Assignment 7

Title: Prepare and Implement state model

Problem Statement:

- Prepare a State Model.
- Identify States and events for your system.
- Study state transitions and identify Guard conditions.
- Draw State chart diagram with advanced UML 2 notations.
- Implement the state model with a suitable OO language

Objective:

- To Identify States Transitions, events in the system flow.
- Draw State Diagram and Implement Model.

Theory:

State Machine Diagram:

A state machine diagram models the behavior of a single object, specifying the sequence of events that an object goes through during its lifetime in response to events.The name of the diagram itself clarifies the purpose of the diagram and other details. It describes different states of a component in a system. The states are specific to a component/object of a system.
A State chart diagram describes a state machine. Now to clarify it state machine can be defined as a machine which defines different states of an object and these states are controlled by external or internal events. As a state chart diagram defines states it is used to model the lifetime of an object.

Purpose:

State chart diagram is one of the five UML diagrams used to model the dynamic nature of a system. They define different states of an object during its lifetime. And these states are changed by events. So, State chart diagrams are useful to model reactive systems. Reactive systems can be defined as a system that responds to external or internal events.
State chart diagram describes the flow of control from one state to another state. States are defined as a condition in which an object exists and it changes when some event is triggered. Hence the most important purpose of State chart diagrams is to model the life time of an object from creation to termination.

State chart diagrams are also used for forward and reverse engineering of a system. But the main purpose is to model reactive systems.
Following are the main purposes of using State chart diagrams:

➢ To model dynamic aspect of a system.

➢ To model life time of a reactive system.

➢ To describe different states of an object during its life time.

➢ Define a state machine to model states of an object.

States

A state is denoted by a round-cornered rectangle with the name of the state written inside it.

- **Initial and Final States**

  The initial state is denoted by a filled black circle and may be labeled with a name. The final state is denoted by a circle with a dot inside and may also be labeled with a name.

- **Transitions**

  Transitions from one state to the next are denoted by lines with arrowheads. A transition may have a trigger, a guard and an effect.
  "Trigger" is the cause of the transition, which could be a signal, an event, a change in some condition, or the passage of time.
  "Guard" is a condition which must be true in order for the trigger to cause the transition. "Effect" is an action which will be invoked directly on the object that owns the state machine as a result of the transition.

- **Entry Point**

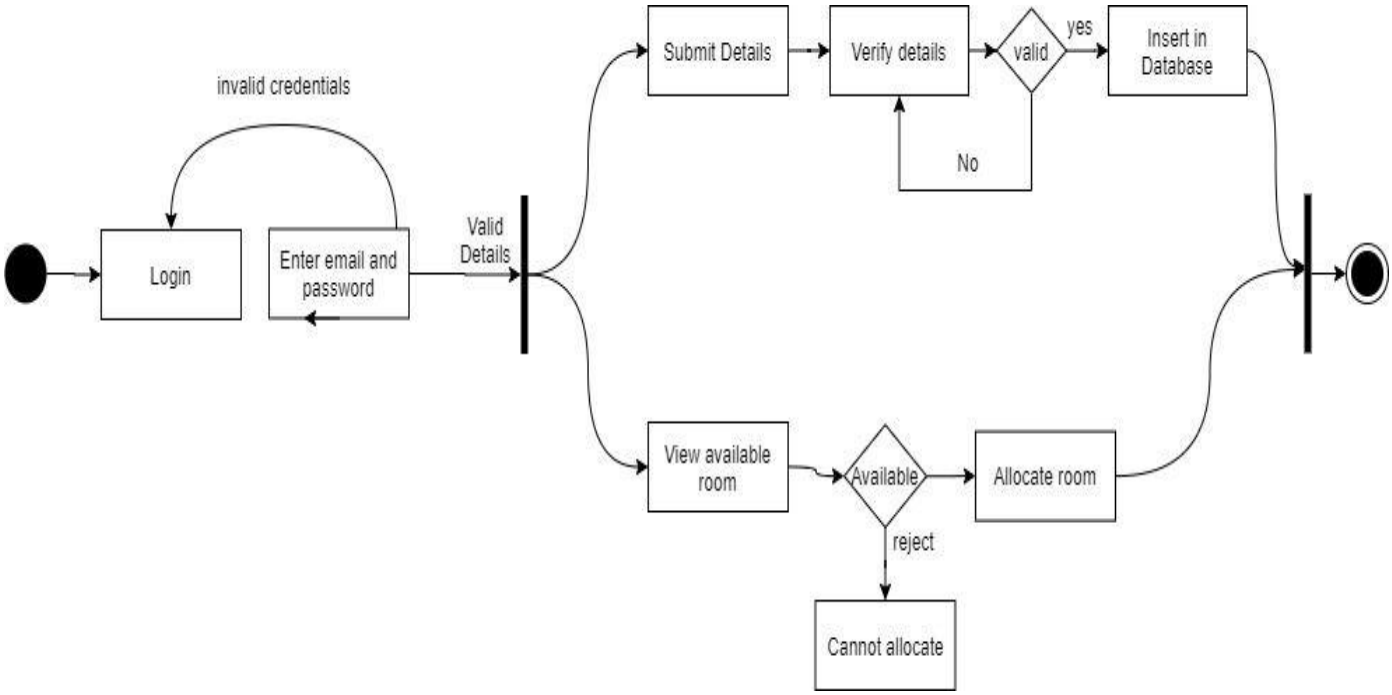
  Sometimes you won't want to enter a sub-machine at the normal initial state. For example, in the following sub-machine it would be normal to begin in the "Initializing" state, but if for some reason it wasn't necessary to perform the initialization, it would be possible to begin in the "Ready" state by transitioning to the named entry point.

- **Exit Point**

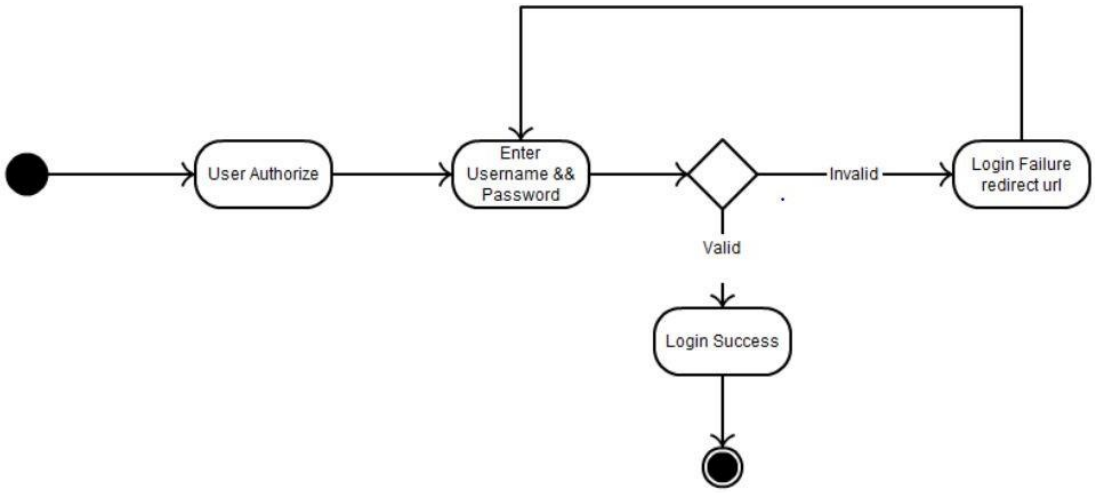
  In a similar manner to entry points, it is possible to have named alternative exit points. The following diagram gives an example where the state executed after the main processing state depends on which route is used to transition out of the state.

State of our system:

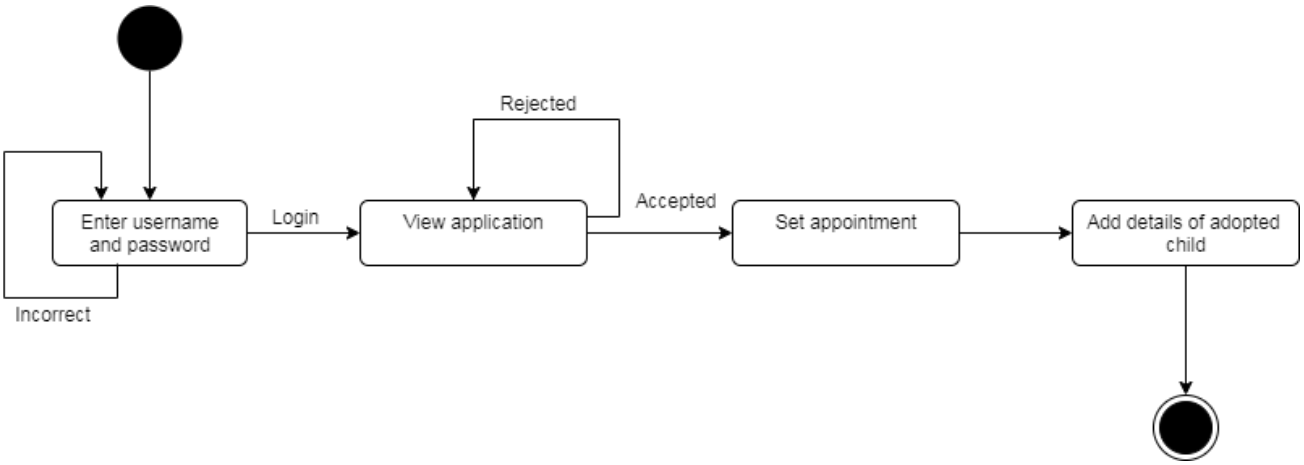
1. Register a child



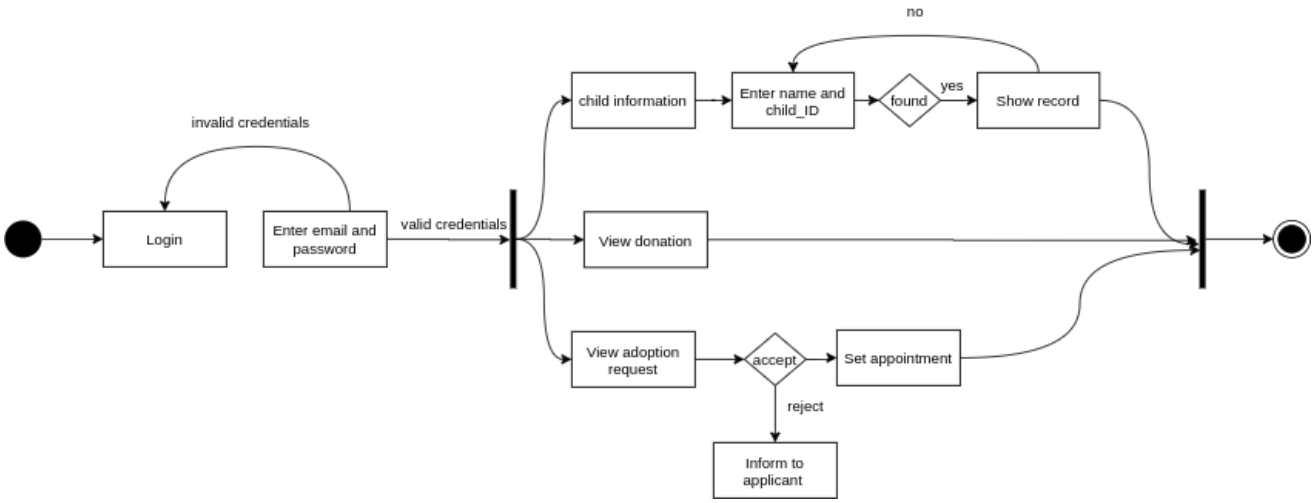
2. Admin Login Authentication



3) Adoption:



3) Admin:



Conclusion:

Thus, in this assignment, we learnt about the state diagram, how to draw one andimplemented the same.