ACTIVITY DIAGRAM

Dr. Dharmendra Singh Rajput
Associate Professor
SITE

Introduction

- Activity diagram is another important diagram in UML.
- Activity diagram describe dynamic aspects of the system.
- Activity diagram is basically a flow chart to represent the flow form one activity to another activity.
- The activity can be described as an operation of the system.

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- The control flow is drawn from one operation to another.
- This flow can be sequential, branched or concurrent.
- Activity diagrams deals with all type of flow control by using different elements like fork, join etc.

Purposes of Activity diagram:

- Draw the activity flow of a system.
- Describe the sequence from one activity to another.
- Describe the parallel, branched and concurrent flow of the system.
- Activity diagram is used to show message flow from one activity to another.

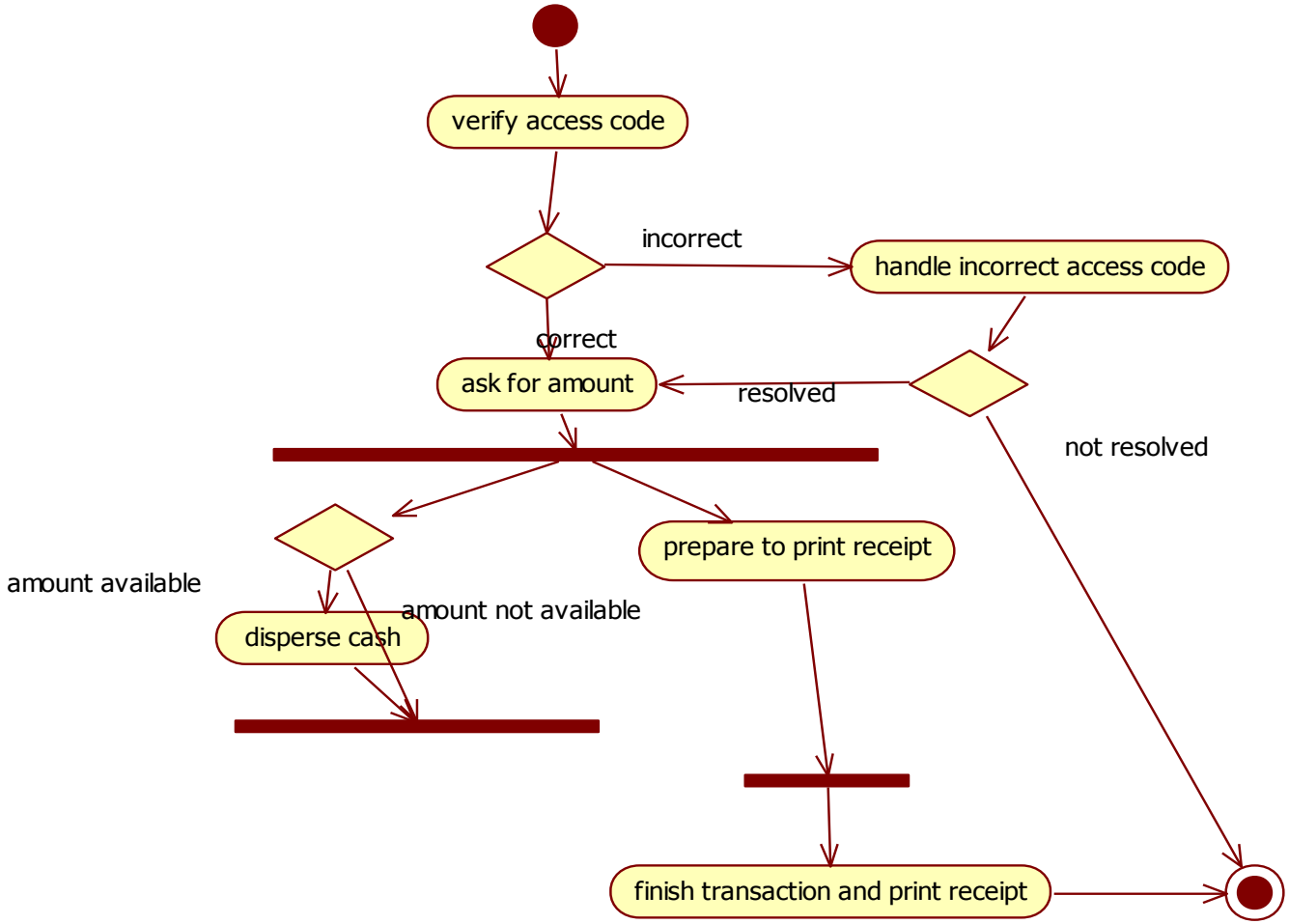
What is Activity

- Activity is a particular operation of the system.
- An activity is a function performed by the system.
- The only missing thing in activity diagram is the message part.
- It does not show any message flow from one activity to another.

Contd…

- Activity diagram is some time considered as the flow chart.
- Although the diagrams looks like a flow chart but it is not.
- It shows different flow like parallel, branched, concurrent and single.

Example


verify access code
incorrect
handle incorrect access code
correct
ask for amount
resolved
not resolved
amount available
amount not available
disperse cash
prepare to print receipt
finish transaction and print receipt

How to draw Activity Diagram?

- Before drawing an activity diagram we must have a clear understanding about the elements used in activity diagram.
- The main element of an activity diagram is the activity itself.
- After identifying the activities we need to understand how they are associated with constraints and conditions.

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- So before drawing an activity diagram we should identify the following elements:
  - Activities
  - Association
  - Conditions
  - Constraints

  Once the above mentioned parameters are identified we need to make a mental layout of the entire flow. This mental layout is then transformed into an activity diagram.

Order Management System

- In the diagram four activities are identified which are associated with conditions.
  - One important point should be clearly understood that an activity diagram cannot be exactly matched with the code.
- The activity diagram is made to understand the flow of activities and mainly used by the business users.

Contd..

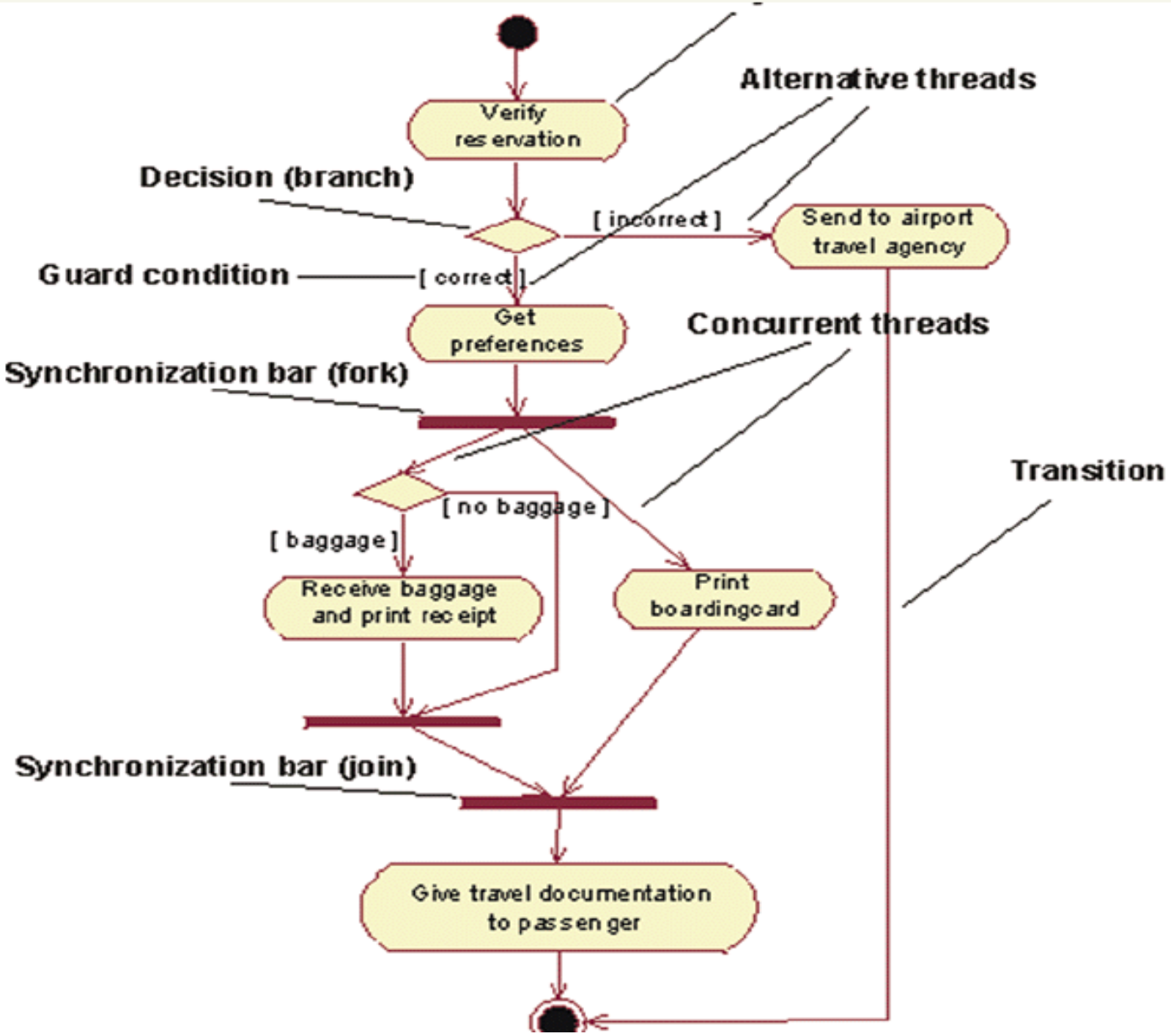
- The following diagram is drawn with the four main activities:
  - Send order by the customer
  - Receipt of the order
  - Confirm order
  - Dispatch order
- After receiving the order request condition checks are performed to check if it is normal or special order.
- After the type of order is identified dispatch activity is performed and that is marked as the termination of the process.

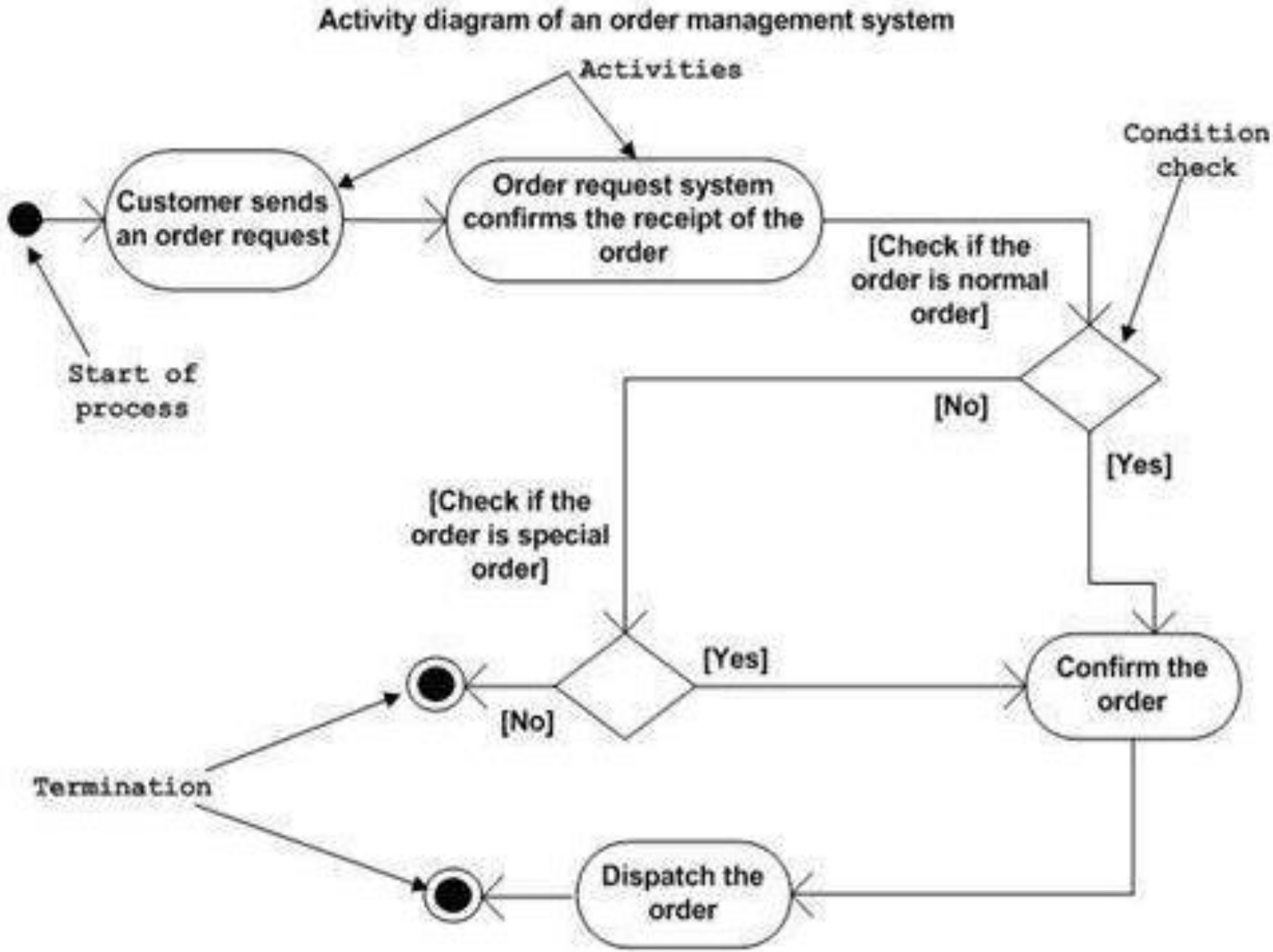
Activity Diagram Basic Notations:

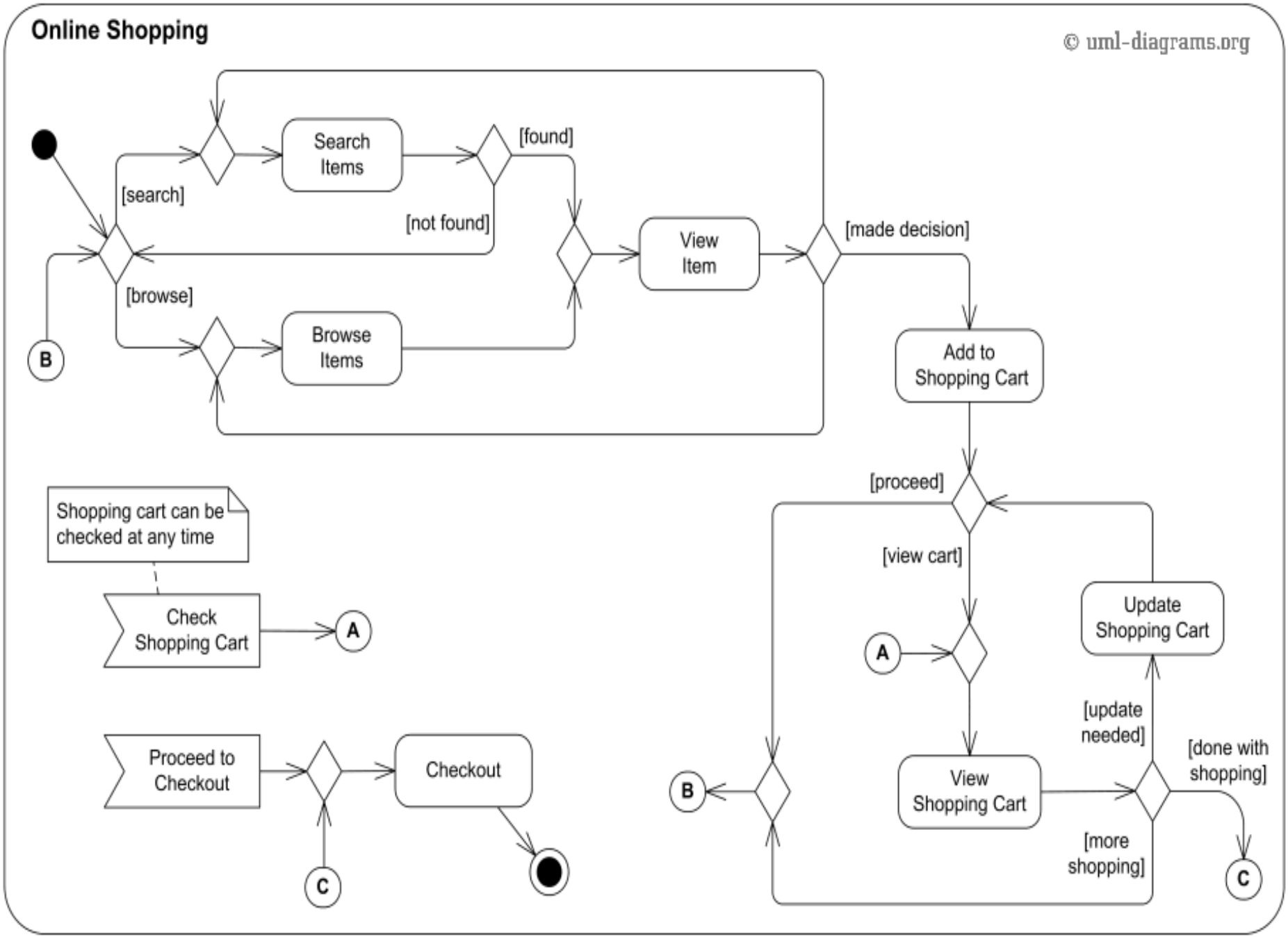
- **Initial node:** represented by a closed -filled in- circle, used to represent the start of reading of the diagram.
- **final node:** represents the end point of activity diagram and represented by the filled circle with a border.
- **Activity:** represented by a rounded rectangular, and it represents the activities that occur.
- **Flow:** represented by the arrows in the following figure.
- **Fork:** represented by a bar with one input flow and multiple output.
- **Join:** as in fork represented by a bar but with multiple input and one output.

Contd…

- **Condition:** a condition written on the flow, which must evaluate to true to continue to the next.
- **Decision:** represented by a diamond with one flow entering and several leaving.
- **Merge:** represented by a diamond with several flows entering and one leaving. one or more incoming flows must reach to continue processing.
- **Partition:** called swimlanes, indicating who/what is performing the activities (either the *Applicant*, *Registrar*, or *System*).
- **Sub-activity indicator:** The rake in the bottom corner of an activity, indicates that the activity is described by a more finely detailed activity diagram


Alternative threads
Verify reservation
Decision (branch)
[incorrect]
Send to airport travel agency
Guard condition
[correct]
Get preferences
Concurrent threads
Synchronization bar (fork)
Transition
[no baggage]
[baggage]
Receive baggage and print receipt
Print boardingcard
Synchronization bar (join)
Give travel documentation to passenger


Activity diagram of an order management system
Activities
Condition check
Customer sends an order request
Order request system confirms the receipt of the order
[Check if the order is normal order]
Start of process
[No]
[Yes]
[Check if the order is special order]
[Yes]
[No]
Confirm the order
Termination
Dispatch the order


Online Shopping
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Search Items
[found]
[search]
[not found]
View Item
[made decision]
[browse]
Browse Items
B
Add to Shopping Cart
[proceed]
Shopping cart can be checked at any time
[view cart]
Update Shopping Cart
Check Shopping Cart
A
A
[update needed]
[done with shopping]
B
View Shopping Cart
Proceed to Checkout
Checkout
[more shopping]
C
C

Usages of Activity Diagram

- Following are the main usages of activity diagram:
  - Modeling work flow by using activities.
  - Modeling business requirements.
  - High level understanding of the system's functionalities.
  - Investigate business requirements at a later stage.