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# IPM 10/11 – P2

## Introduction to AWT

Licenciatura em Ciência de Computadores

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# Summary

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- The Abstract Window Toolkit (AWT)
- Components
- Containers

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# What is AWT?

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- Stands for 'Abstract Window Toolkit'.
- Appeared in Java's first release in 1995.
- Objective:
  - Provide a toolkit for building user-interfaces.
  - Easy creation of windows and graphics.
  - Platform-independence.
- Currently 'replaced' by Swing.
  - But still nice for learning these concepts...

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# Abstraction layer

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- **Abstraction of the user-interface.**
  - Uses the native interface.
- **Problem (or advantage?).**
  - GUIs look different on different OSs.
  - Swing draws their own components so they look the same in all OSs.
    - ‘Heavier’ layer of abstraction.
    - Swing looks.... ugly! (at least to some people such as this lecturer).

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# Some AWT concepts

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- **Components**
  - Graphical objects with implemented functionalities.
- **Containers**
  - Can hold other components.
- **Layout Managers**
  - Help containers draw their components.
- **Events**
  - Mechanisms for event processing.

# Components

## java.awt.Component

A *component* is an object having a graphical representation that can be displayed on the screen and that can interact with the user. Examples of components are the buttons, checkboxes, and scrollbars of a typical graphical user interface.



<http://java.sun.com/j2se/1.4.2/docs/api/java/awt/Component.html>

[Image adapted from Wikipedia]

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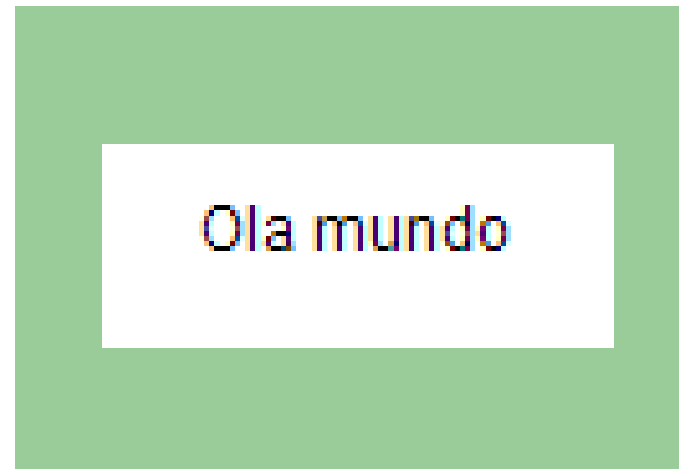
# Components: Label

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- Provides a way to show written text.
- Properties:
  - Text
  - Alignment.

- **Sample:**

```
label = new Label();  
label.setText("Ola mundo");  
label.setAlignment(Label.CENTER);
```



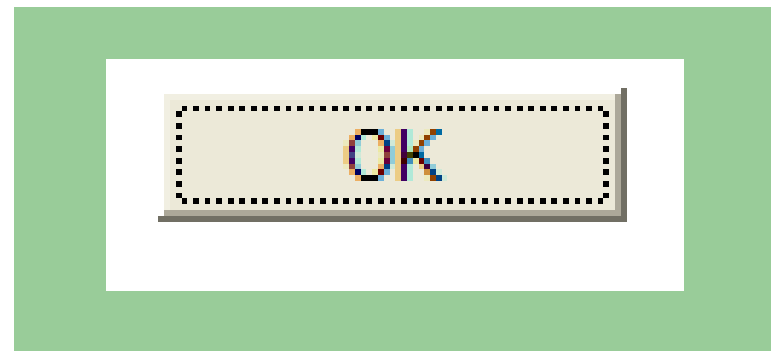
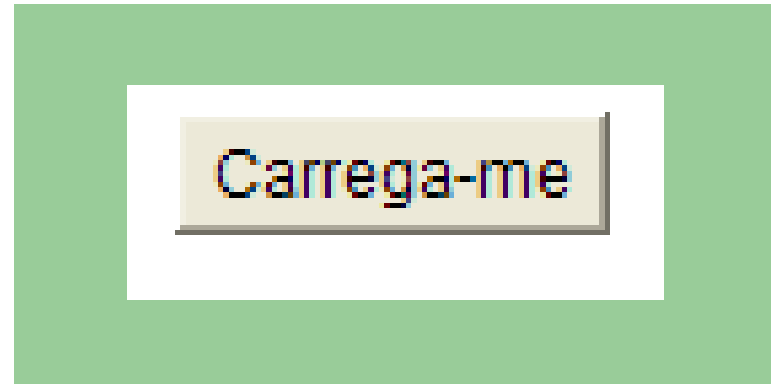
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# Components: Button

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- Easy way to send 'action' commands (*events*)
- Properties:
  - Label
  - ActionCommand
- **Sample:**

```
button = new Button();  
button.setLabel("Carrega-me");
```



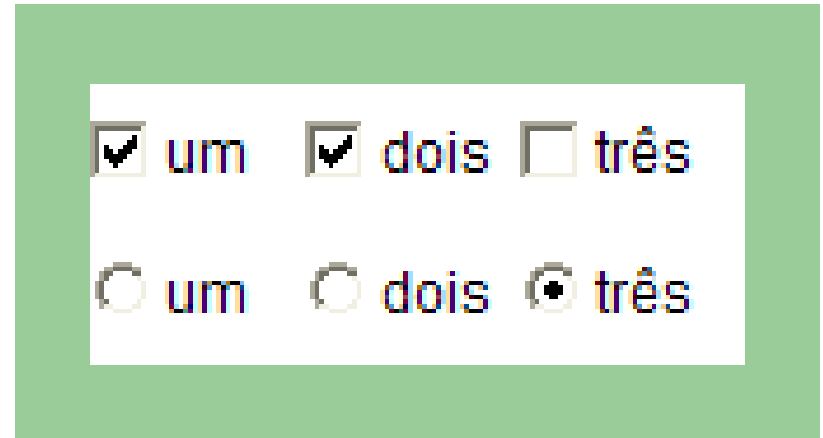


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# Component: CheckBox

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- Implements a *Boolean* decision.
- Implements a choice amongst a group of options.
- Properties
  - Label
  - State
  - CheckboxGroup

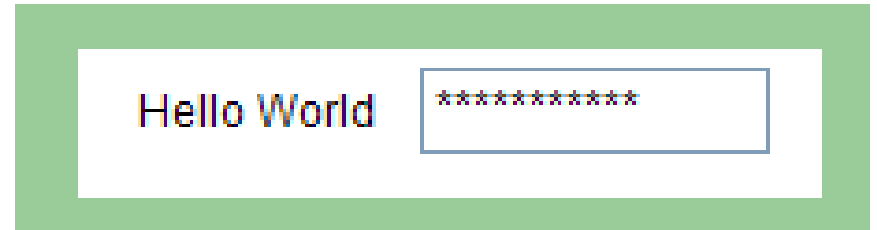


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# Components: TextComponent

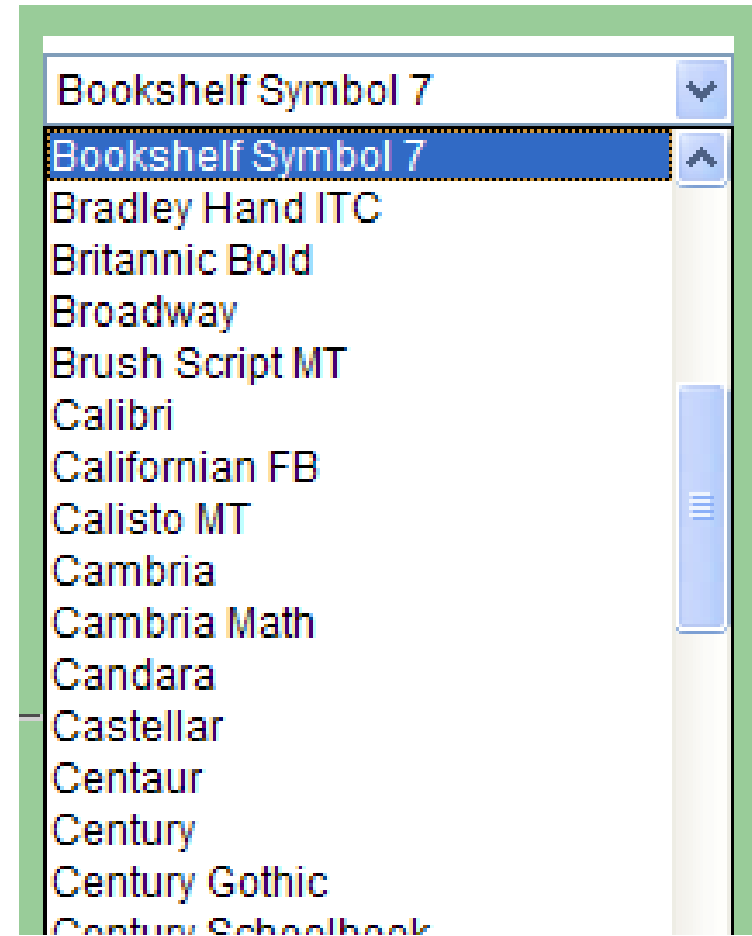
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- Allows text input.
- Two options:
  - TextField (one line)
  - TextArea (multi-line)
- Properties:
  - CaretPosition
  - Columns
  - Text
  - SelectionText



# Components: Choice

- Allows the selection of one amongst several options (*combobox*).
- Methods
  - Add
  - Select
  - Remove

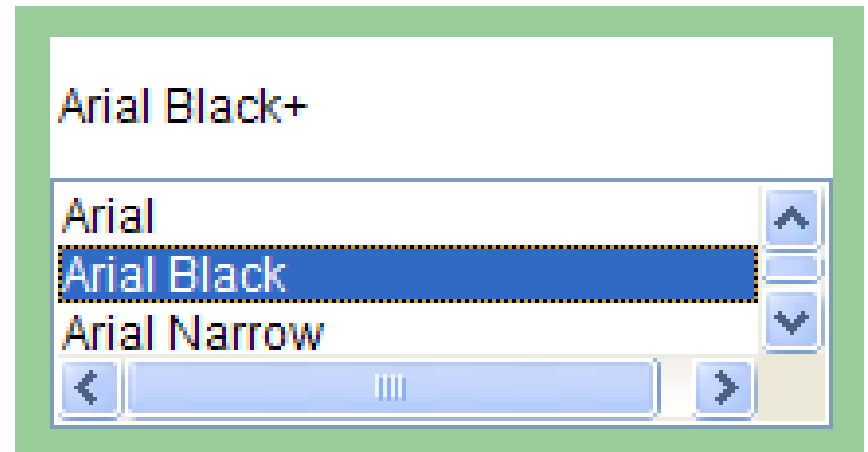


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# Components: List

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- Allows single or multiple selection of options from a list.
- Properties
  - MultipleMode
- Methods
  - Add
  - Select
  - Remove
  - MakeVisible



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# Containers

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- **java.awt.Container**

A generic Abstract Window Toolkit(AWT) container object is a **component** that can **contain other AWT components**.

- We can have containers inside containers.
- Helps us create adaptable interfaces.
- Uses LayoutManagers

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# Types of containers

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- **Applet**
  - Top container for embedded graphical applications.
- **Panel**
  - Groups objects in an inner window.
- **Frame**
  - Groups objects in a top window.
- **Window**
  - Top borderless window.
- **Other**
  - ScrollPane
  - Dialog

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# Resources

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1. Developer Resources for Java Technology

<http://java.sun.com/>

2. Essentials of the Java programming language

<http://java.sun.com/developer/onlineTraining/Programming/BasicJava1/>