In Swing, a JFrame is similar to a window in your operating system

- All components will appear inside the JFrame window
  - Buttons, text labels, text fields, etc.
Your GUI program must **inherit** from the JFrame class

- JFrame has **many** methods and attributes that will be available to your program

To use JFrame, you must **import** `javax.swing.JFrame`

We will need several other `javax.swing` classes, you can automatically include them all with **import** `javax.swing.*`
• This class diagram shows only a small subset of the methods that you will gain when you extend JFrame
Before showing your JFrame, you should set some of its properties, at the very least...

- Give the window a size
- Give it a screen location
- Give it a title
- And clean up some of the JFrame annoyances

It is customary to set these properties in the constructor of your program

```java
import javax.swing.*;

public class HelloSwingWorld extends JFrame {
    public HelloSwingWorld () {
        // initialize JFrame here
    }

    public static void main (String[] args) {
        JFrame obj = new HelloSwingWorld();
    }
}
```
Absolute Positioning

Screen \((0,0)\)
Absolute Positioning

Screen $(0, 0)$
Absolute Positioning

Screen (0,0)

Width

Height

$(\text{Width}, \text{Height})$

$X$

$Y$
Absolute Positioning

Screen (0,0)

Frame (0,0)

X

Y

Width

Height

(Width, Height)
Displaying Your JFrame

✔ Give the window a size
✔ Give it a screen location
• Give it a title
• Clean up JFrame annoyances

```java
import javax.swing.*;

public class HelloSwingWorld extends JFrame {
    public HelloSwingWorld () {
        // initialize JFrame here
        setSize (400, 300); // 400 by 300 pixels
        setLocation (100, 100); // 100, 100 from the top left
    }

    public static void main (String[] args) {
        JFrame obj = new HelloSwingWorld();
        // ...
    }
}
```
Displaying Your JFrame

✔ Give the window a size
✔ Give it a screen location
• Give it a title
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}
```
Displaying Your JFrame

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    }

    public static void main (String[] args) {
        JFrame obj = new HelloSwingWorld();
        // ...
    }
}
```
• The title is the text displayed both on the title bar, and on the panel
Displaying Your JFrame

✔ Give the window a size
✔ Give it a screen location
✔ Give it a title
• Clean up JFrame annoyances

```java
import javax.swing.*;

public class HelloSwingWorld extends JFrame {
    public HelloSwingWorld () {
        // initialize JFrame here
        setSize (400, 300); // 400 by 300 pixels
        setLocation (100, 100); // 100, 100 from the top left
        setTitle ("Hello Swing World");
    }

    public static void main (String[] args) {
        JFrame obj = new HelloSwingWorld();
        // ...
    }
}
```
Setting a Layout Manager

- **Use the** `setLayout(LayoutManager)` **method to choose the layout manager**
  - Pass `null` as the argument to disable layout managers
  - `BorderLayout`: pass a `new BorderLayout()` as the argument
  - `GridLayout`: pass a `new GridLayout()` as the argument
  - `FlowLayout`: pass a `new FlowLayout()` as the argument
Displaying Your JFrame

✔ Give the window a size
✔ Give it a screen location
✔ Give it a title
• Clean up JFrame annoyances
  ✔ Disable layout managers

import javax.swing.*;

public class HelloSwingWorld extends JFrame {
    public HelloSwingWorld () {
        // initialize JFrame here
        setSize (400, 300); // 400 by 300 pixels
        setLocation (100, 100); // 100, 100 from the top left
        setTitle ("Hello Swing World");
        setLayout (null);
    }

    public static void main (String[] args) {
        JFrame obj = new HelloSwingWorld();
        // ...
    }
}
Exiting a Swing Program

• Normally, when you want to close a program, you click some type of “x” on the window

• In a JFrame, when you click the “x”, by default it only closes the frame, it does not stop the program
  • We want to change that behavior so that when you close the frame, you also stop the program

![Image of JFrame with x button]

Clicking this should quit the program

Style Requirement:
Change the default close operation
Exiting a Swing Program

- Normally, when you want to close a program, you click some type of "x" on the window

- In a JFrame, when you click the "x", by default, it only closes the frame, it does not stop the program

  - We want to change that behavior so that when you close the frame, you also stop the program

Style Requirement: Change the default close operation

Clicking this should quit the program

GOTCHA
Displaying Your JFrame

- Give the window a size
- Give it a screen location
- Give it a title
- Clean up JFrame annoyances
  - Disable layout managers
  - Change default close operation

```java
import javax.swing.*;

public class HelloSwingWorld extends JFrame {
    public HelloSwingWorld () {
        // initialize JFrame here
        setSize (400, 300); // 400 by 300 pixels
        setLocation (100, 100); // 100, 100 from the top left
        setTitle ("Hello Swing World");
        setLayout (null);
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    }

    public static void main (String[] args) {
        JFrame obj = new HelloSwingWorld();
        // ...
    }
}
```
Displaying Your JFrame

✔ Give the window a size
✔ Give it a screen location
✔ Give it a title
• Clean up JFrame annoyances
  ✔ Disable layout managers
✔ Change default close operation
✔ Disallow resizable frames

```java
import javax.swing.*;

public class HelloSwingWorld extends JFrame {
    public HelloSwingWorld () {
        // initialize JFrame here
        setSize (400, 300); // 400 by 300 pixels
        setLocation (100, 100); // 100, 100 from the top left
        setTitle ("Hello Swing World");
        setLayout (null);
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        setResizable(false);
    }

    public static void main (String[] args) {
        JFrame obj = new HelloSwingWorld();
        // ...
    }
}
```
Displaying Your JFrame

✔ Give the window a size
✔ Give it a screen location
✔ Give it a title
✔ Clean up JFrame annoyances
  ✔ Disable layout managers
✔ Change default close operation
✔ Disallow resizable frames

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    public static void main (String[] args) {
        JFrame obj = new HelloSwingWorld();
        // ...
    }
}
```
Displaying Your JFrame

✔ Give the window a size
✔ Give it a screen location
✔ Give it a title
✔ Clean up JFrame annoyances
  ✓ Disable layout managers
  ✓ Change default close operation
  ✓ Disallow resizable frames
✔ Show the frame!

```java
import javax.swing.*;

public class HelloSwingWorld extends JFrame {
    public HelloSwingWorld () {
        // initialize JFrame here
        setSize (400, 300); // 400 by 300 pixels
        setLocation (100, 100); // 100, 100 from the top left
        setTitle ("Hello Swing World");
        setLayout (null);
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        setResizable(false);
    }

    public static void main (String[] args) {
        JFrame obj = new HelloSwingWorld();
        obj.setVisible(true);
    }
}
```