Reflection Document

Problem 1:

1.What pattern or patterns were used to solve the problem?

A: I used the Factory design pattern to solve the problem.

2.Why were a pattern or patterns chosen to solve the problem?

A: The Factory pattern helps me create different toys (cars, dollhouses, stuffed animals, and rainbow stackers) easily. Since all toys need the same 9 basic features but work differently, the Factory pattern lets someone ask for any toy by name, and my code makes the right one without them needing to know how.

3.What challenges were faced while attempting to solve the problem?

A: It was hard to think of 3 special features for each toy that only make sense for that toy (like how many rooms for a dollhouse). Coming up with 2 actions each toy can do was also tricky. I had to make sure I didn't use features that would work for all toys, like color.

4.Include any references or documentation found during your research on solving the problem

A: Week 10 - Design Patterns Part 1 and https://github.com/27344-202515/advanced-dotnet-w2025/blob/master/Week10_2_Factory/Classes.cs

Problem 2:

1.What pattern or patterns were used to solve the problem?

A: I used the Builder design pattern to solve the problem.

2.Why were a pattern or patterns chosen to solve the problem?

A: I chose the Builder pattern because making a computer needs many parts with lots of settings. Using normal constructors would be messy. The pattern lets me build step-by-step, keeps building separate from the final product, and lets me chain methods together.

3.What challenges were faced while attempting to solve the problem?

A: My main challenge was adding all the error checks and picking the right data types while keeping the code easy to read.

4.Include any references or documentation found during your research on solving the problem

A: Week 10 - Design Patterns Part 1 and https://github.com/27344-202515/advanced-dotnet-w2025/blob/master/Week10_6_CreationalDesignPatterns/Builder.cs

Problem 3:

1. What pattern or patterns were used to solve the problem?
A: I used a combination of an Object Pool and Chain of Responsibility.

2. Why were a pattern or patterns chosen to solve the problem?

A: The Object Pool allowed to schedule workers to handle each package, then when complete would become available for usage again. The Chain of Responsibility allows for Mail to be checked for a trait, than passed off if it didn't fit.

3. What challenges were faced while attempting to solve the problem?

A: Implementing two patterns was a pretty confusing process, I had to determine how they fit together as well as when and where to call the methods for each pattern.

4. Include any references or documentation found during your research on solving the problem

A: I basically just used the GitHub Example provided as well as class notes (written after Problem 4, but basically the same process)

Problem 4:

1.What pattern or patterns were used to solve the problem?

A: I used the Observer pattern for problem 4.

2.Why were a pattern or patterns chosen to solve the problem?

A.I choose this pattern and it will handle the notify each person in the auction. as it create a list of observer for the auction that get notify when anyone else bid a valid amount or when a new item is place up for auction and when the auction is over

3. What challenges were faced while attempting to solve the problem?

A.It was mainly the logic of how to use this pattern and modify it to fit this problem. I had to add a few function that would create messages to send to the notifyBidder function that notifies all observer of the auction. the first problem I had was how to create a auctioneer first I was trying to add him as of observer but then releazise he is the on that controls the auction so I change the auctioneer into the "subject" or the class that handles the logic of the auction. he need receive messages from all observer but also need to send a respond to all the observer. I had to add a few line where the auctioneer would message the observer direct for invalid bids.

4. Include any references or documentation found during your research on solving the problem

A. I used the GitHub and the example we had in class along with the class notes.