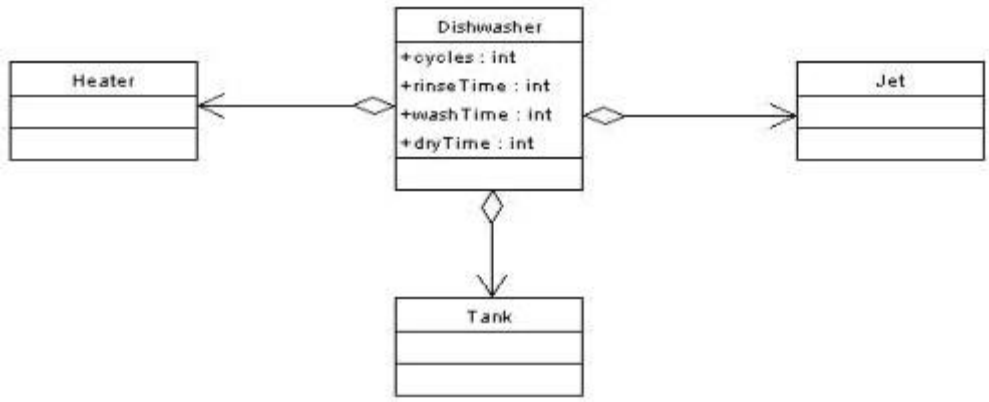
LAB TASK 11

Q 1 Analysis and Design the State Machine/State Chart Diagram for given System.

The Dishwasher System:

Consider the static structure of the Dishwasher system. The Dishwasher system consists of five classes, namely *Dishwasher*, *Jet*, *Tank* and *Heater*. The *Dishwasher* class has four attributes namely, *cycle*, *rinseTime*, *washTime* and *dryTime* of type *int*.



1) *The PowerOn state is a composite state with two concurrent regions Active and Mode. These regions become active at the same time whenever the PowerOn state gets activated. Each of the concurrent regions has a number of sequential substates. Only one of the sequential substates becomes active at a given time. Whenever PowerOn state becomes active, DoorClosed in the Active region and Normal state in the Mode region become active at the same time as they are the default states in each of the corresponding concurrent regions of the PowerOn composite state. Stop, Filling, Rinsing, Washing, Draining and Drying sequential substates. When the DoorClosed state is active, exactly one of its sequential substates is also active at the same time. On open event the dishwasher switches to Door Open state in the Active region. On close event, it switches into the history state of the Door Closed state and recalls the last active substate of the DoorClosed state. Similarly, on intMode, normMode or quickMode event, the Dishwasher switches to the next sequential substate in the Mode region*

2) *Design a statechart of Tank class it has four top-level states Empty, Fill, Full and Drain. These states are activated alternatively whenever a tankFill, tankFull, tankDrain, or tankEmpty event occurs. Initially, the Tank is in the default state Empty, where it accepts the tankFill event. The Tank reacts on such an event by switching from the Empty state to the Fill state.*

3) Design a statechart of the Jet class. It has two top-level states Idle and Running. Initially, the Jet is in the default state Idle, where it accepts the jetOn event. The Jet reacts on such an event by switching from the Idle state to the Running state. The Running state is a composite hierarchical state containing two sequential substate Spraying and Pulsing. Only one of the sequential substates becomes active at a given time. Whenever running state becomes active, Spraying state becomes active at the same time as it is the default state of the composite Running state. While in Running state, on jetPulse event, the tank switches to the next sequential substate Pulsing. On jetOff event the Jet switches back to Idle state.

4) Design a statechart of the Heater class It has two top-level states Off and On. Initially, the Heater is in the default state Off, where it accepts the heaterOn event. The heater reacts on such an event by switching from the Off state to the On state. On heaterOff event it switches back to the Off state.

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ATM Machine

ATM is at IDLE state. After the power is turned on, ATM performs startup activity and enters Self-Test state. In the event that the test falls flat, ATM goes into Out of Service state, generally there is triggerless transition to the Idle state. In this state ATM wiats for client.

The ATM state changes from Idle to Serving Customer when the client insert debit or Mastercard in the ATM's card reader. On entering the Serving client state, the section activity readCard is performed. Note, that progress from Serving Customer state back to the Idle state could be activated by cancel occasion as the client could cancel transaction whenever.

Serving Customer state is a composite state with sequential sub states Customer Authentication, Selecting Transaction and Transaction. Customer Authentication and Transaction are composite states by themselves which is shown with hidden decomposition indicator icon. Serving Customer state has triggerless transition back to the Idle state after transaction is finished. The state also has exit action ejectCard which releases customer's card on leaving the state, no matter what caused the transition out of the state.