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# IPM 10/11 – P3

## Layout Managers

Licenciatura em Ciência de Computadores

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# Summary

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- Containers and Layout Managers

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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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# Layout Managers

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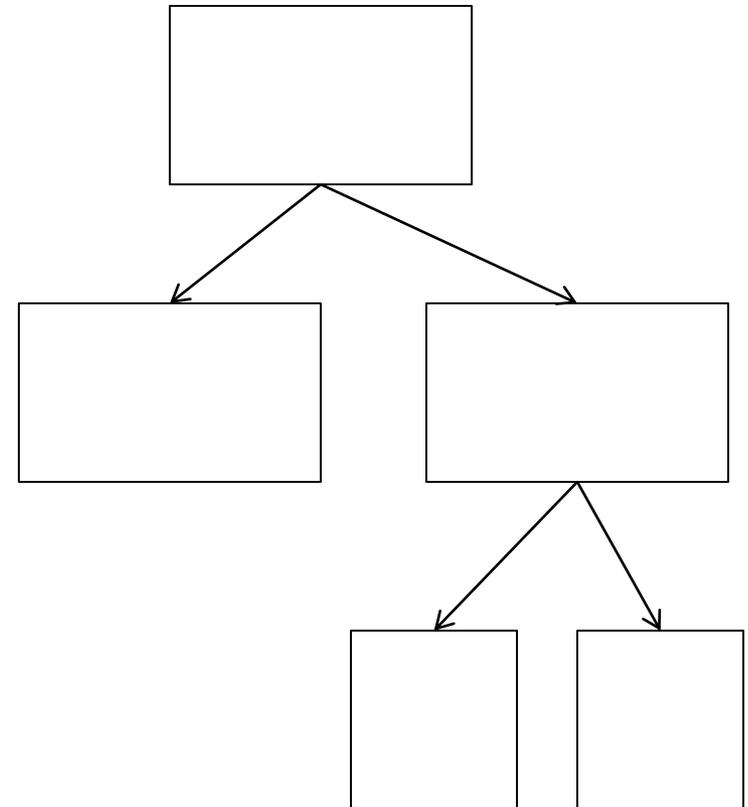
- Defines an interface for classes that know how to lay out **Containers**.
- Examples:
  - FlowLayout
  - BorderLayout
  - CardLayout
  - GridLayout
  - GridBagLayout

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# Positioning

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- Hierarquical
  - Multi-level.
  - *Master* and *Slave* components.
  - Bottom-up evaluation.
  - Dimensions according to **child** dimensions.
  - Positions according to **brother** positions.



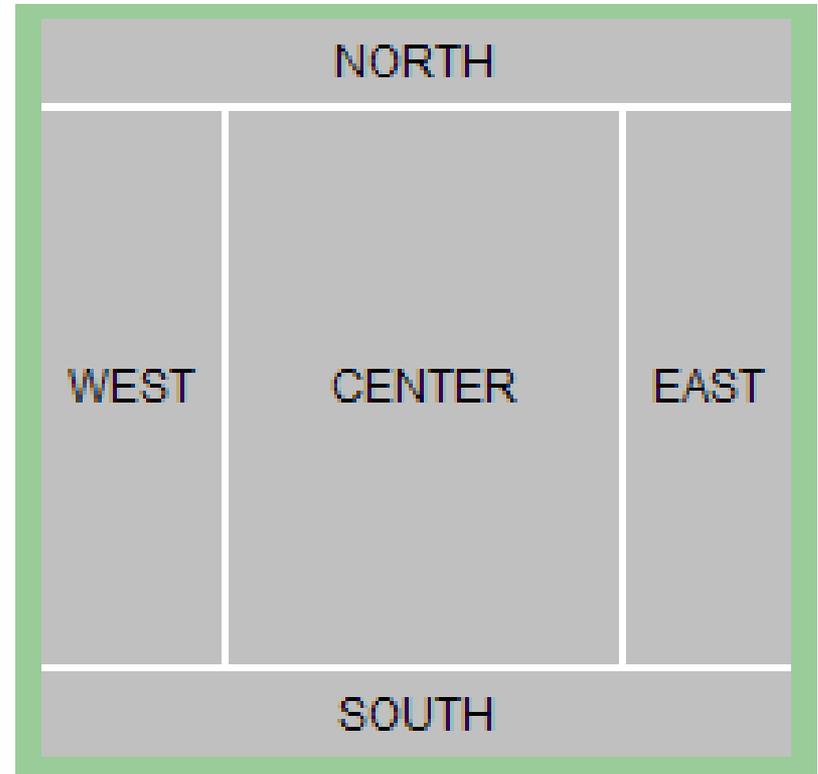
# LM: BorderLayout

- **Strategy**

- Divide the container in 5 areas: north, south, east, west, center.
- Associate a component to the center area.
- Associate a position to all the other ones.

- **Notes**

- Works well for a small number of components.
- Explores spatial relationships between components.
- Not all positions need to be filled.



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# LM: GridLayout

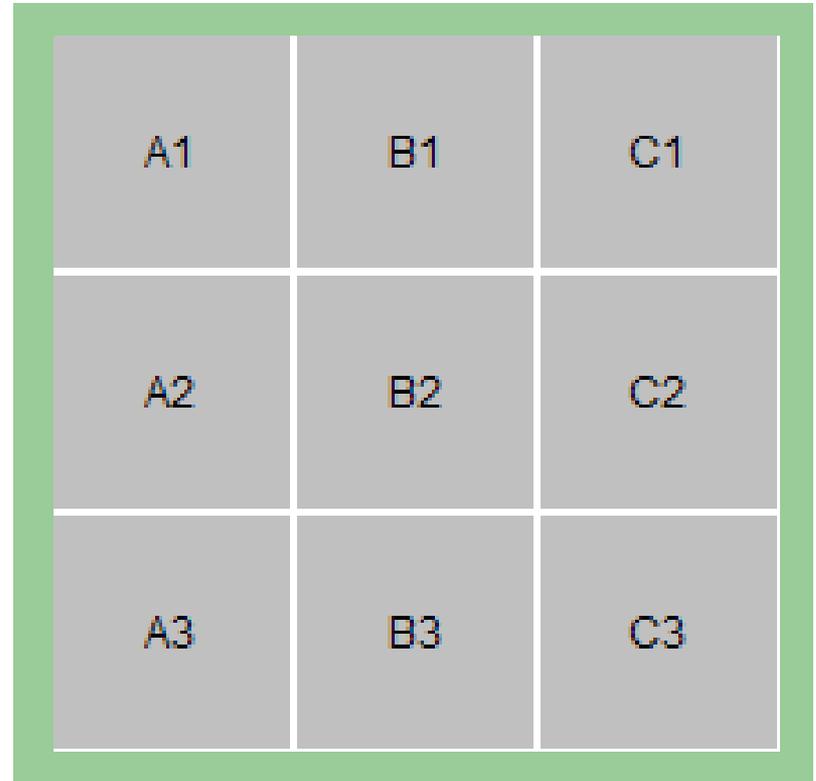
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- **Strategy**

- Divide the container in lines and columns.
- Place components sequentially on each cell.

- **Notes**

- Can work with a large number of components.
- Very simple organization.
- Can't have empty slots.

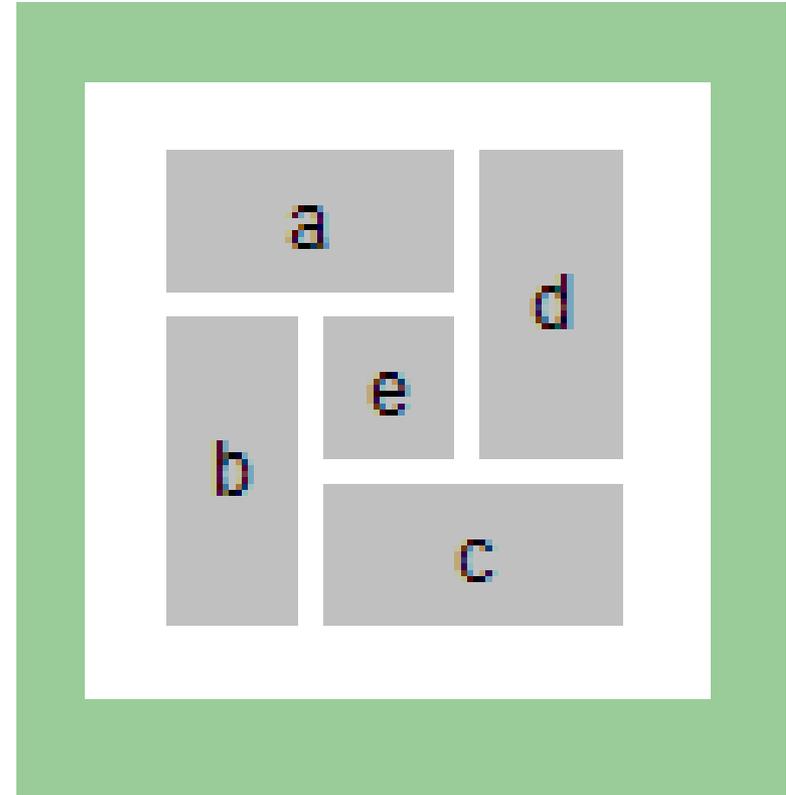


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# LM: GridBagLayout

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- **Strategy**
  - Divide the container in lines and columns.
  - Apply restrictions to containers.
- **Notes**
  - Can work with a large number of components.
  - High degree of control over grid positioning.
  - More complex to use.



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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/>