Problem 1:

1. S
2. S
3. S
4. S
5. S
6. S
7. S
8. S

Problem 2:

1. GitHub Repository: <https://github.com/nataliecar/cognitive-modeling/tree/main>
2. Merge conflict on GitHub.
3. Explain differences:
4. git restore
5. git checkout
6. git reset
7. git revert

Problem 3:

Work

Problem 4:

1. We will show the following:
2. We will show the following:
3. We will show the transformation:

Suppose we have a normal distribution with and . We want to get to a new normal distribution with and .

We can apply the following linear transformation to do this:

We can use this linear transformation with and :

There is a Jupyter notebook on the GitHub that demonstrates this result.

Problem 5:

Let be a random variable that signifies if the statement is the truth or a lie. We have that . Let be the probability that “yes” response is true.

We know the following information:

We need to find the probability of the statement being true. Thus, we need to find .

We can do this using Bayes’ Rule:

We can find using the sum and product rules:

Therefore, we have the following probability:

There is a probability of that the statement was true.

Problem 6:

Work (code in repo)

Problem 7:

Work (code in repo)

Problem 8: View solution on the GitHub. There is a Jupyter notebook and Python script.

Problem 9:

Work (code in repo)