## 4.2 Activity Diagram:

- Activity diagram is another important diagram in UML to describe the dynamic aspects of the system.

- Activity diagram is basically a flowchart to represent the flow from one activity to another activity. The activity can be described as an operation of the system.

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

- The basic purposes of activity diagrams are similar to other four diagrams. It captures the dynamic behavior of the system. Other four diagrams are used to show the message flow from one object to another but activity diagram is used to show message flow from one activity to another.

- Activity is a particular operation of the system. Activity diagrams are not only used for visualizing the dynamic nature of a system, but they are also used to construct the executable system by using forward and reverse engineering techniques. The only missing thing in the activity diagram is the message part.

- It does not show any message flow from one activity to another. Activity diagram is sometimes considered as the flowchart. Although the diagrams look like a flowchart, they are not. It shows different flows such as parallel, branched, concurrent, and single.

- User activity components

Initial State or Start Point:
A small filled circle followed by an arrow represents the initial action state or the start point for any activity diagram. make sure the start point is placed in the top left corner of the first column.
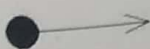
Activity or Action State

An action state represents the non-interruptible action of objects. You can draw an action state in SmartDraw using a rectangle with rounded corners.

Activity

Activity
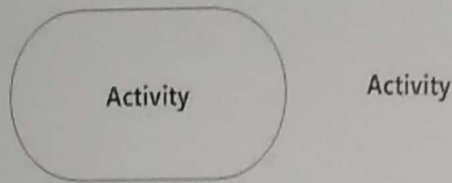
Action Flow

Action flows, also called edges and paths, illustrate the transitions from one action state to another. They are usually drawn with an arrowed line.

Action Flow

Object Flow

Object flow refers to the creation and modification of objects by activities. An object flow arrow from an action to an object means that the action creates or influences the object. An object flow arrow from an object to an action indicates that the action state uses the object.

Activity

Object Flow

Class/Object
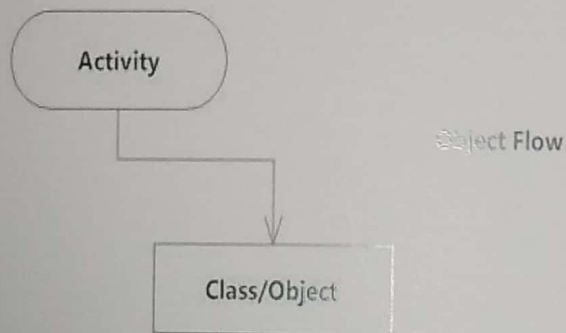
Decisions and Branching

A diamond represents a decision with alternate paths. When an activity requires a decision prior to moving on to the next activity, add a diamond between the two activities. The outgoing alternates should be labeled with a condition or guard expression. You can also label one of the paths "else."

Decision Symbol
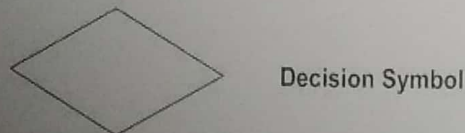
Guards

In UML, guards are a statement written next to a decision diamond that must be true before moving next to the next activity. These are not essential, but are useful when a specific answer, such as "Yes, three labels are printed," is needed before moving forward.
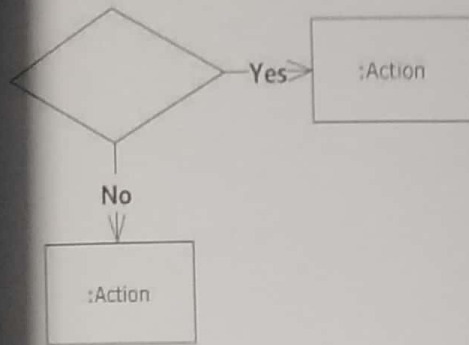
Guard Symbols

Synchronization

A fork node is used to split a single incoming flow into multiple concurrent flows. It is represented as a straight, slightly thicker line in an activity diagram.

A join node joins multiple concurrent flows back into a single outgoing flow.

A fork and join mode used together are often referred to as synchronization.

Synchronization

Add Rate Activity:

Add Rate Activity:

```
                        ●
                        │
                        ▼
              ┌───────────────────┐
              │  Select Service   │
              └───────────────────┘
                        │
                        ▼
              ┌───────────────────┐◄──────────────────────────┐
              │     Add Rate      │                           │
              └───────────────────┘                           │
                        │                                     │
                        ▼                                     │
                      ◢◣         No      ┌──────────────────┐ │
                 ◢ Logged In ◣ ────────► │      Login       │◄┐│
                  ◥   In   ◤             └──────────────────┘ ││
                      ◥◤                           │      Yes ││
                        │                          │  No      ││
                        │                          ▼          ││
                    Yes │                        ◢◣           ││
                        │                    ◢ Is Valid ◣ ────┘│
                        ▼                     ◥        ◤        │
              ┌───────────────────┐            ◥◤─────────────┘
              │   Rate & Review   │
              │      Stored       │
              └───────────────────┘
                        │
                        ▼
                       ◉
```
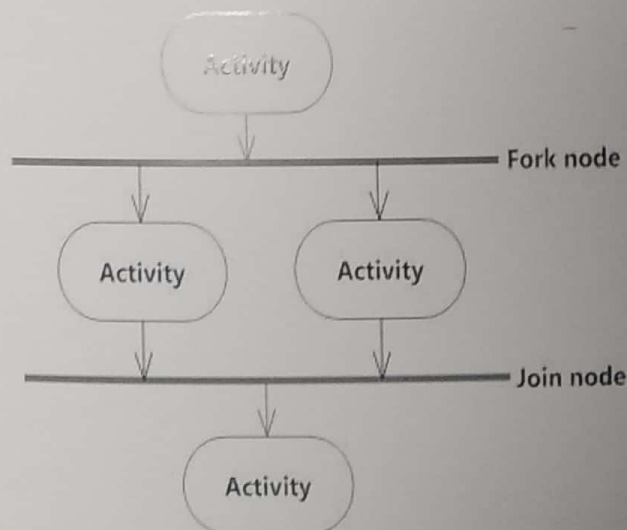
Add Request Activity:

```
                    ●
                    │
                    ▼
            ┌─────────────────┐
            │ Request Product │
            └─────────────────┘
                    │
                    ▼
                  ◇ Logged In ◇ ──No──▶ ┌───────┐ ◀──── No
                    │                    │ Login │
                    │                    └───────┘
                    │                        │
                    │                        ▼
                   Yes                    ◇ Is Valid ◇ ───▶
                    │                        │
                    │                       Yes
                    ▼                        ▼
            ════════════════════════════════════
                    │
                    ▼
               ◇ Check    ◇ ──No──▶ ┌──────────────┐
               ◇ Min Limit◇          │ Display Error │
                    │                └──────────────┘
                   Yes
                    ▼
            ┌─────────────────┐
            │ Request Saved   │
            └─────────────────┘
                    │
                    ▼
                   ◉
```
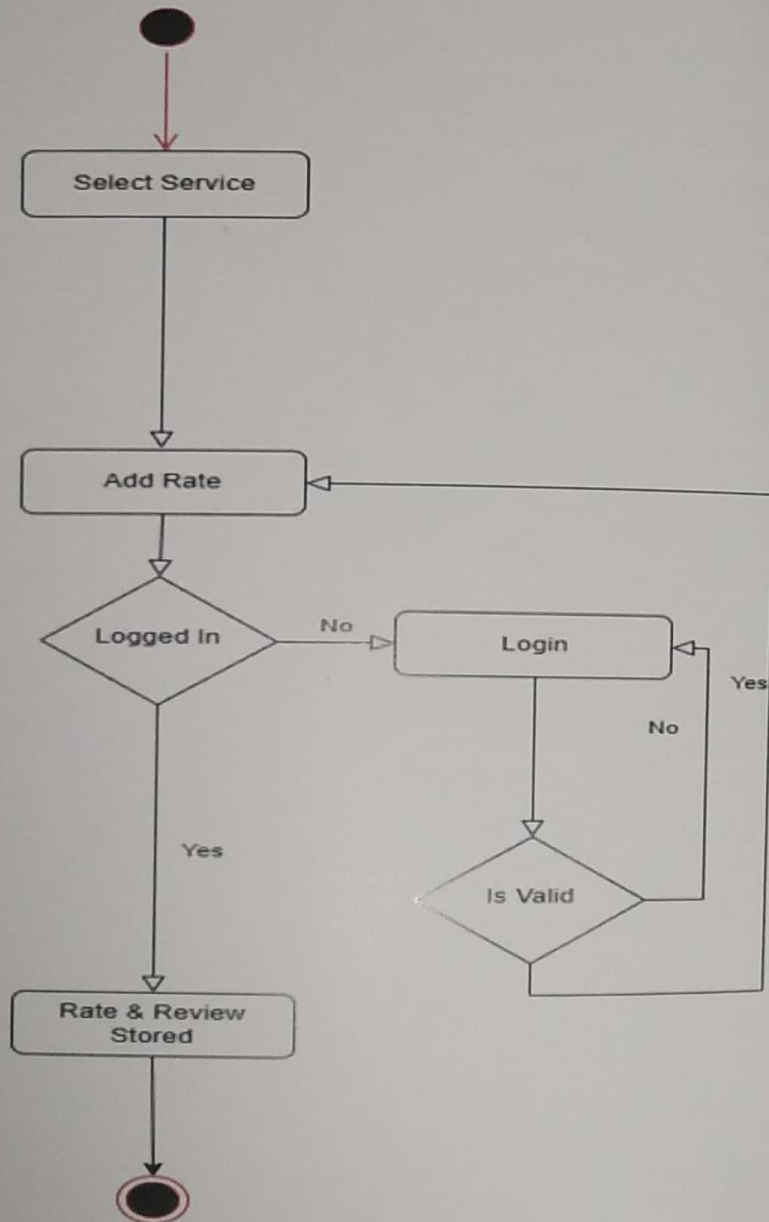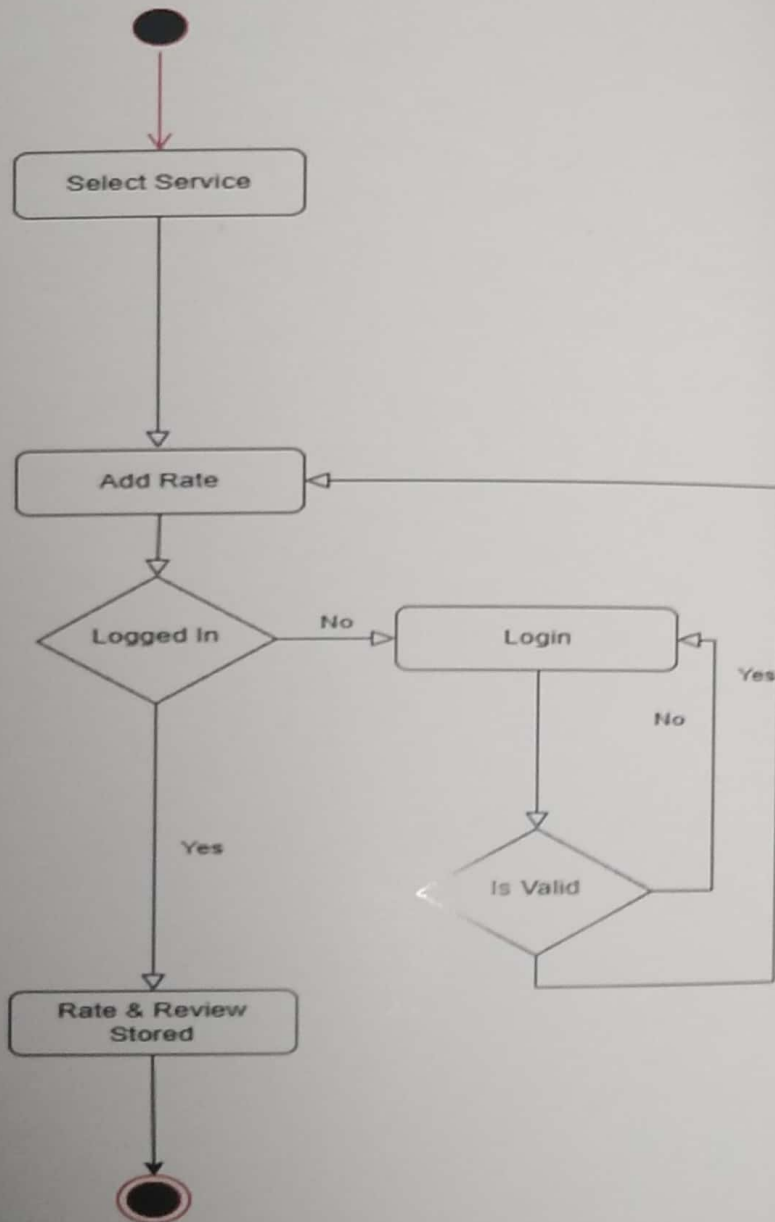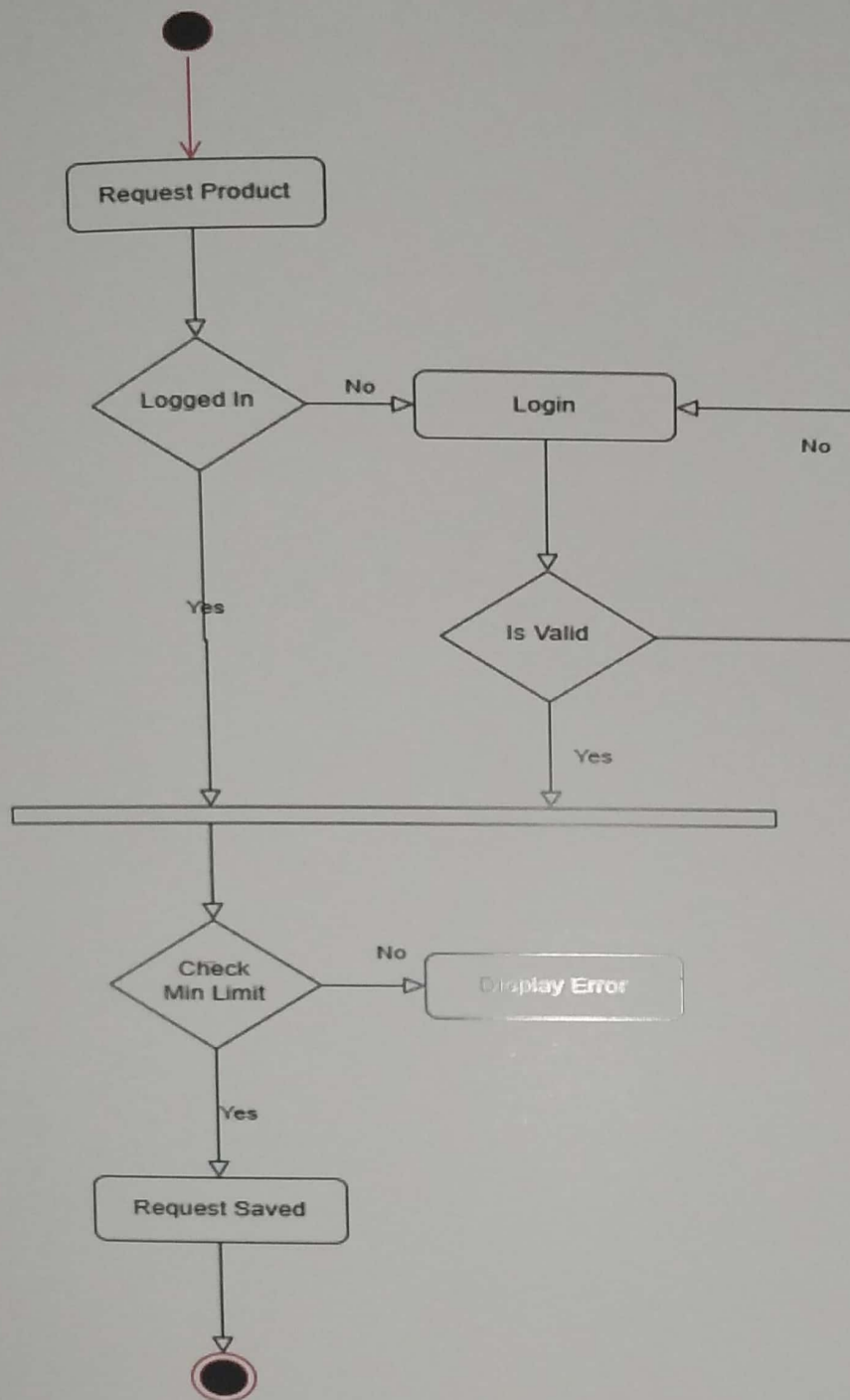
Check Profile Activity:

Checkout Activity:

Checkout

Pending Requests

No → Display Error

Yes

Fill Payment Info

Checkout Saved

Login Activity:

User Enter Email&Password

Is Valid

Yes → Invalid Credentials

No

User Successfully Logged

User Services Displayed

Register Activity:

```
                    ●
                    │
                    ▼
          ┌───────────────────┐
          │ Input Registeration│
          │       Data         │
          └───────────────────┘
                    │
                    ▼
                  ◇ Is Valid ◇ ──── No ────▶ ┌──────────────┐
                                              │ Display Error │
                    │                         └──────────────┘
                   Yes
                    │
                    ▼
                  ◇ Check ◇ ──── Yes ────▶ ┌──────────────┐
                  Duplication               │ Display Error │
                                            └──────────────┘
                    │
                   No
                    │
                    ▼
          ┌──────────────┐
          │  Store Data  │
          └──────────────┘
                    │
                    ▼
                   ◉
```
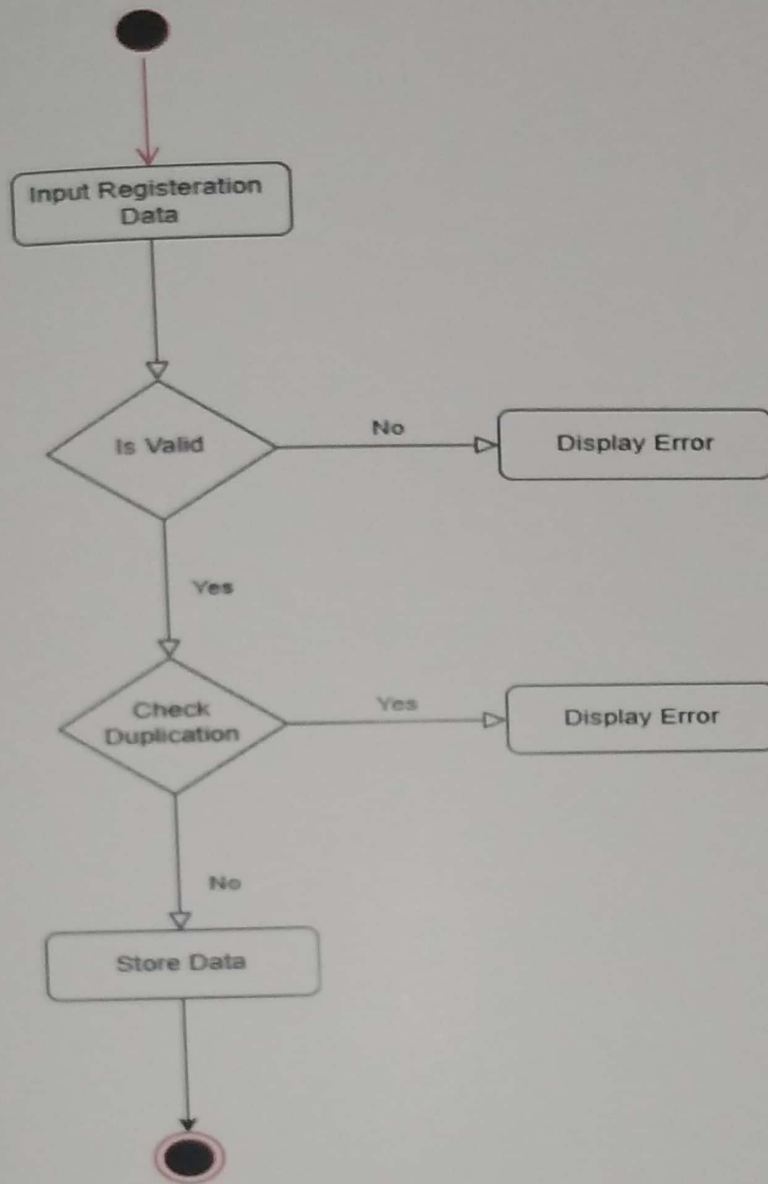
Send Feedback Activity: