ACTIVITY DIAGRAMS

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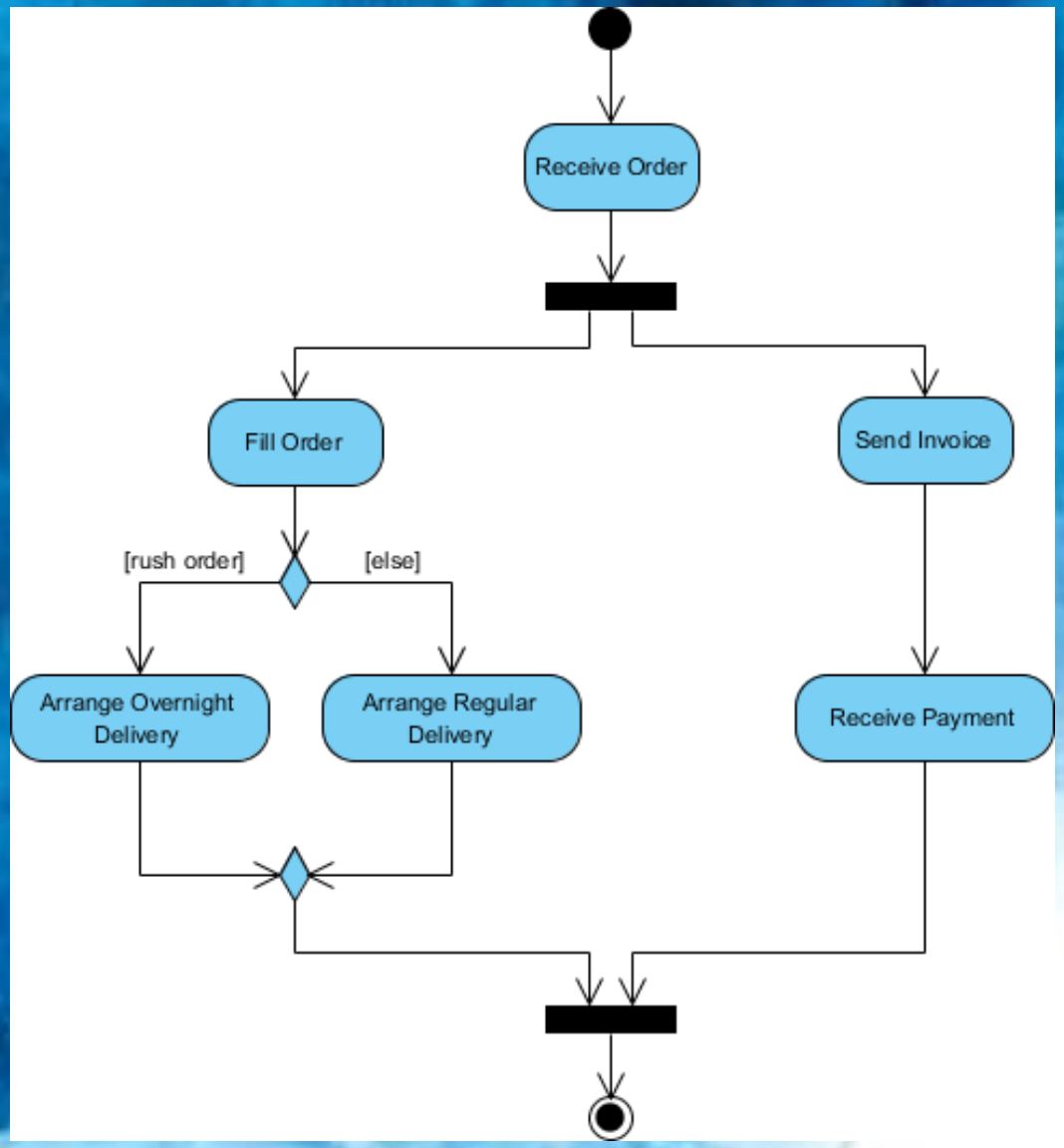


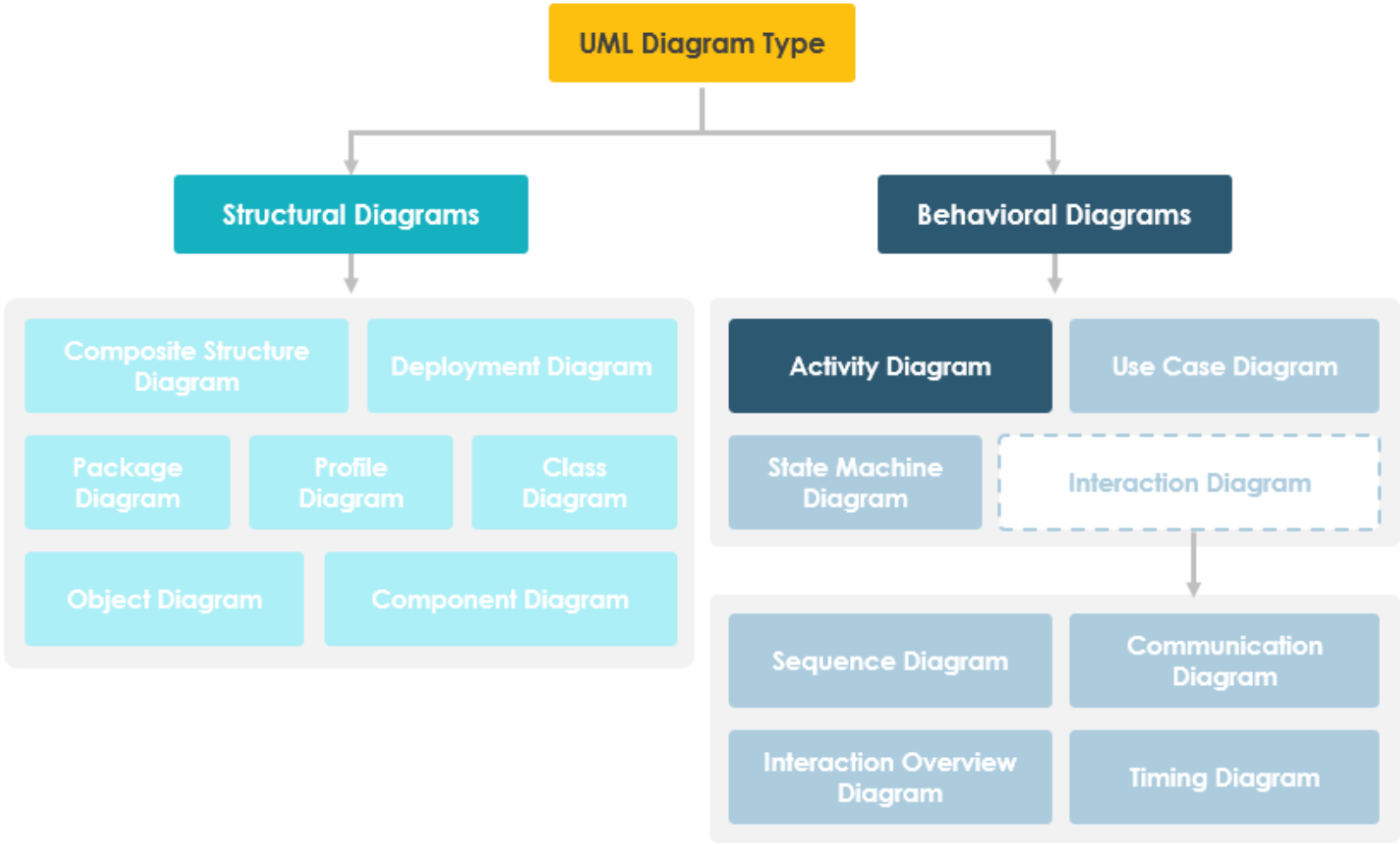
WHAT IS AN ACTIVITY DIAGRAM?

- A type of behavioral diagram in UML.
- Describes the dynamic aspects of a system.
- Models flow from one activity to another.
- Think of it as an advanced version of a flowchart.

ACTIVITY DIAGRAM IN UML HIERARCHY

Part of the behavioral diagrams family in UML.

Complements use case and sequence diagrams.



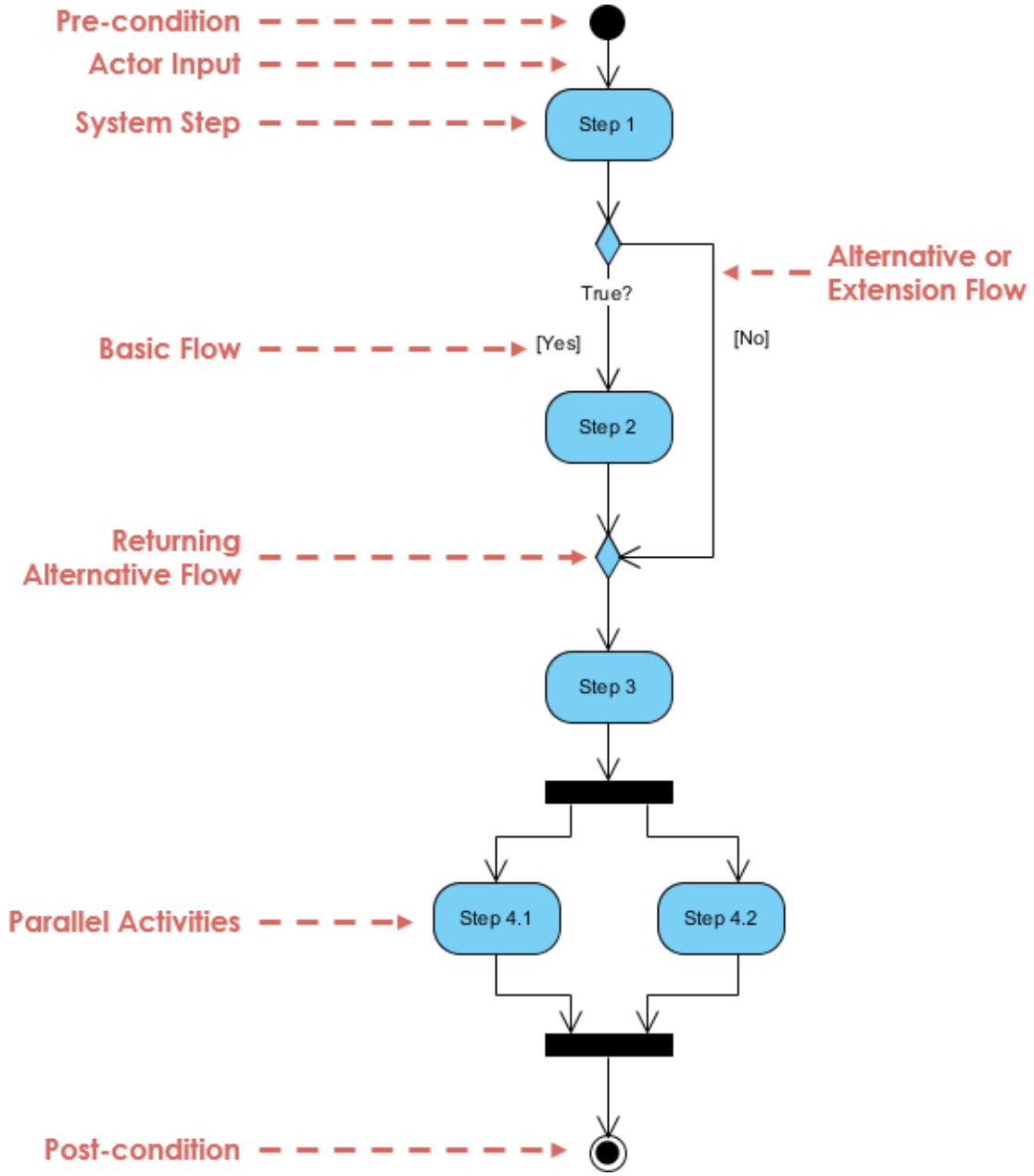
WHEN TO USE ACTIVITY DIAGRAMS

- Identify candidate use cases, through the examination of business workflows
- Identify pre- and post-conditions (the context) for use cases
- Model workflows between/within use cases
- Model complex workflows in operations on objects
- Model in detail complex activities in a high level activity Diagram

BENEFITS OF ACTIVITY DIAGRAMS

- Helps visualize workflow of a system.
- Clarifies responsibilities and sequence of operations.
- Suitable for both system-level and business process modeling.

A BASIC ACTIVITY DIAGRAM - FLOWCHART LIKE



LEARN BY EXAMPLES – OVERVIEW

We will look at several practical examples:

- Word Processor Workflow
- Order Processing
- Student Enrollment
- Swimlane Diagrams

ACTIVITY DIAGRAM - MODELING A WORD PROCESSOR

The activity diagram example below describes the workflow for a word process to create a document through the following steps:

Open the word processing package.

Create a file.

Save the file under a unique name within its directory.

Type the document.

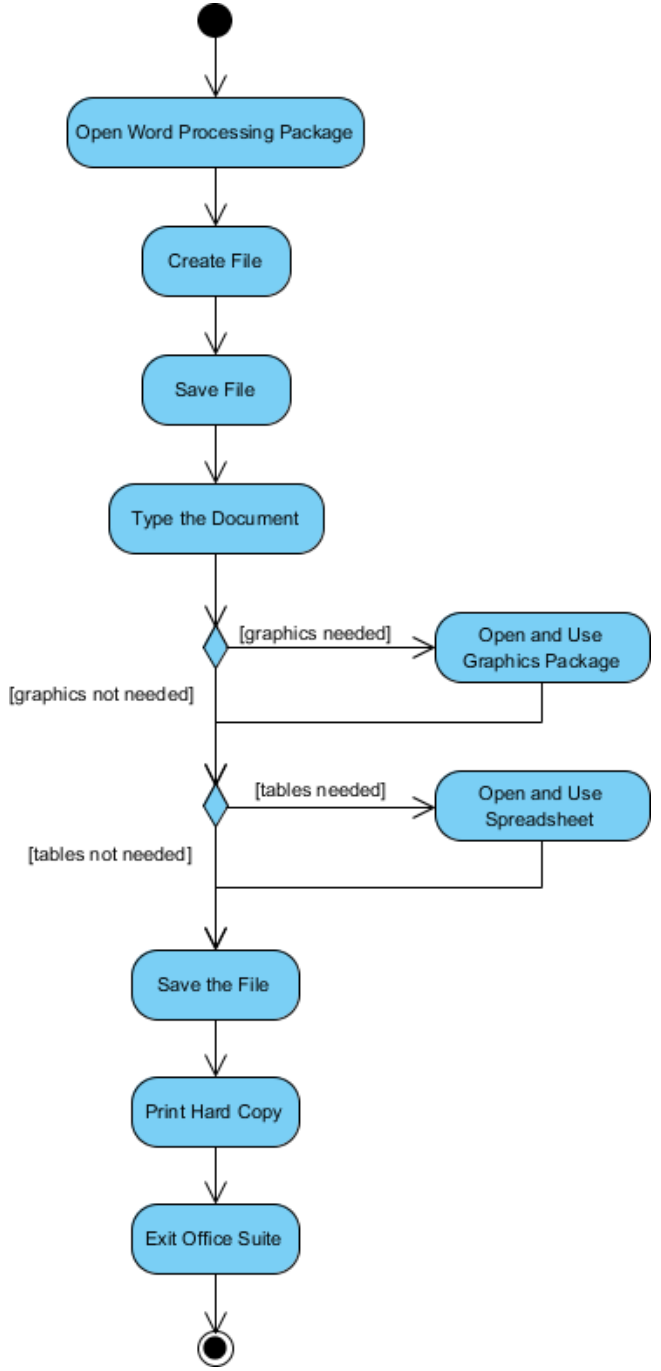
If graphics are necessary, open the graphics package, create the graphics, and paste the graphics into the document.

If a spreadsheet is necessary, open the spreadsheet package, create the spreadsheet, and paste the spreadsheet into the document.

Save the file.

Print a hard copy of the document.

Exit the word processing package.



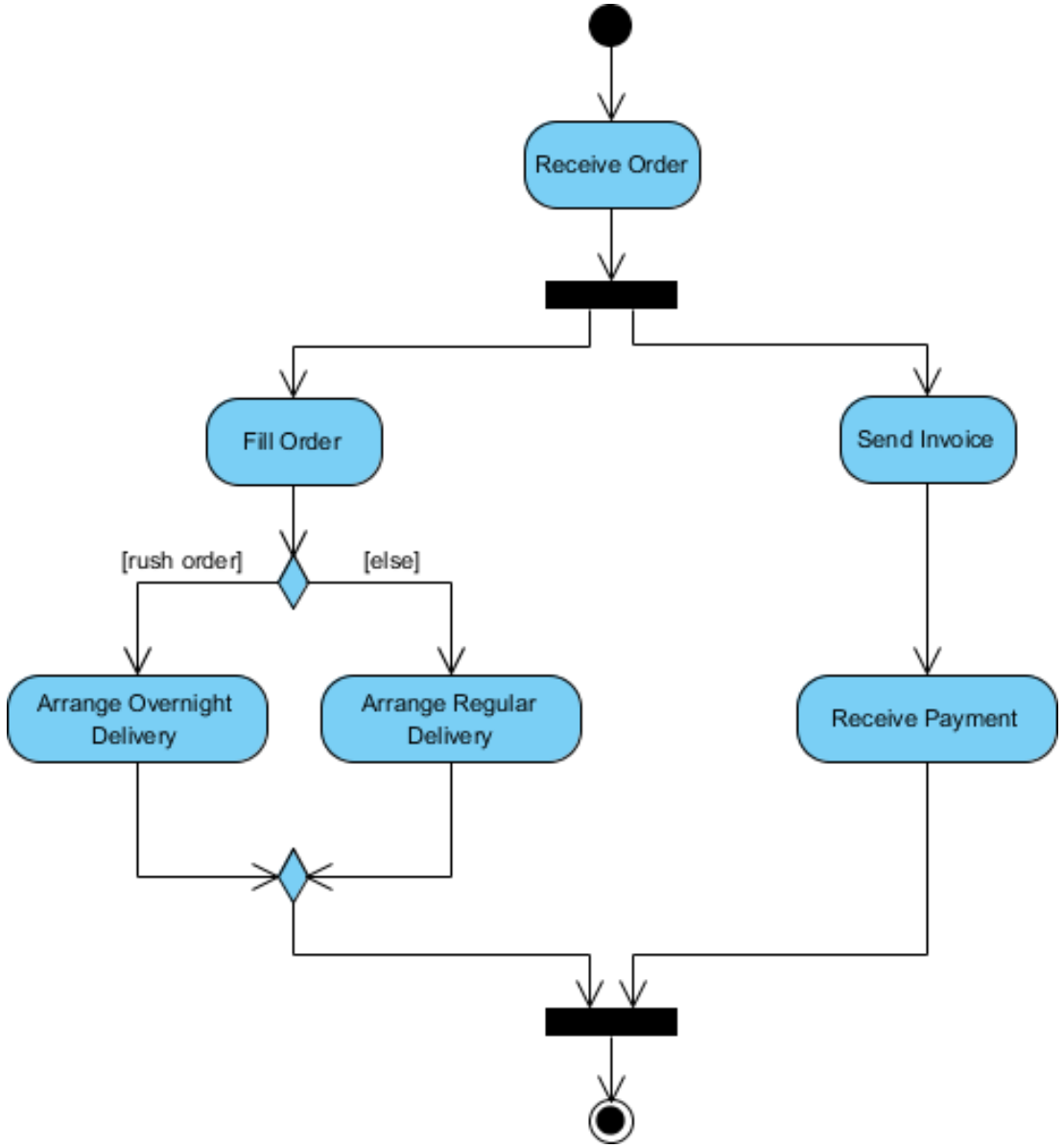
ACTIVITY DIAGRAM EXAMPLE – PROCESS ORDER

Process Order - Problem Description

Once the order is received, the activities split into two parallel sets of activities. One side fills and sends the order while the other handles the billing.

On the Fill Order side, the method of delivery is decided conditionally. Depending on the condition either the Overnight Delivery activity or the Regular Delivery activity is performed.

Finally the parallel activities combine to close the order.



ACTIVITY DIAGRAM EXAMPLE - STUDENT ENROLLMENT

This UML activity diagram example describes a process for student enrollment in a university as follows:

An applicant wants to enroll in the university.

The applicant hands a filled out copy of Enrollment Form.

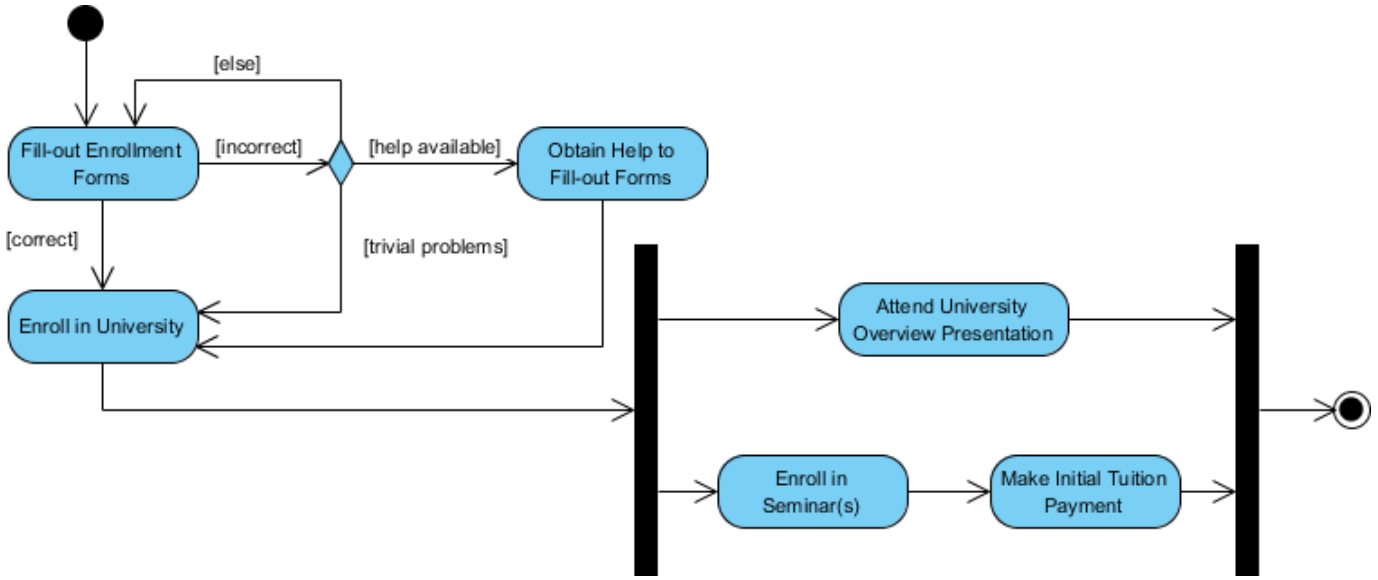
The registrar inspects the forms.

The registrar determines that the forms have been filled out properly.

The registrar informs student to attend in university overview presentation.

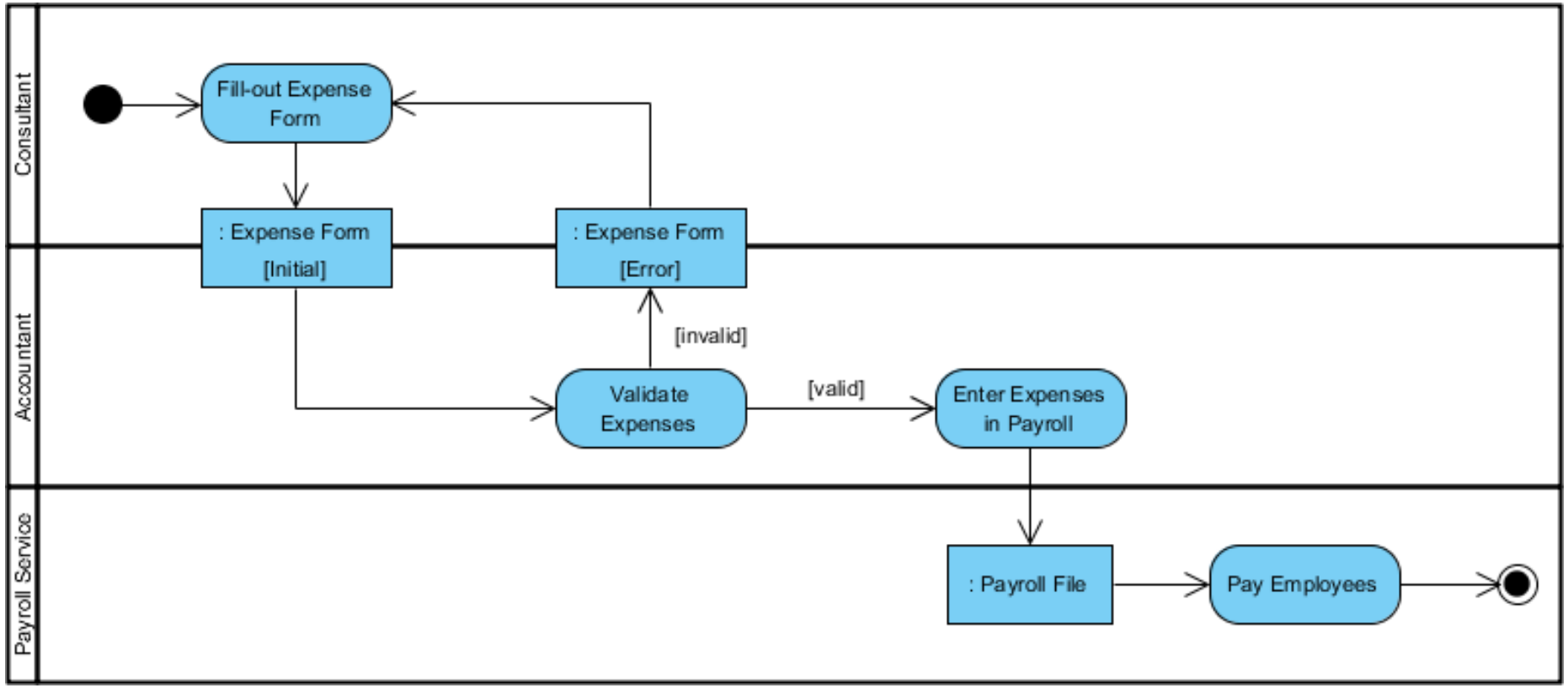
The registrar helps the student to enroll in seminars

The registrar asks the student to pay for the initial tuition.



ACTIVITY DIAGRAM - SWIMLANE

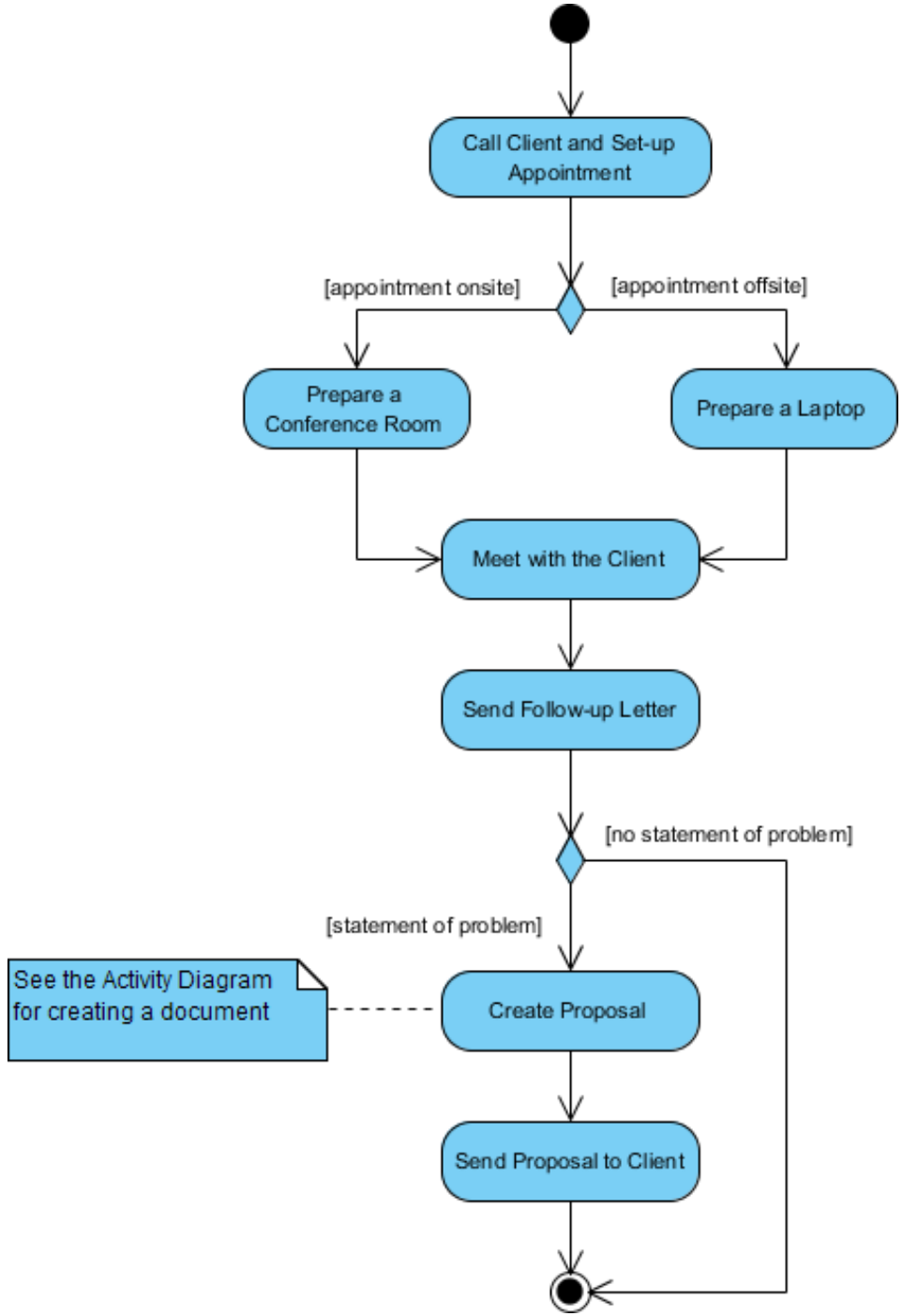
A swimlane is a way to group activities performed by the same actor on an activity diagram or to group activities in a single thread. Here is an example of a Swimlane activity diagram for modeling Staff Expenses Submission:



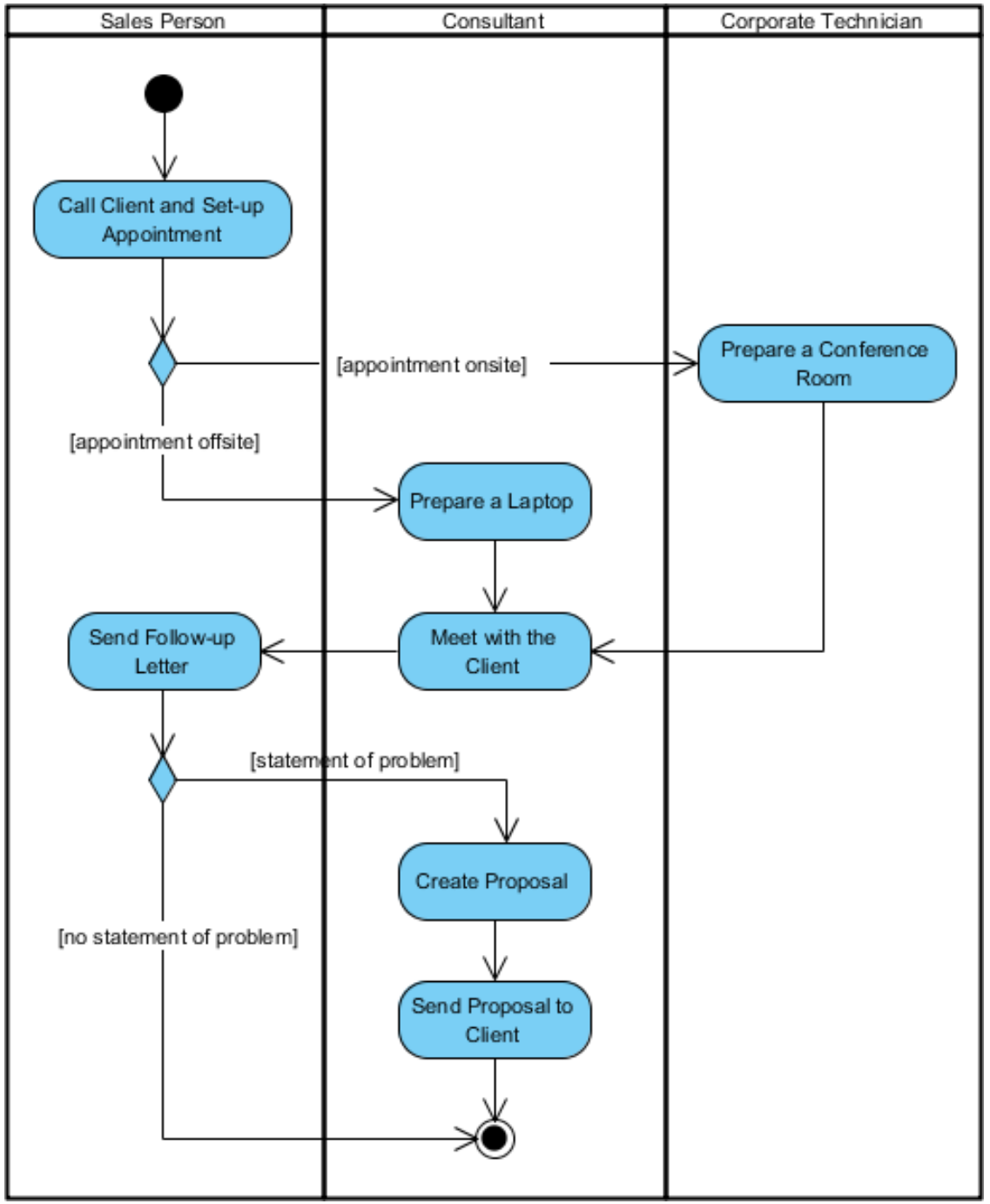
SWIMLANE AND NON-SWIMLANE ACTIVITY DIAGRAM

- Non-swimlane: Sequential flow only
- Swimlane: Responsibility-based grouping
- Helps in role-based workflow modeling

The activity diagram example below describes the business process for meeting a new client using an activity Diagram without Swimlane.



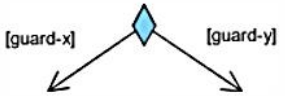
This figure below describes the business process for meeting a new client using an activity Diagram with Swimlane.



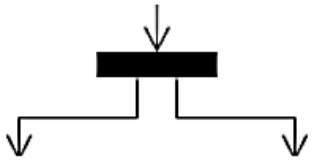
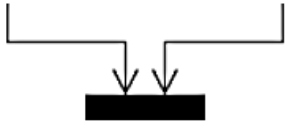
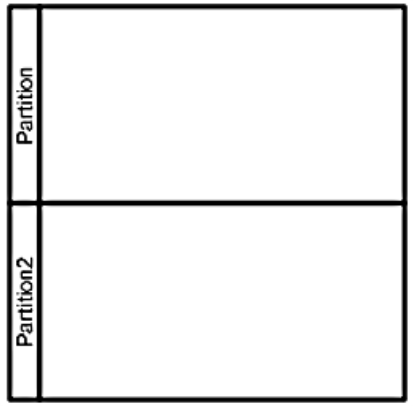
UML NOTATIONS IN ACTIVITY DIAGRAMS

Notation Description	UML Notation
Activity Is used to represent a set of actions	
Action A task to be performed	
Control Flow Shows the sequence of execution	
Object Flow Show the flow of an object from one activity (or action) to another activity (or action).	

UML NOTATIONS IN ACTIVITY DIAGRAMS

Initial Node Portrays the beginning of a set of actions or activities	
Activity Final Node Stop all control flows and object flows in an activity (or action)	
Object Node Represent an object that is connected to a set of Object Flows	
Decision Node Represent a test condition to ensure that the control flow or object flow only goes down one path	
Merge Node Bring back together different decision paths that were created using a decision-node.	

UML NOTATIONS IN ACTIVITY DIAGRAMS

Fork Node Split behavior into a set of parallel or concurrent flows of activities (or actions)	
Join Node Bring back together a set of parallel or concurrent flows of activities (or actions).	
Swimlane and Partition A way to group activities performed by the same actor on an activity diagram or to group activities in a single thread	

SUMMARY

- Activity diagrams model dynamic workflows.
- Useful in both system design and business analysis.
- Supports parallelism, decisions, and swimlanes.
- A vital part of UML toolkit.