Problem 1 Part B

State

| # name: String |
| #salesTaxBehavior: SalesTaxBehavior |
| + getName(): String |
| + setName(String name): void |
| +setSalesTaxBehavior(SalesTaxBehavior salesTaxBehavior): void |
| +showTax(double value): void |

SalesTaxCalculator

| + main(String[] args): void |

Alaska

| + Alaska (): void |

Indiana

| + Indiana (): void |

Hawaii

| + Hawaii (): void |

<<interface>>
SalesTaxBehavior

| + compute(double value): double |

NoTax

| + compute(double value): double |

SevenPercent

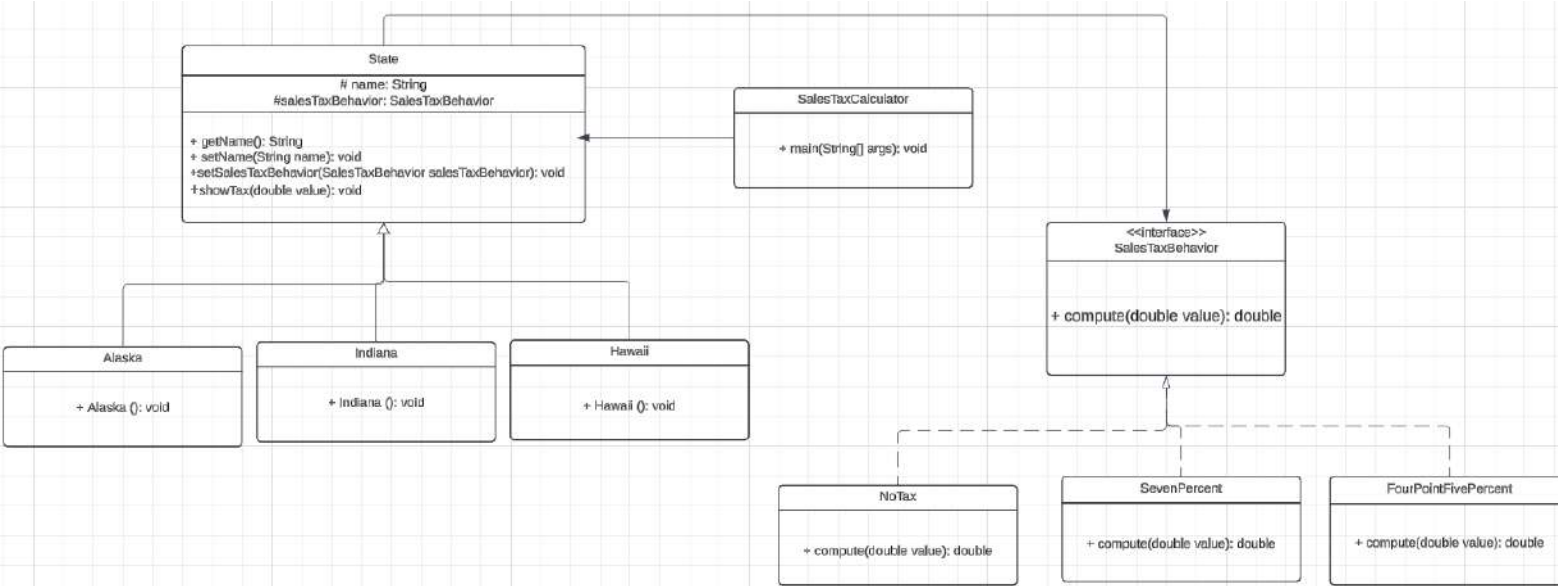| + compute(double value): double |

FourPointFivePercent

| + compute(double value): double |

Problem 2: HAS-A and IS-A

1. **IS-A:** It's because a subclass (MallardDuck) is derived from a base class (Duck): Mallard duck IS-A duck.
2. **IS-A:** It's because a subclass (RedheadDuck) is derived from a base class (Duck): Red head duck IS-A duck.
3. **IS-A:** It's because a subclass (RubberDuck) is derived from a base class (Duck): Rubber duck IS-A duck.
4. **IS-A:** It's because a subclass (DecoyDuck) is derived from a base class (Duck): Decoy duck IS-A duck.
5. **HAS-A:** It's because base class (Duck) has instance variable that are objects of other class (FlyBehavior): Duck HAS-A fly behavior.
6. **HAS-A:** It's because base class (Duck) has instance variable that are objects of other class (QuackBehavior): Duck HAS-A quack behavior.
7. **IS-A:** It's because a subclass (Quack) is derived from a base class (QuackBehavior): Quack IS-A quack behavior.
8. **IS-A:** It's because a subclass (Squeak) is derived from a base class (QuackBehavior): Squeak IS-A quack behavior.
9. **IS-A:** It's because a subclass (MuteQuack) is derived from a base class (QuackBehavior): Mute quack IS-A quack behavior.

Problem 3

Auctioneer

- minimumBid: double
- currentHighBid: double
- highestBidder: Bidder

+ registerObserver(): void
+ removeObserver(): void
+ notifyObserver(): void

+ setMinimumBid(double amount): void
+ broadcastBid(): void
+ acceptBid(Bidder bidder, double bidAmount): void

<<interface>> Subject

+ registerObserver(): void
+ removeObserver(): void
+ notifyObserver(): void

Bidder

name: String
bidAmount: double

+ update(): void
+ placeBid(double amount): void
+ submitBid(): void
+ payBid(): void

<<interface>> Observer

+ update(): void

InPersonBidder

+ InPersonBidder(String name)

OnlineBidder

+ OnlineBidder(String name)

PhoneBidder

+ PhoneBidder(String name)