Assignment 1

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Problem 1

Encapuslated Sales Tax Behavior

<<interface>>
SalesTaxBehavior

+ compute(double value) : double

FourPointFivePercent

+ compute(double value) : double
//Computes 4.5% of value

SevenPercent

+ compute(double value) : double
//Computes 7% of value

NoTax

+ compute(double value) : double
//Returns 0.0

Client

State*

- stb : SalesTaxBehavior
- name : String

+ State(String name)
+ getName() : String
+ setName() : void
+ setSalesTaxBehavior(SalesTaxBehavior stb): void
+ showTax(double value) : void

Hawaii

+ Hawaii() //Passes "Hawaii" to super

Indiana

+ Indiana() //Passes "Indiana" to super

Alaska

+ Alaska() //Passes "Alaska" to super

*Abstract
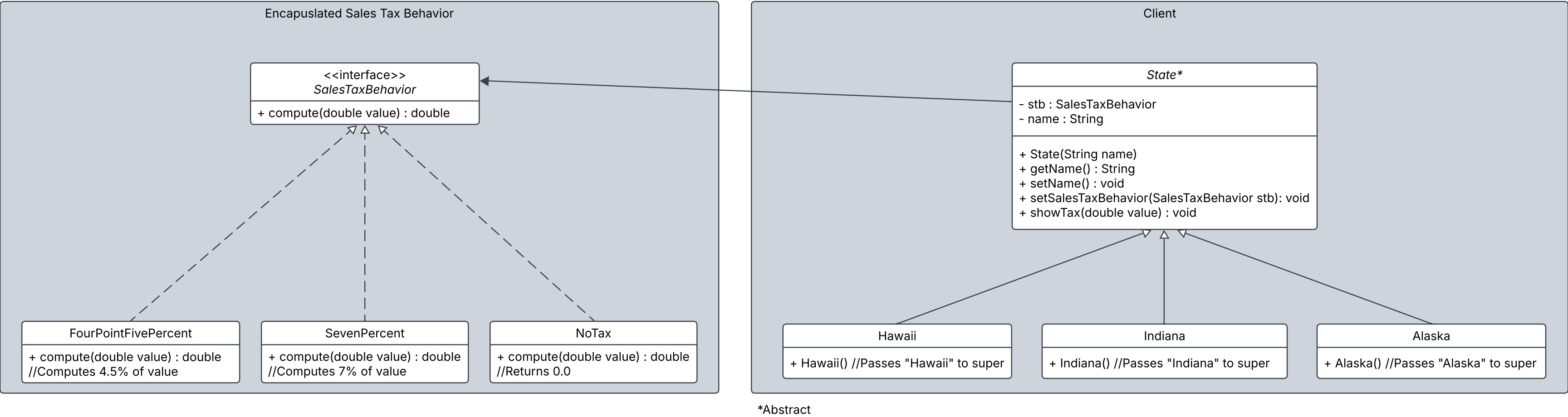
Problem 2

1-4: IS-A relationship since MallardDuck, RedheadDuck, RubberDuck, and DecoyDuck are all types of duck and are subclasses of the Duck super class: they inherit from Duck.

5-6: HAS-A relationship since the Duck class has a FlyingBehavior and a QuackBehavior which is called composition: Duck has FlyingBehavior and QuackBehavior as instance variables.

7-9: IS-A relationship since Quack, Squeak, and MuteQuack are each a QuackBehavior and implement the QuackBehavior interface: they inherit from QuackBehavior.

Problem 3

<<interface>>
Subject

+ registerBidder(Bidder b) : void
+ removeBidder(Bidder b) : void
+ notifyBidders() : void

Bidders

<<interface>>
Bidder

+ bid(double bid) : void
+ pay() : void

Phone

- auctioneer : Auctioneer

+ bid(double bid)
+ pay()

Online

- auctioneer : Auctioneer

+ bid(double bid)
+ pay()

InPerson

- auctioneer : Auctioneer

+ bid(double bid)
+ pay()

Auctioneer

- bidders : List<Bidders>
- minimumBid : double
- currentBid: double

+ registerBidder(Bidder b) : void
+ removeBidder(Bidder b) : void
+ notifyBidders() : void
+ setMinimumBid(double minimumBid) : void
+ setCurrentBid(double bid) : void
+ acceptBid() : void

Subject