Osnovi softverskog inženjerstva

P-06: Dijagram aktivnosti

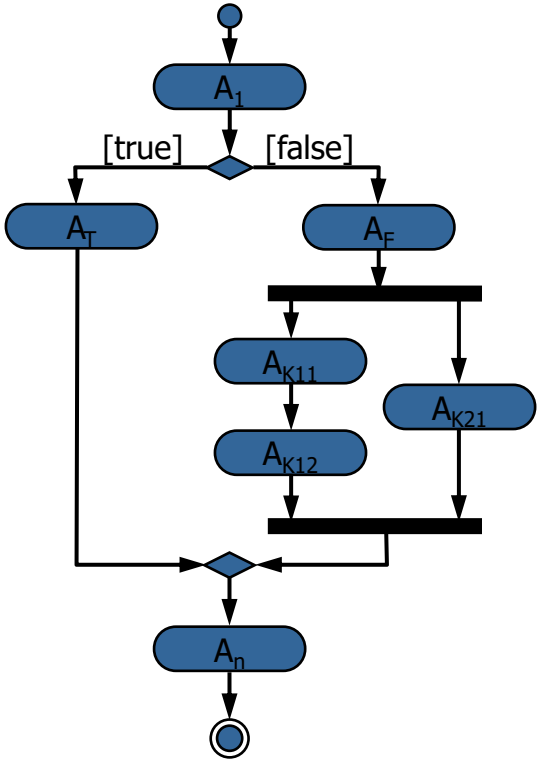
2024

Dijagram aktivnosti (Activity Diagram)

- **Activity Diagrams are typically used to illustrate the flow of control in a system and refer to the steps involved in the execution of a use case**
- The Activity Diagram combines ideas from several techniques:
  - event diagrams of Jim Odell,
  - SDL state modeling techniques,
  - workflow modeling, and
  - Petri nets
- **Activity Diagrams are used in business and process modeling where their primary use is to depict the dynamic aspects of a system**
- Activity Diagrams allow for **modeling of sequential and concurrent activities**
- Activity Diagrams allow for **modeling control flow and object flows**

- An activity diagram depicts the control flow from a start point to a finish point showing the various decision paths that exist while the activity is being executed

Example of a control flow



Notacija dijagrama aktivnosti

- **Initial State** – The starting state before an activity takes place is depicted using the initial state

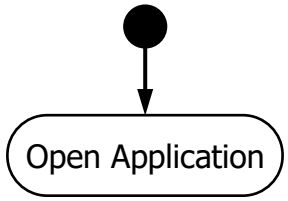
- We use a black filled circle to depict the initial state of a system.
- A process can have only one initial state unless we are depicting nested activities.

- **Action Flow or Control flows –** Action flows or Control flows are also referred to as paths and edges.
- They are used to show the transition from one activity state to another

- **Action or Activity State** – An activity represents execution of an action on objects or by objects.

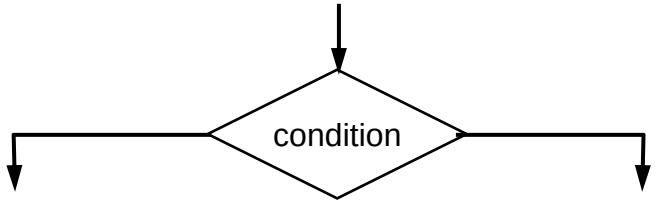
- We represent an activity using a rectangle with rounded corners. Basically any action or event that takes place is represented using an activity.

- Example – The initial state is the state of the system before the application is opened.

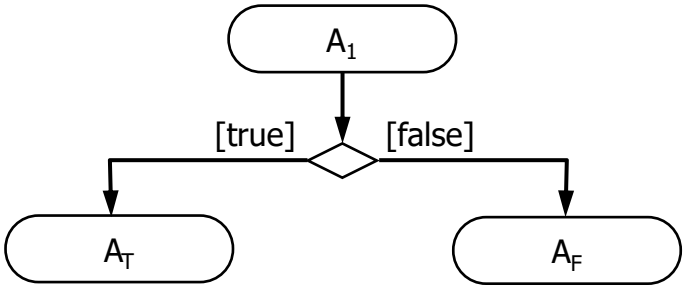


Notacija dijagrama aktivnosti

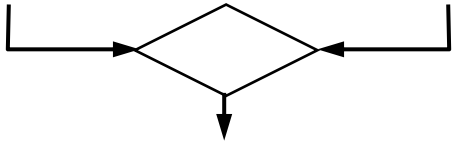
- **Decision node and Branching –** When we need to make a decision before deciding the flow of control, we use the decision node.



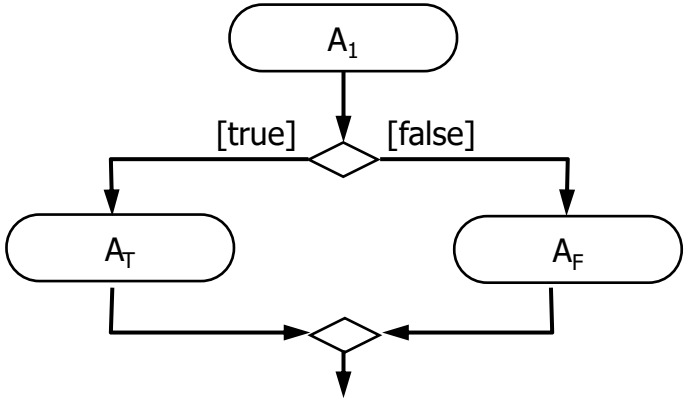
- The outgoing arrows from the decision node can be labeled with conditions or guard expressions. It always includes two or more output arrows.



- **Merge or Merge Event –** Scenarios arise when activities which are not being executed concurrently have to be merged.

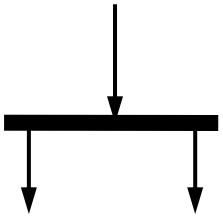


- We can merge two or more activities into one if the control proceeds onto the next activity irrespective of the path chosen



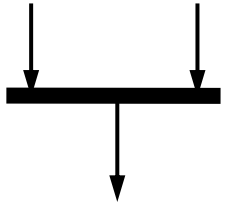
Notacija dijagrama aktivnosti

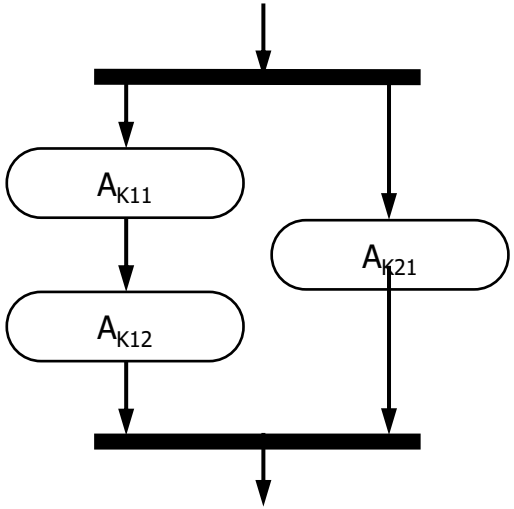
- **Fork –** Fork nodes are used to support concurrent activities.
- For fork notations we use a solid rectangular bar with incoming arrow from the parent activity state and outgoing arrows towards the subsequent activities.



- **We use a fork node when both the activities get executed concurrently i.e. no decision is made before splitting the activity into two parts. Both parts need to be executed in case of a fork statement.**

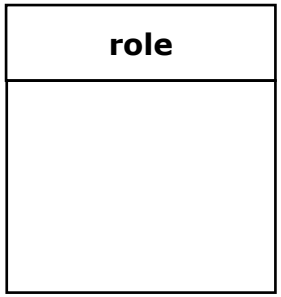
- **Join –** Join nodes are used to support concurrent activities converging into one.
- For join notations we have two or more incoming edges and one outgoing edge.

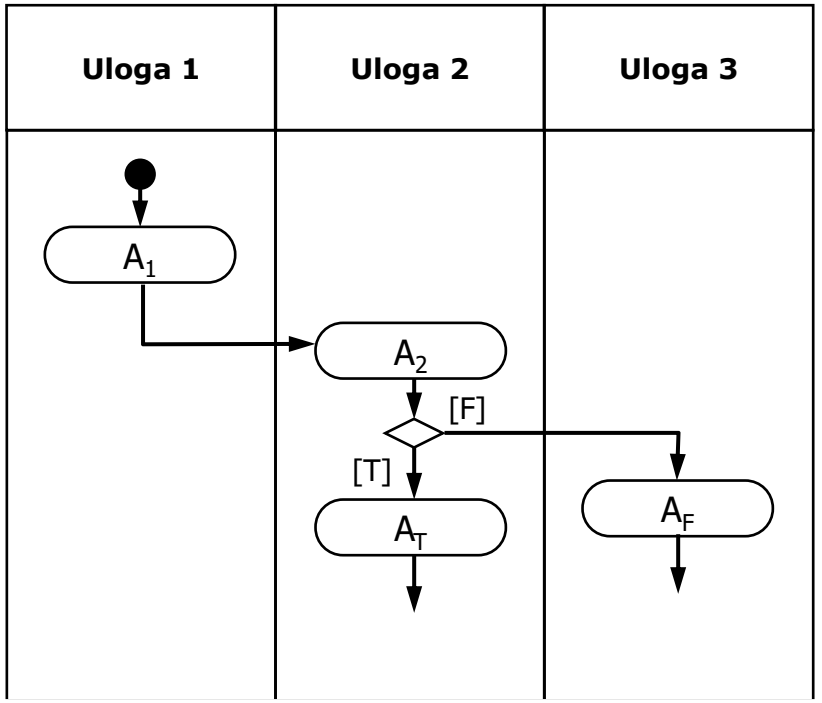




Notacija dijagrama aktivnosti

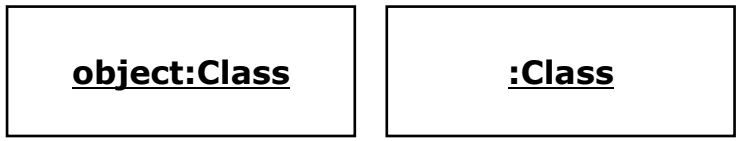
- **Swimlanes –** We use swimlanes for grouping related activities in one column.
- Swimlanes group related activities into one column or one row.
- Swimlanes can be vertical and horizontal.
- Swimlanes are used to add modularity to the activity diagram.
- It is not mandatory to use swimlanes.
- They usually give more clarity to the activity diagram.
- We use a rectangular column to represent a swimlane.



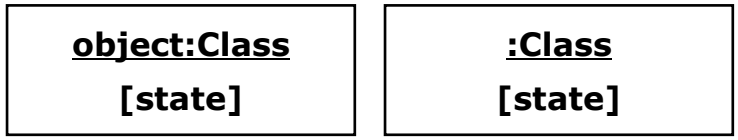


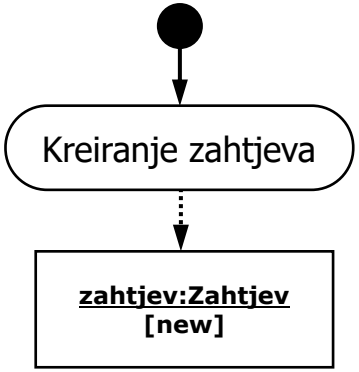
Notacija dijagrama aktivnosti

- **Object node** – A node representing an object used or created by some action.
- An object is a named/unnamed instance of some class

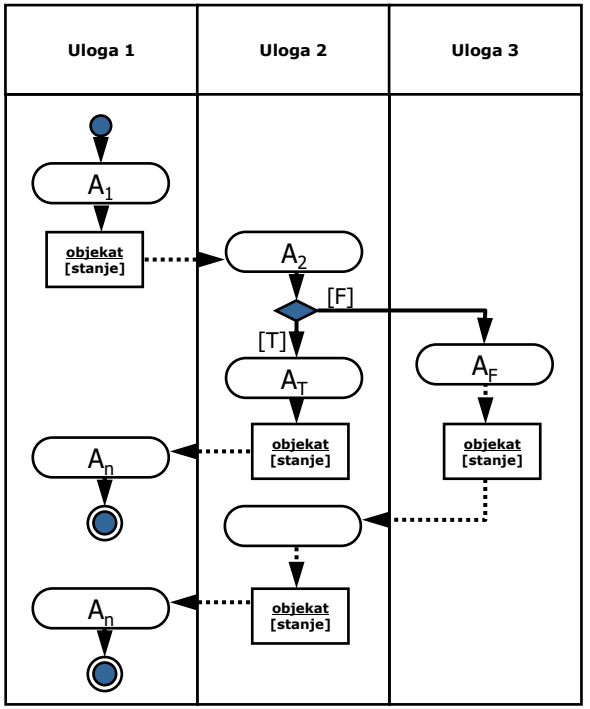


- An may be in some state

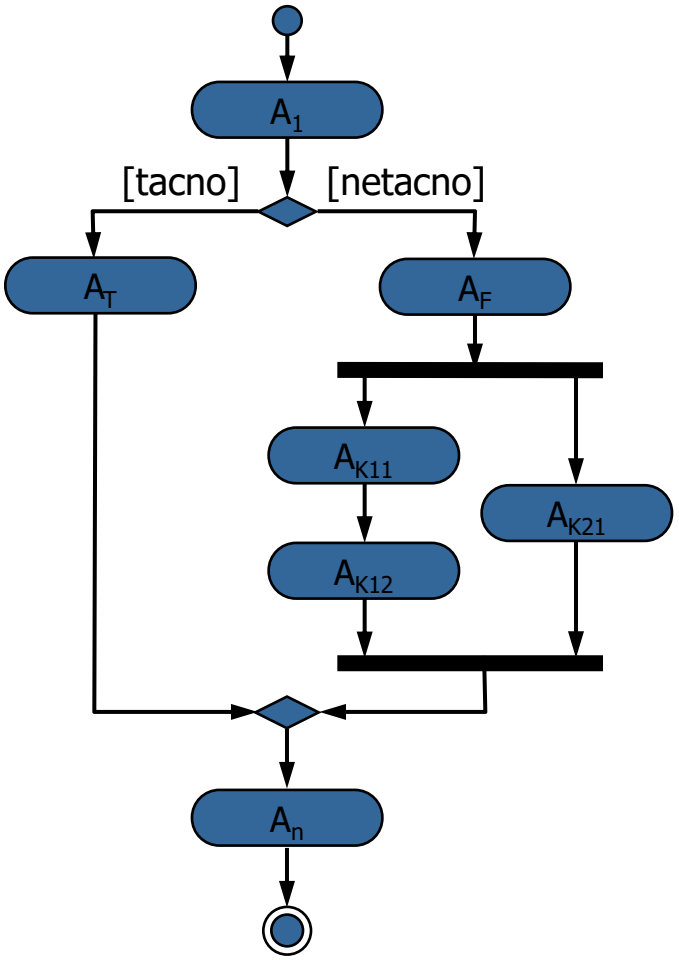




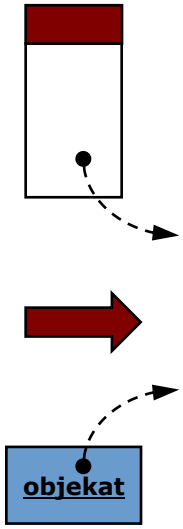
- **Final State or End State** – The state which the system reaches when a particular process or activity ends.
- We use a filled circle within a circle (bull eye).
- A system or a process can have multiple final states.



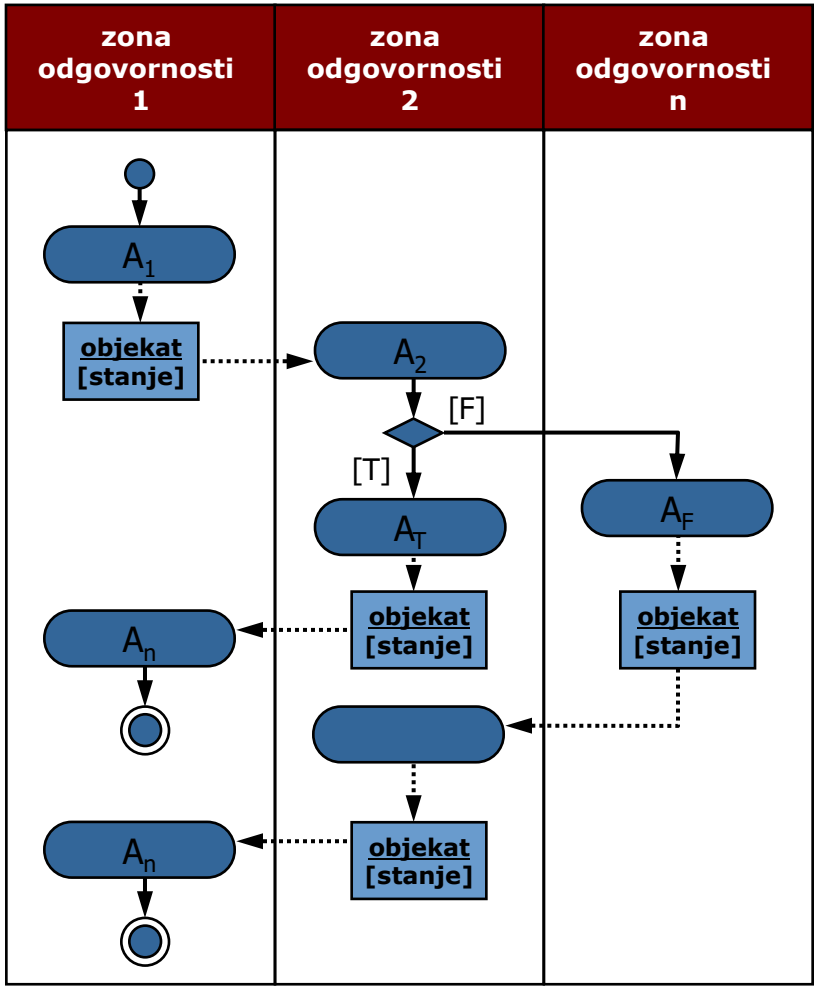
Notacija dijagrama aktivnosti



Dijagram aktivnosti

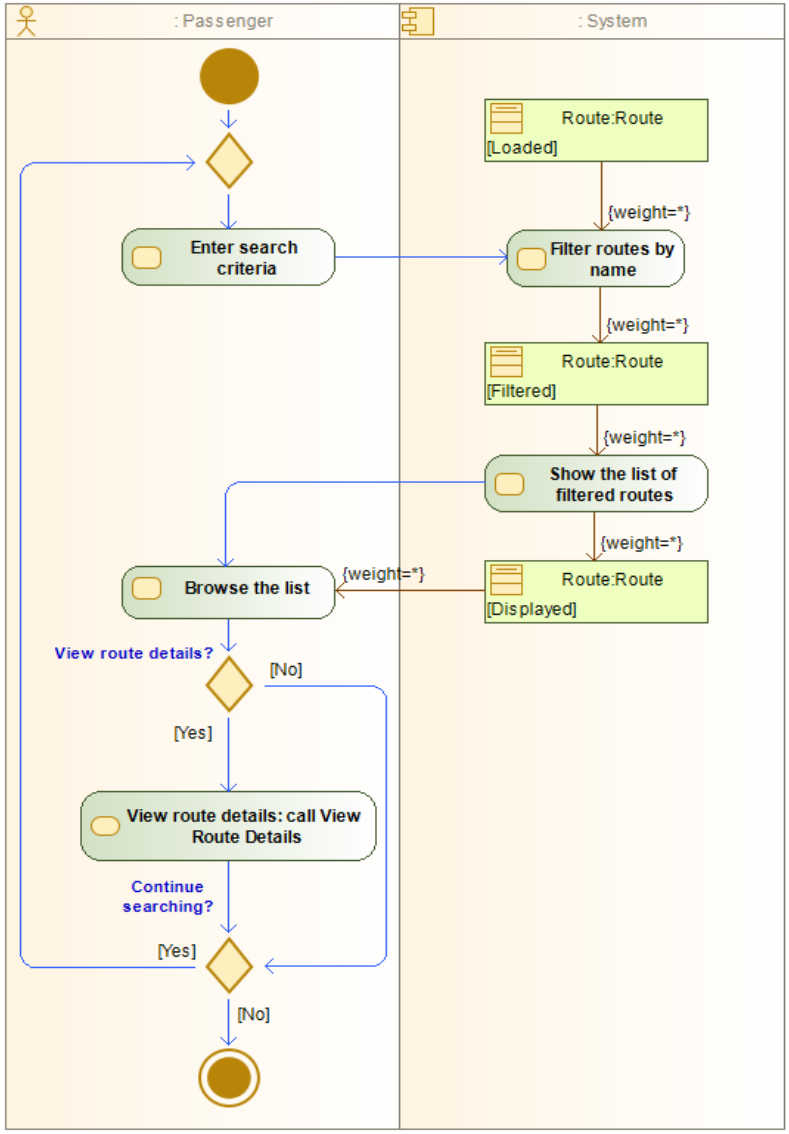


Detaljni dijagram aktivnosti



Primjer dijagrama aktivnosti (BL BusTracker)

Search Routes



Start Navigation to Bus Stop