JFrame

- 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.*

```java
import javax.swing.*;
public class HelloSwingWorld extends JFrame {
    // ...
}
```
• This class diagram shows only a **small** subset of the methods that you will gain when you extend JFrame

```java
public class JFrame {

    // constructor
    public JFrame()
    public JFrame(String title)

    // update
    public void add(JComponent component)
    public void repaint()
    public void setLayout(LayoutManager layout)
    public void setLocation(int x, int y)
    public void setResizable(boolean resizable)
    public void setVisible(boolean visible)
    public void setSize(int width, int height)
    public void setTitle(String title)

    // query
    public int getWidth()
    public int getHeight()
    public int getX()
    public int getY()
}
```
Displaying Your 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)

X

Y

Width

Height

(Width, Height)
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
• Clean up JFrame annoyances

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import javax.swing.*;

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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

```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);
    }

    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.

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.
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.*;

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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}
```
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 {
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        // initialize JFrame here
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        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);
    }
}
```