

# IPM 13/14 – P3

## Layout Managers

Licenciatura em Ciência de Computadores

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# Summary

- Containers and Layout Managers

# Containers

- **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

# Types of containers

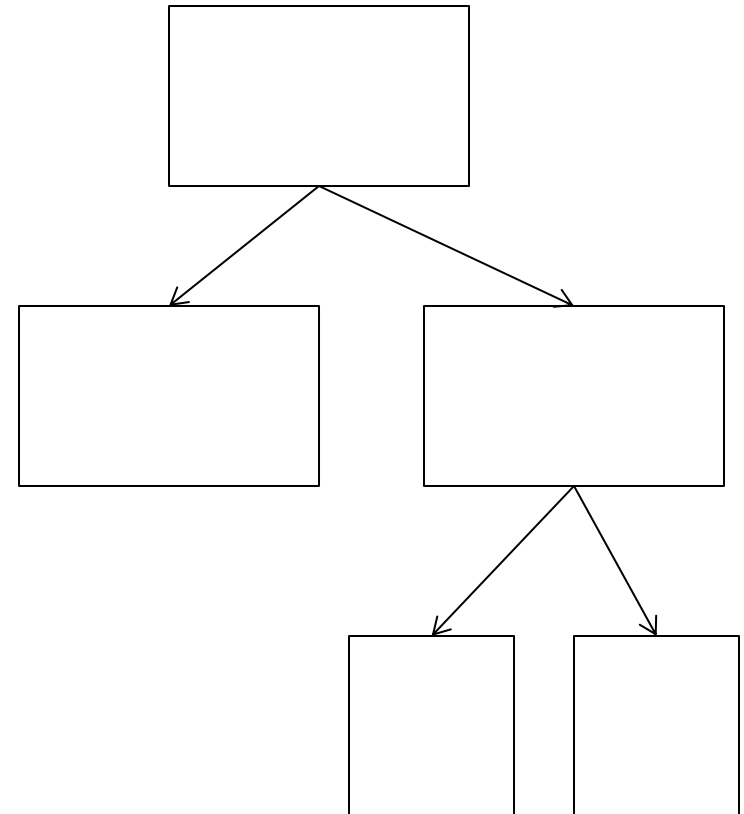
- **Applet**
  - Top container for embedded graphical applications.
- **Panel**
  - Groups objects in an inner window.
- **Frame**
  - Groups objects in a top window.
- **Window**
  - Top borderless window.
- **Other**
  - ScrollPane
  - Dialog

# Layout Managers

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

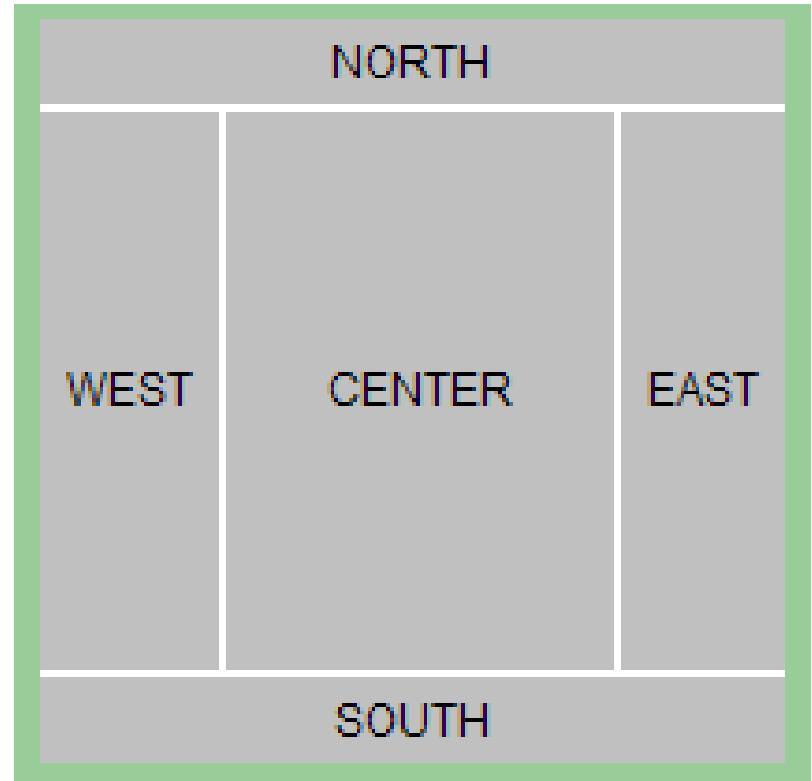
# Positioning

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



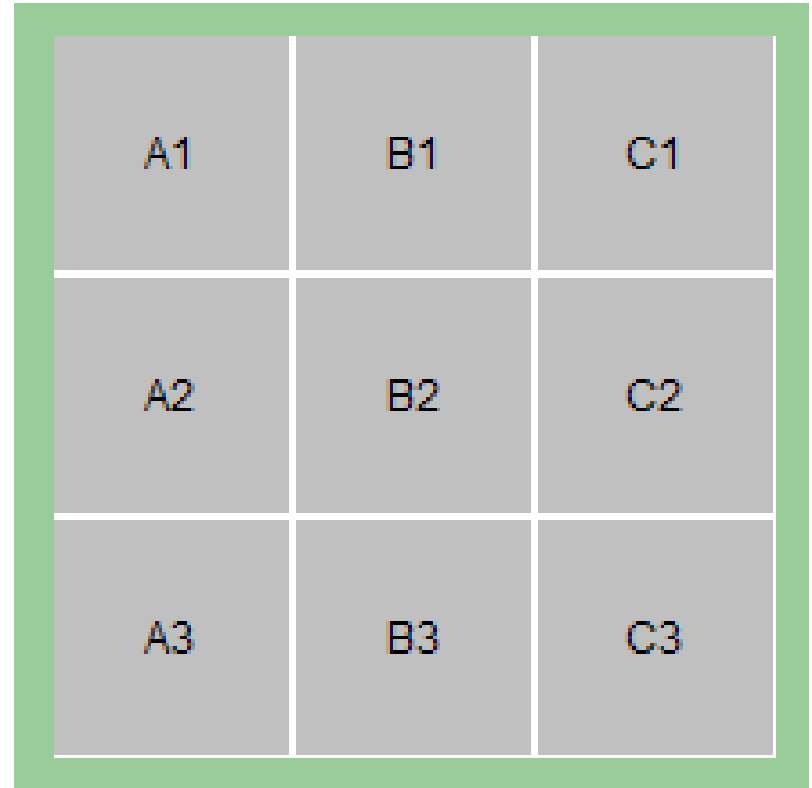
# LM: BorderLayout

- **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.



# LM: GridLayout

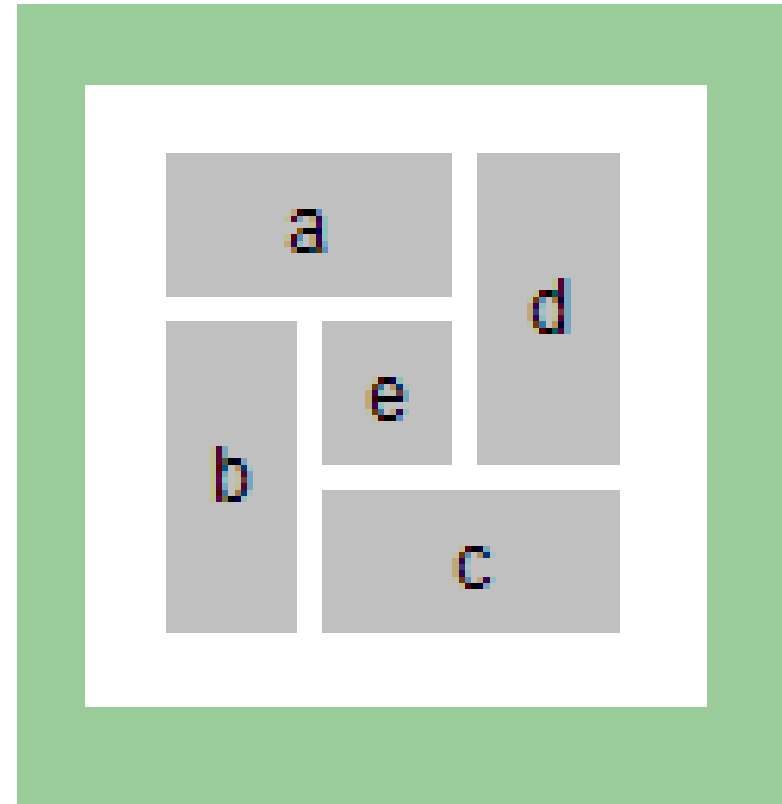
- **Strategy**
  - Divide the container in lines and columns.
  - Place components sequentially on each cell.
- **Notes**
  - Can work with a large number of components.
  - Very simple organization.
  - Can't have empty slots.





# LM: GridBagLayout

- **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.



# Resources

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/>