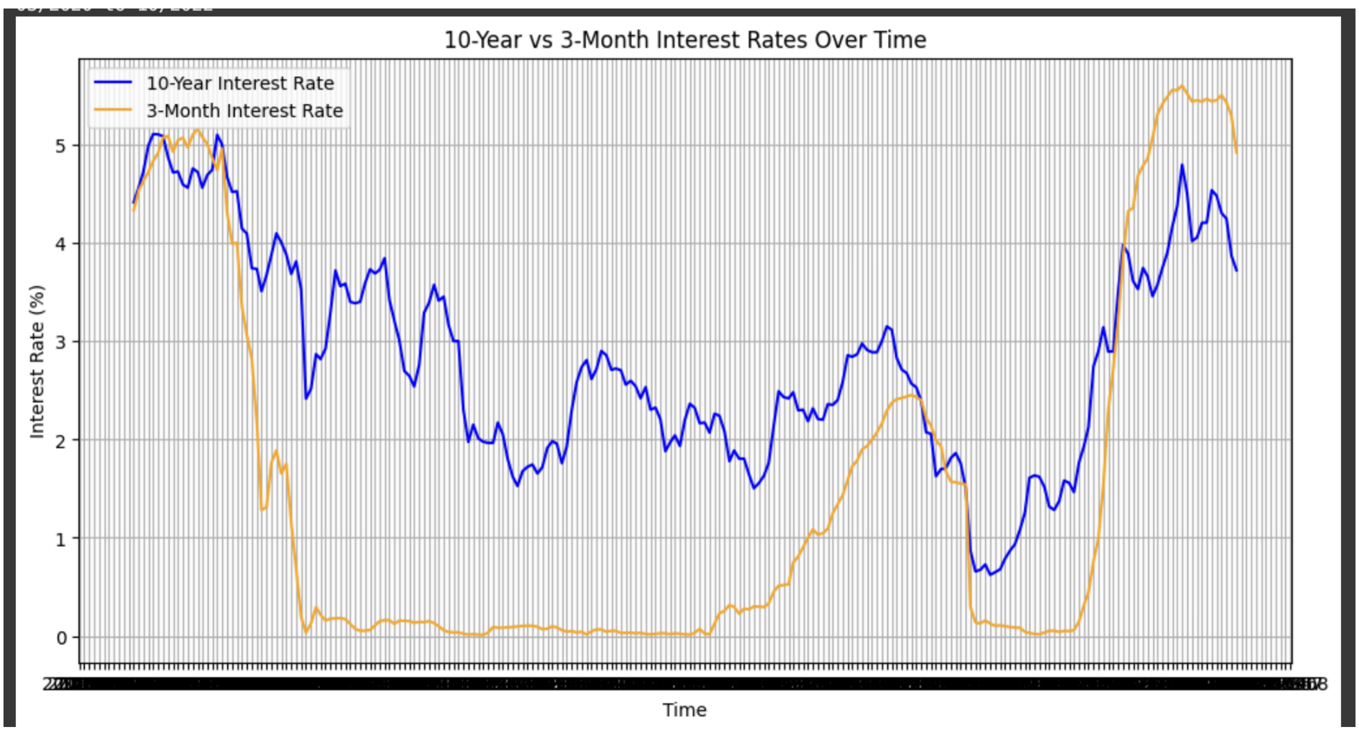
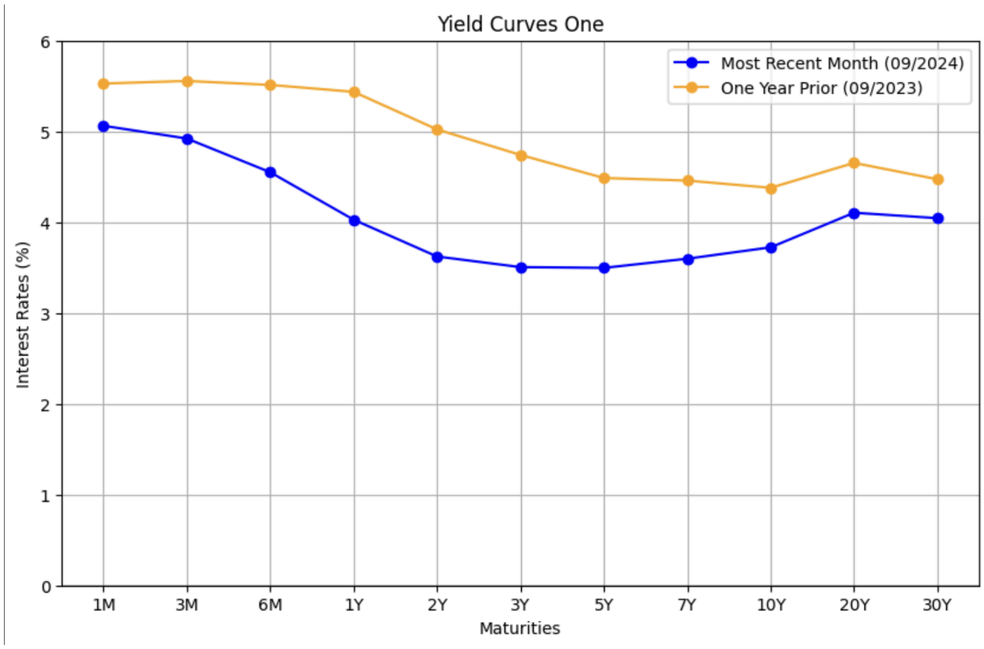
Project 2: Empirical Part

Question 1: During which periods of time was the 10-year interest rate higher than the 3-month interest rate? For consecutive months, your answer should be formed as “month/year to month/year”.

Answer: After crunching some numbers and plotting the data, it is clear that there are four intervals during which the 10-year interest rate surpassed the 3 month interest rate. These intervals are the following: January 2006 to July 2006, June 2007 to April 2019, October 2019 to January 2020, March 2020 to October 2022. Below is the graph to be able to visualize this. From the graph it is hard to distinguish the specific months as they are bunched together however, I thought it would only be right to include them all. It is still evident there are four clear parts when the blue line is above the orange one.



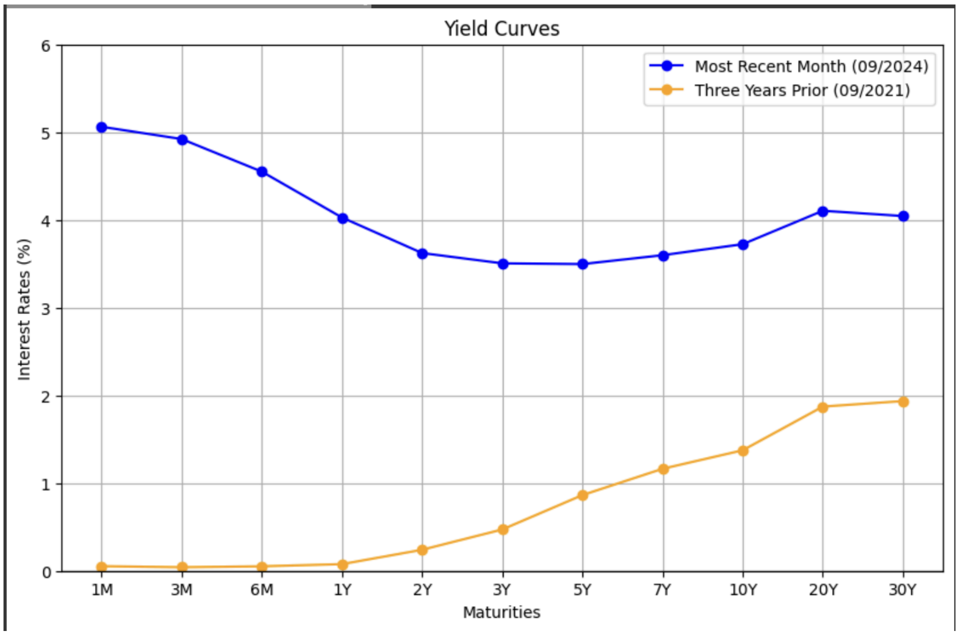
Question 2: Construct yield curves by creating a line graph for the most recent month of data available, and for the same month one year prior, across all the maturities. The graph needs to show maturities for the x-axis, interest rates for the y-axis, titled as "Yield Curves One", two lines with distinct colors, and legends of lines.



Question 3: Based on the graph in part (2), how do the yield curves compare? What is your best explanation for the difference between the 2 yield curves? (5 points)

Answer: Overall the first observation would be the clear overtake of the 2023 yield line across all maturities compared to 2024 yield line. We however can see that for shorter maturities 1-month and 3-month the difference is not that noticeable. As we move on to longer maturities times we can see a clearer difference between the two. While short-term rates remain relatively stable, the long term vision reflects growing concerns about our economic stability. In 2023 the 10 year bond had the lowest rate whereas in 2024 the 3 year bond had lowest rate. In 2024 there is growing concern about inflation thus investors would rather take lower rates reducing their risk with shorter bonds. In 2023, the 10-year bond had lowest return due to the FED's efforts through monetary policy targeting for stability in the economy after the pandemic being optimistic for overall growth in the future. Additionally, recently the FED lowered interest rate in 2024 which leads individuals to borrow more money. As borrowing goes up spending would also go up which can boost an economy. This would result in higher demand for all types of bonds leading to lower yields as we see with the blue line.

Question 4: Construct yield curves by creating a line graph for the most recent month of data available, and for the same month three years prior, across all the maturities. The graph needs to show maturities for the x-axis, interest rates for the y-axis, titled as "Yield Curves", two lines with distinct colors, and legends of lines.



Question 5: Based on the graph in part (4), how do the yield curves compare? What does the changing slope say about the market's expectation of potential changes in economic conditions?

Answer: Based on these two yield curves we can tell that in 2021 the rate for bonds was at an all time low across all bond maturities. This tells the opposite story to our graph with the 2024 and 2023 yield curves where 2024 was at bottom now it's on the top. A simple story for this would be the pandemic in 2021 where most people would prefer to lock in shorter maturity bonds. During uncertain times such as a pandemic, many people looking to invest take these shorter bonds which could be seen as cautious. As investors assess their positions and react to changing market conditions without locking their capital for risky extended periods of times. Starting at the 2-year maturity bond, we can see that rates have an upwards trend but still maintain low. This reflects compensation with higher yields as it is more uncertain what would happen in future based on the pandemic. Additionally, monetary policy in 2021 reduced interest rates by a lot to promote economic boost. These all time low interest rates increased demand for safe forms of investments thus the reason behind the dramatic decrease in yields.