Practical - 04

Subject: Object oriented Modeling and design.
Assignment title: Draw activity diagrams to model system workflows.
Semester / Year: VII Sem, fourth year.
Instructor: Saiprasad Bhise.
Submission date: 15/09/2025.

1] Objective:

- Understand and apply UML standards to model workflows and processes using activity diagrams.
- Represent system behaviour clearly through activities, decisions, concurrency and synchronization.
- Effectively communicate dynamic aspects of the system to stakeholders.

2] Problem statement -

- Draw one or more activity diagrams representing key workflows of a chosen application. Complement these diagrams with detailed descriptions of activities, decisions, concurrency and control flow.

3]. Introduction to activity diagram modelling -

- Activity diagrams are UML behavioural diagrams that depict the workflow of control and activities in a system.
- They model business processes, use case scenarios and detailed logic, clarifying how tasks are

performed sequentially or concurrently. Activity diagrams help teams understand workflows, detect bottlenecks and specify system behaviour before implementation.

4) Theory and Best Practices -

- UML Elements -
- Activity / Action - Task or step in the workflow
- Initial node - Starting point of workflow.
- Final node - end point of the workflow.
- Decision node - Branch point with conditions.
- Merge node - Combines alternative flows.
- Fork node - Splits flow into concurrent threads.
- Control flow - Arrows showing transition between activities.
- Swimlanes - partition between responsible actors or components.

- Naming notation -
- Use verb phrases for activity (eg. compose message)
- Label decision edges with guard conditions
- Arrange flow clearly generally top to bottom or left to right.

5) Assignment Workflow -

1. System definition and boundary - briefly describe workflow to be modeled.

2. Identify key activities and decisions - List important tasks, branching points and concurrent flows in the process.

3. Model control flow and concurrency - Identify where flow splits or merges, including parallel actions like sending and notifying.

4. Draw activity diagrams - Using UML notations depict the full process with all relevant nodes and transitions.

5. Document activity details - Provide detailed descriptions for at least two major activities or decision points, including preconditions, inputs and outcomes.

6. Stakeholder validation - Explain how feedback would be obtained to ensure the workflow accurately reflects user and system requirements.

6] Recommended tools -

- UML Tools : Draw IO, Microsoft Visio, Lucid chart, Astah., collaborative Tools - Miro, confluence.

7] System description -

Whatsapp is a popular messaging application enabling users to send texts, multimedia, and make calls over the internet. This assignment focuses on modeling the send message workflow illustrating user interaction and system processing from composing to message delivery.

8] Assignment requirements -

- System boundary : Define workflow scope.
- Activities - Clearly identified, sequentially and logically ordered.
- Decisions - Represented with clear conditions and outcome
- Concurrency - Properly modeled with forks and joins where needed.
- Diagrams - Standard UML notation and readable layout.
- Activity description - detailed explanation including input, output preconditions and exceptions.
- Stakeholder validation - Reflection or sample feedback to verify design accuracy.
- Documentation - professional formatting and clarity.

9] Activity template structure -

Activity name: Compose Message.

- Description: User enters text or media content in the chat input box.
- Inputs: User input texts, attachments.
- Outputs: Message ready to be sent.
- Preconditions - User logged in, chat opened.
- Post conditions - Message content validated.
- Exceptions - Input too long, unsupported media type.

10] Sample activity diagram overview -

User opens chat → composes message → validates content → presses send → message encrypted → message sent → delivery confirmation received → user notified.

11] Stakeholder validation -

- Conduct walkthroughs with end users and developers.
- Gather feedback on clarity of workflow and completeness of steps.
- Adjust the model to address any gaps or confusion.

12] Deliverables -

- Title page with metadata.
- Introduction to activity diagram, modelling
- Clear well labelled activity diagram using UML notations.
- Detailed activity descriptions for minimum two key activities or decisions.
- Optional stakeholder validation.
- Typed well formatted document.

13] Evaluation Criteria -

- Correct use of UML activity diagram notation and symbols.

- Clear representation of sequential, concurrent workflows.
- Completeness and clarity of descriptions.
- Professional presentation and formatting.
- Timely submission.

14] CONCLUSION:

Activity diagrams help visualize detailed workflows and system behaviours, enabling clear understanding and communication among stakeholders.
Modeling processes like message sending in whatsapp provides valuable insights for design, testing and implementation phases and software development.