QStateDesignPattern01
Draw a state design pattern class diagram for the following description and implement

[Identify class/classes, attributes, methods, relationships, relationship end names, multiplicity and show them clearly in the class diagram]
No GUI or user inputs are expected. Test your class diagram through a main() method with the given test input

1. A software tester enters a defect in a Defect Tracking system (DTS). When this happens, the defect goes into a state 'available'. Now, a software developer can acquire the 'available' defect. When the developer acquires this defect, it is goes from 'available' state to 'In Progress' state and that developer is called owner of the defect. Now no other developer can acquire it. Owner keeps working on 'In progress' defect. Once the defect is fixed ie the solution is found, it goes from ' in progress' state to the 'Ready for review' state. Reviewer reviews the solution of 'ready for review' defect. If reviewer is satisfied about solution, the defect goes to the state 'Resolved' else it goes to the 'available' state.

QStateDesignPattern02
Draw a state design pattern class diagram for the following description and implement

[Identify class/classes, attributes, methods, relationships, relationship end names, multiplicity and show them clearly in the class diagram]
No GUI or user inputs are expected. Test your class diagram through a main() method with the given test input

2. A simple digital watch has a 'display time' state, 'set hours' state and 'set minutes' state. It has two buttons, button A and B. When the watch is in 'display time' state and button A is pressed then it goes to 'set hours' state. If the watch is in 'set hours' state and button A is pressed then it goes to 'set minutes' state.

   When the watch is in 'display time' state and button B is pressed there is no change in the state of the watch. When the watch is in 'set hours' state and button B is pressed, then the hour value in the display advances and the watch remains in the same state. When the watch is in 'set minutes' state and button B is pressed, then the minute value in the display advances and the watch remains in the same state.

   The initial state of the watch is 'display time' state.

QStateDesignPattern03
Draw a state design pattern class diagram for the following description and implement

[Identify class/classes, attributes, methods, relationships, relationship end names, multiplicity and show them clearly in the class diagram]
No GUI or user inputs are expected. Test your class diagram through a main() method with the given test input

Draw a state design pattern class diagram for the following description and implement

3. A Copy machine has display panel, ready light. When the power is OFF the machine is in OFF state. When the power is on the machine, the machine goes to warming state. During warming state, the 'ready light' starts flashing. After doing the initial checks, the machine goes to ready state. When it is in ready state, the ready light is turned 'on', and it displays the number of copies as one and size as normal on the display panel. If the size and the no of copies are changed, the machine still remains in the same state. When a start button is pushed, the machine goes to copying state. Copying proceeds until all copies are complete. After this the machine goes into the ready state.

QStrategy01 Apply strategy design pattern for the following description

Draw the class diagram and implement the class diagram applying Strategy design pattern. Use the test inputs to demonstrate usage of each strategy.

[Identify classes, attributes, methods, relationships, end names, multiplicity and show them clearly in the class diagram]
No GUI or user inputs are expected. Test your class diagram through a main() method with the given test input

A travel company declares a trip and creates Trip entry. Trip entry has Destination, total price, start date and duration. Customer can book a trip after it is declared. Trip entry contains customer bookings.

Customer booking contains date booked, customer name, and number of travelers.

Following is the policy of discount applicable on the net price to be paid for the trip.

If the booking is done more than 30 days prior to the trip start date then a discount of 20% is applicable on the total trip price. If members are 4 or more then additional 5% discount is applicable.

If the booking is done between 29 days to 20 days prior to the trip start date then a discount of 15% is applicable on the trip price. If members are 4 or more then additional 4% discount is applicable.

If the booking is done less than 20 days prior to the trip start date then no discount is applicable. But if the members are 4 or more 3% discount is applicable.

QStrategy02 Apply strategy design pattern for the following description

Draw the class diagram and implement the class diagram applying Strategy design pattern. Use the test inputs to demonstrate usage of each strategy.

[Identify classes, attributes, methods, relationships, end names, multiplicity and show them clearly in the class diagram]
No GUI or user inputs are expected. Test your class diagram through a main() method with the given test input

A company has many employees. Each employee has a name, designation, basic pay and gross pay.

Following is the policy of calculating the salary for the employees based on their designation

Designation	Gross pay
Software Engineer	Basic pay + 20% of basic pay as traveling allowance
Project lead	Basic pay+ 30% of basic pay as traveling allowance + 30% of basic pay as on site allowance
Project manager	Basic pay+ 40% of basic pay as traveling allowance + 40% of basic pay as on site allowance

Calculate the total salary which the company should pay for 4 Software engineers, 2 project leads and 1 project manager

QStrategy03 Apply strategy design pattern for the following description

Draw the class diagram and implement the class diagram applying Strategy design pattern. Use the test inputs to demonstrate usage of each strategy.

[Identify classes, attributes, methods, relationships, end names, multiplicity and show them clearly in the class diagram]
No GUI or user inputs are expected. Test your class diagram through a main() method with the given test input

A bank issues many credit cards. Each credit card can earn pay back points on the basis of the purchases done using the credit card. Every purchase made using the credit card adds payback points to the credit card.

The policy for adding the payback points is as follows

Type of card	Payback points
Classic	1 payback point for every 200 Rs purchase
Silver	1 payback point for every 150 Rs purchase
Gold	1payback point for every 100 Rs purchase

Calculate the total payback points for the following details

Type of card	Purchase amount
Classic	50000.00
Silver	50000.00
Gold	70000.00

QTDD01: Apply test driven development approach for the following description

A lamp has a on/off switch and a dimmer. When the lamp is off the dimmer is not operational, when the lamp is on the dimmer varies the intensity of lamp in three levels.

QTDD02: Apply test driven development approach for the following description

A fan has a on/off switch and a regulator. When the fan is off the regulator is not operational, when the fan is on the regulator varies the speed of the fan in five steps. Step 1 minimum speed and step 5 maximum speed.