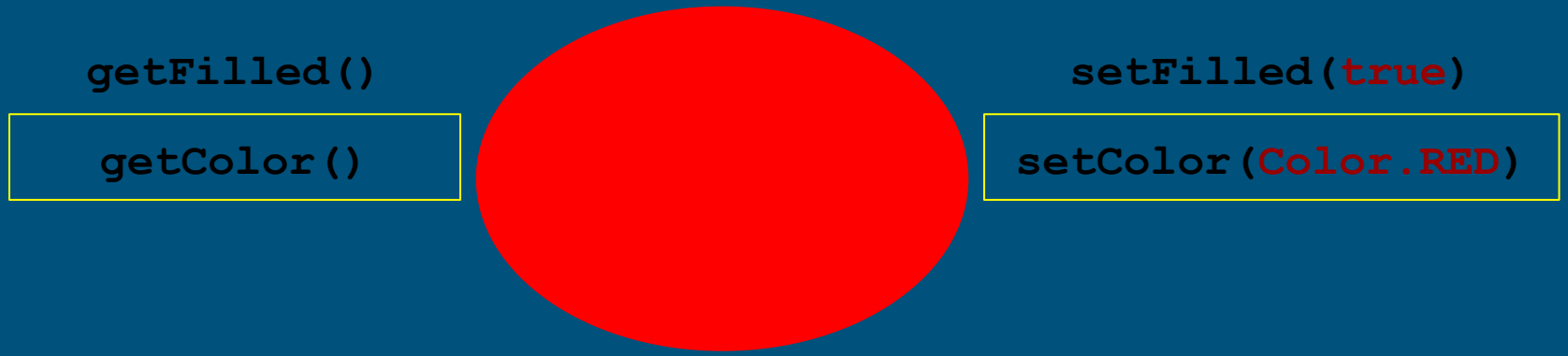
```
getFilled()
```



```
setFilled(true)
```

Example: GOval

What can you do with this variable type?

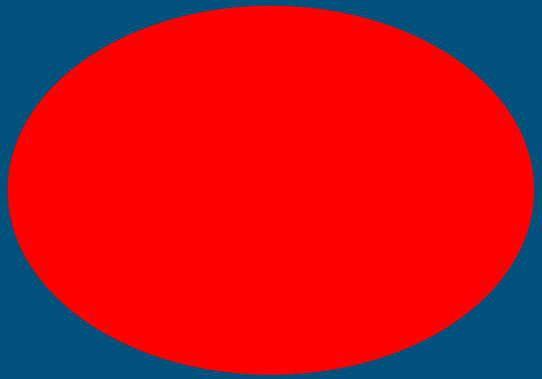


Example: GOval

What can you do with this variable type?

getters

```
getFilled()

getColor()
```



setters

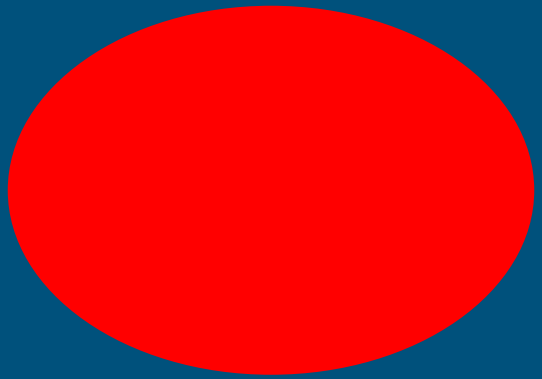
```
setFilled(true)

setColor(Color.RED)
```

Example: GOval

What can you do with this variable type?

getters

```
getFilled()
getColor()
getWidth()
getHeight()
...
```

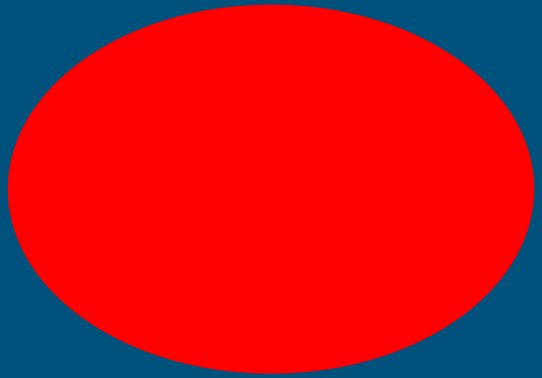


setters

```
setFilled(true)
setColor(Color.RED)
setWidth(true)
setHeight(true)
...
```

Example: GOval

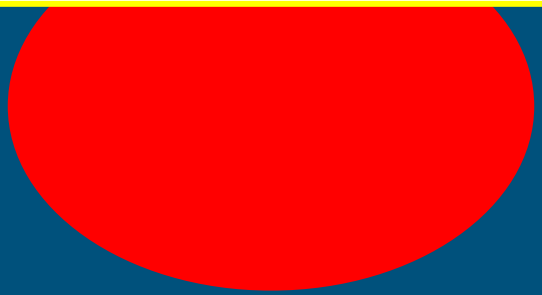
How does the constructor **create** a GOval?



Example: GOval

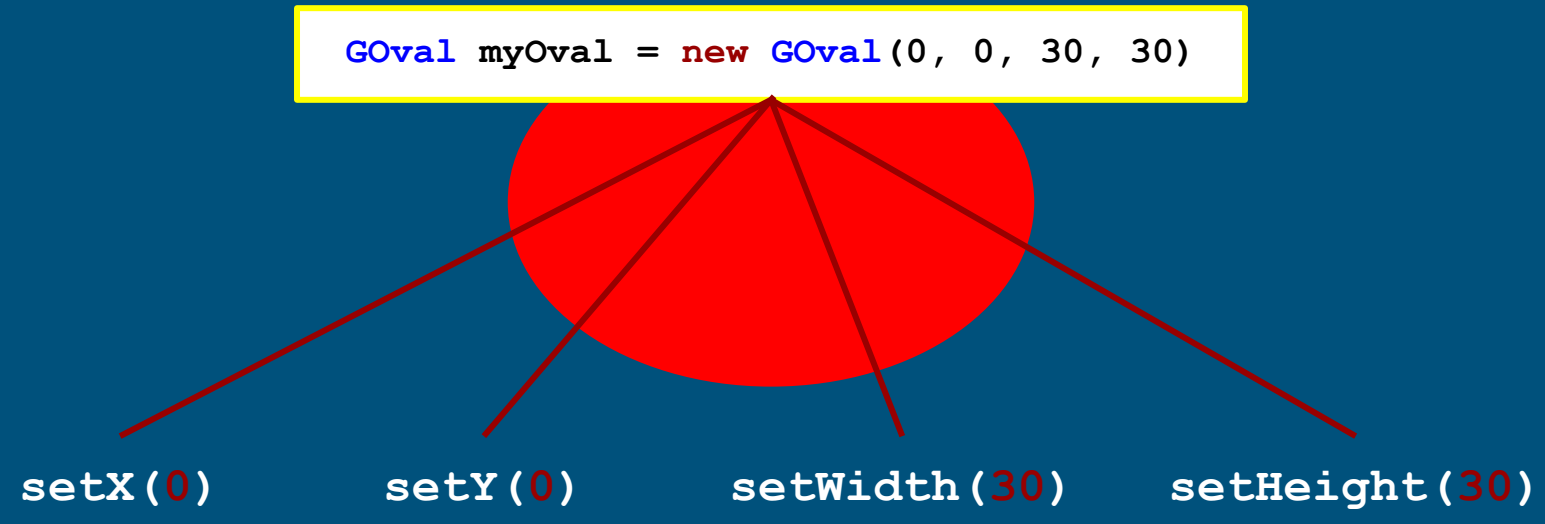
How does the constructor **create** a GOval?

```
GOval myOval = new GOval(0, 0, 30, 30)
```



Example: GOval

How does the constructor **create** a GOval?



Milestones

Interactors

Class 1: NameSurferEntry

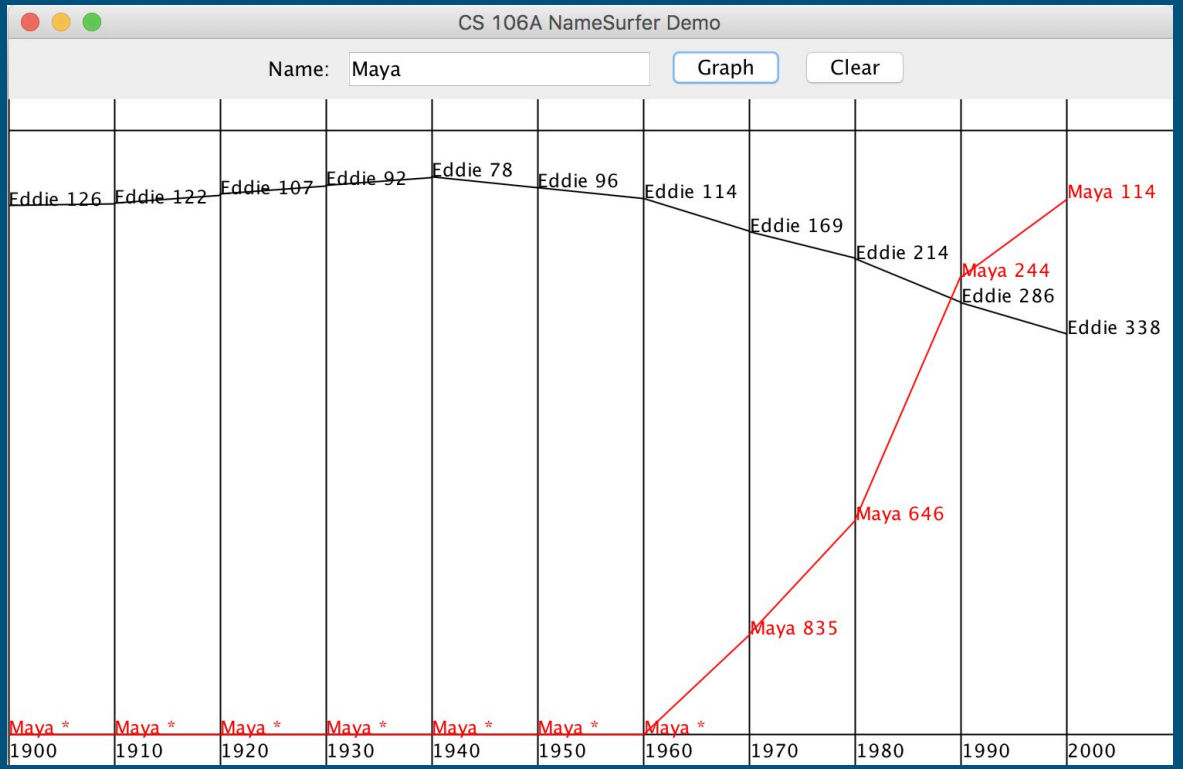
Class 2: NameSurferDatabase

DrawBackground

Put it all together! (`redraw()`)

Assignment 6: NameSurfer

One of my personal favorites!

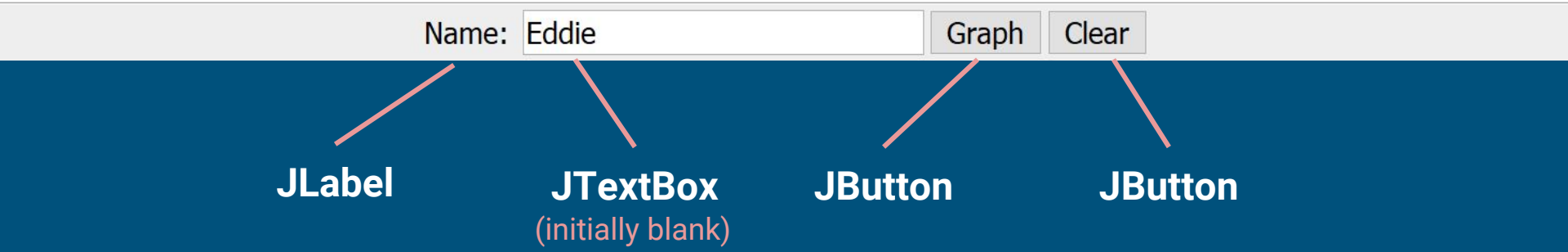


[Show demo JAR]

Interactors

Add a bunch of text boxes and buttons to the screen.

Milestone 1: Interactors



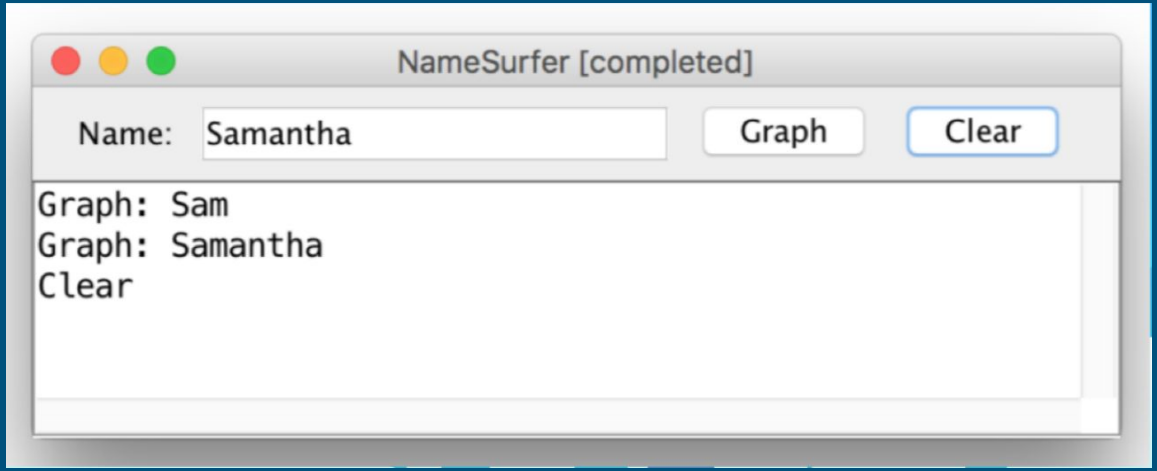
If “enter” is pressed in JTextBox, or JButton “Graph” pressed, should add Graph.

- Name is case-insensitive
- If no data found, don’t add line.

Interactors Testing

Use the fact that it starts out as a console program to your advantage!

Check that your interactors are working.



NameSurferEntry

Goal: create a custom variable that stores the information in one NameSurfer entry

Milestone 2: NameSurferEntry

NameSurferEntry: One entry in our NameSurfer database.

- NameSurferEntry(String line)

Name and popularity in each decade from 1900 to 2000.
“Sam 58 69 99 131 168 236 278 380 467 408 466”

Need to parse string and store information.

Milestone 2: NameSurferEntry

“Maya 0 0 0 0 0 0 0 835 646 244 114”

Edge case: 0’s mean a name wasn’t in the top 1000 names for that decade.

You will draw those at the **bottom** of the NameSurfer graph.

Classes = Blueprints

3 important things:

- What information does this variable store? ***Instance Variables***
- What can you do with this variable type? ***Methods***
- How do you create this variable type? ***Constructor***

Class = NameSurferEntry

3 important things:

- What information does this variable store? ***???***
- What can you do with this variable type? ***getName, getRank, toString***
- How do you create this variable type? ***NameSurferEntry(String line);***

Class = NameSurferEntry

3 important things:

- What information does this variable store? ***???***

  What data structure(s) will you use?

- What can you do with this variable type? ***getName, getRank, toString***

  public methods MUST stay the same!

- How do you create this variable type? ***NameSurferEntry(String line);***

  hint: str.split(“ “);

NameSurferDatabase

Goal: store a collection of NameSurferEntries.

Milestone 3: NameSurferDatabase

Each line in text file contains info for **one** NameSurferEntry

Read the file and store a collection of NameSurferEntries.

(data structure?)

Class = NameSurferDatabase

3 important things:

- What information does this variable store? ***???***
- What can you do with this variable type? ***findEntry(String name)***
- How do you create this variable type? ***NameSurferDatabase(String filename);***

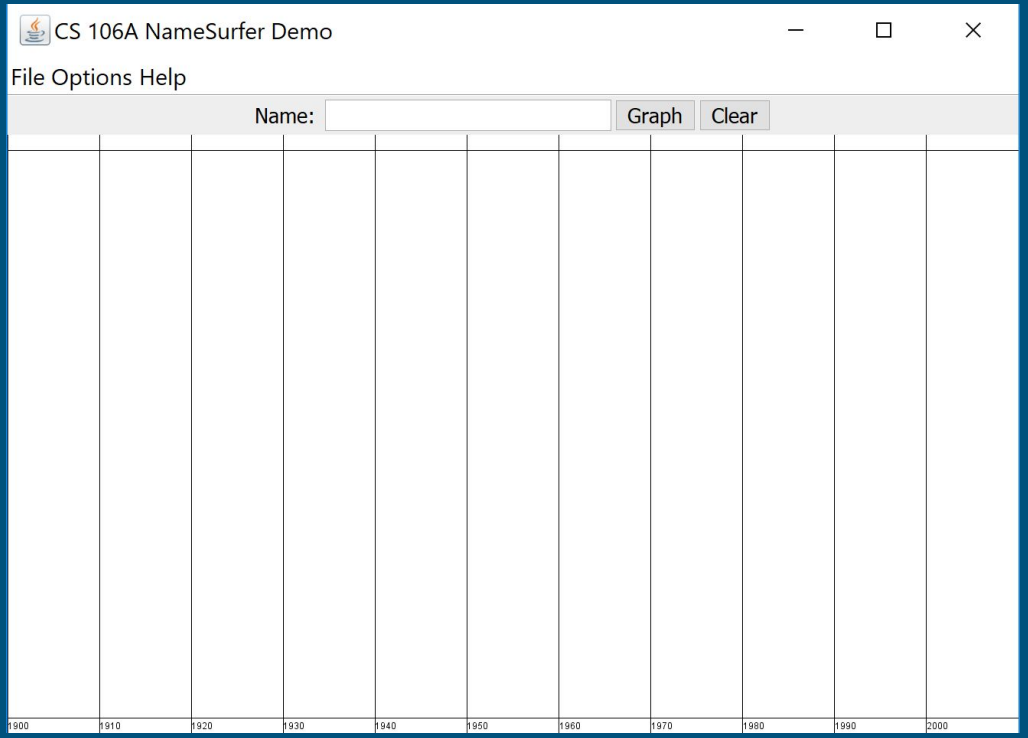
Milestone 3: NameSurferDatabase

You **may** (and probably should) implement your own private helper methods.

However, you may NOT modify the public method headers.

Milestone 4: Drawing the Background

11 Buckets



10 Vertical GLines

Milestone 5: Bringing All Together

`redraw()`

- Give the interactors their real functionality
- Find the NameSurferEntry for an input name and graph it
- Colors go: **black, red, blue, magenta, black, red, blue...**

Milestone 6:
You insert here!

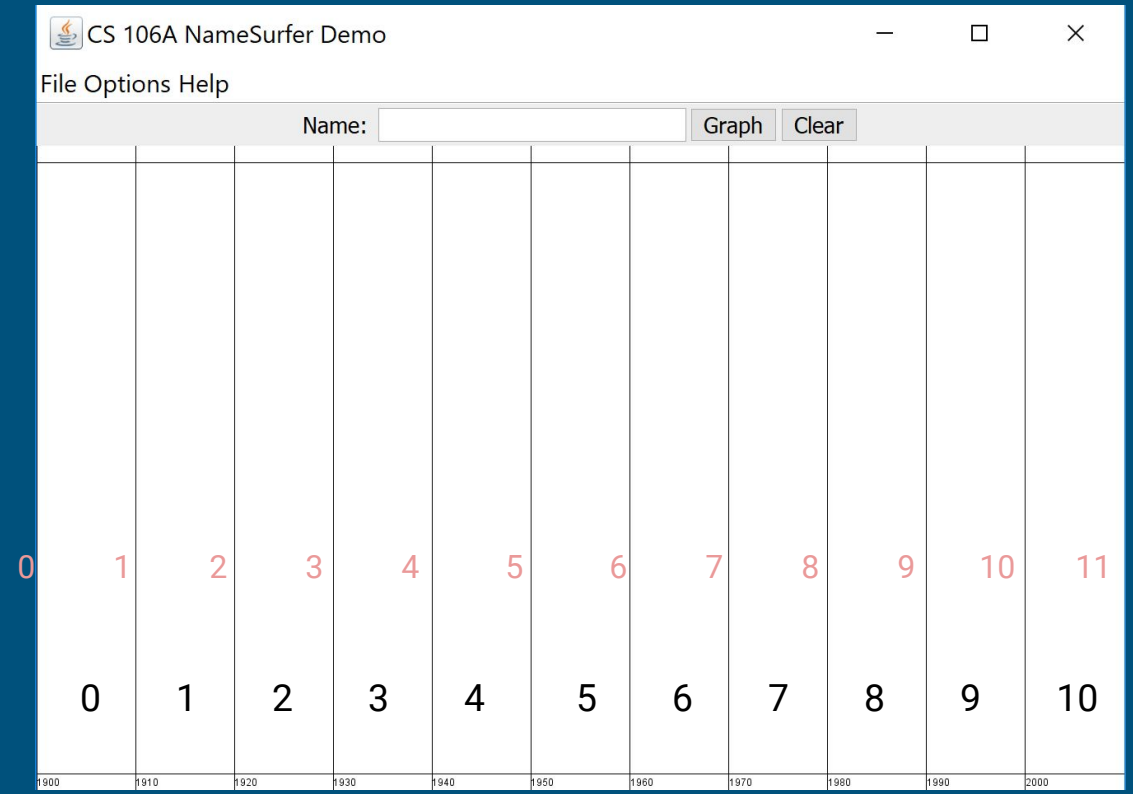
We give you datasets, you do something cool with them! (You can submit this to the graphics contest!)

See: **Data Visualization Extension Handout**

Common Pitfalls!

Off-by-One in Graphics

- 11 “Buckets”
  - 11 Vertical Lines
  - 11 GLabels
- 10 Connecting GLines



Common Pitfalls!

Can only use getHeight() AFTER the canvas has been added

- Not in constructor, not in init()

Not using constants!

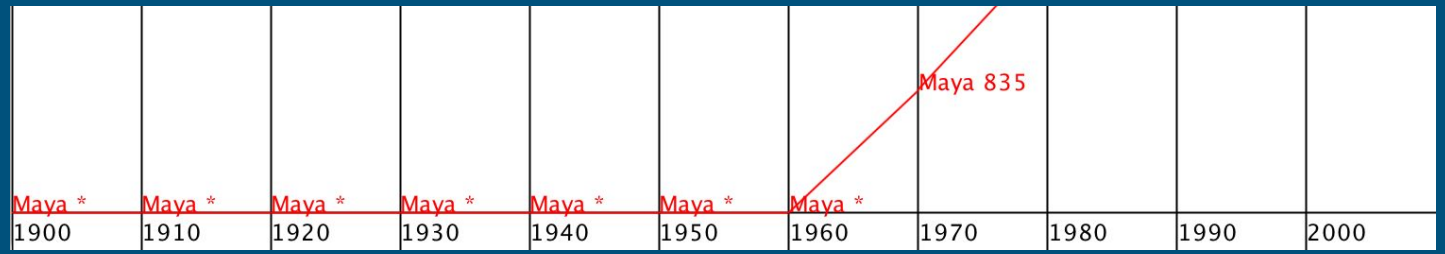
- Use the constants we give you!

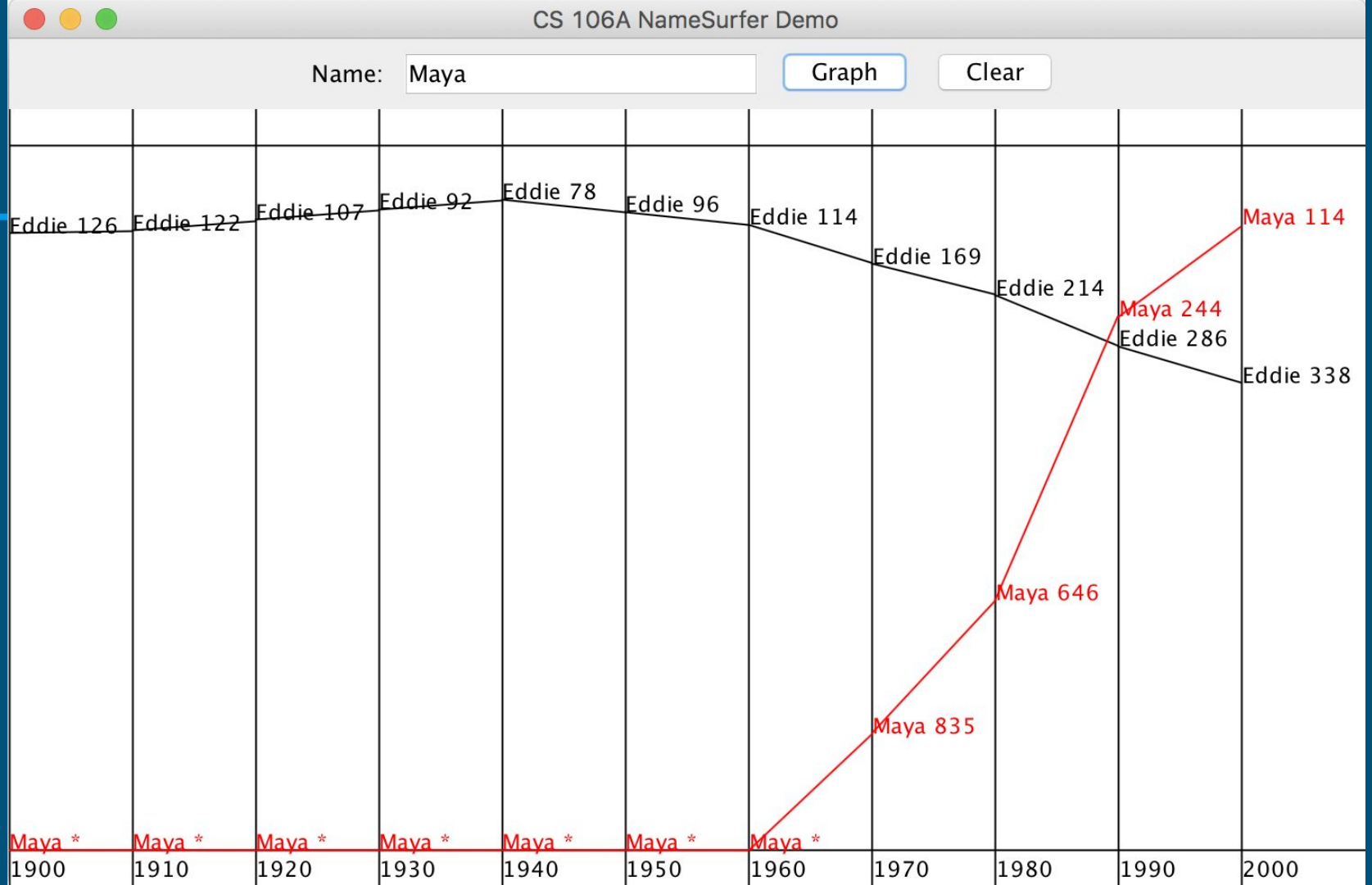
```
public interface NameSurferConstants {

/** The width of the application window */
    public static final int APPLICATION_WIDTH = 800;

/** The height of the application window */
    public static final int APPLICATION_HEIGHT = 600;

/** The name of the file containing the data */
    public static final String NAMES_DATA_FILE = "names-data.txt";

/** The width of the text field in the NORTH of the window */
    public static final int TEXT_FIELD_WIDTH = 16;

/** The first decade in the database */
    public static final int START_DECADE = 1900;

/** The number of decades */
    public static final int NDECADES = 11;

/** The maximum rank in the database */
    public static final int MAX_RANK = 1000;

/** The number of pixels to reserve at the top and bottom */
    public static final int GRAPH_MARGIN_SIZE = 20;

/** The number of pixels between the baseline of the decade labels and the bottom of the window */
    public static final int DECADE_LABEL_MARGIN_SIZE = GRAPH_MARGIN_SIZE / 4;

}
```

Common Pitfalls!!

Rank goes from 1 to 1000!

- Must handle edge case when getRank() is 0
  - (should graph to the bottom of the graph)




CS 106A NameSurfer Demo
Name:
Maya
Graph
Clear
Eddie 126
Eddie 122
Eddie 107
Eddie 92
Eddie 78
Eddie 96
Eddie 114
Eddie 169
Eddie 214
Eddie 286
Eddie 338
Maya 114
Maya 244
Maya 646
Maya 835
Maya *
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

But first: Sandcastle!

Goal: get practice using collections.

(seem familiar?)

cough cough section 6 problem 7

But first: Sandcastle!

Goal: get practice using collections.

(seem familiar?)

cough cough section 6 problem 7

https://tinyurl.com/namesurferyeah

View these slides!