Forecasting

DATA ANALYSIS IN EXCEL

Nick Edwards
Analyst at Mynd

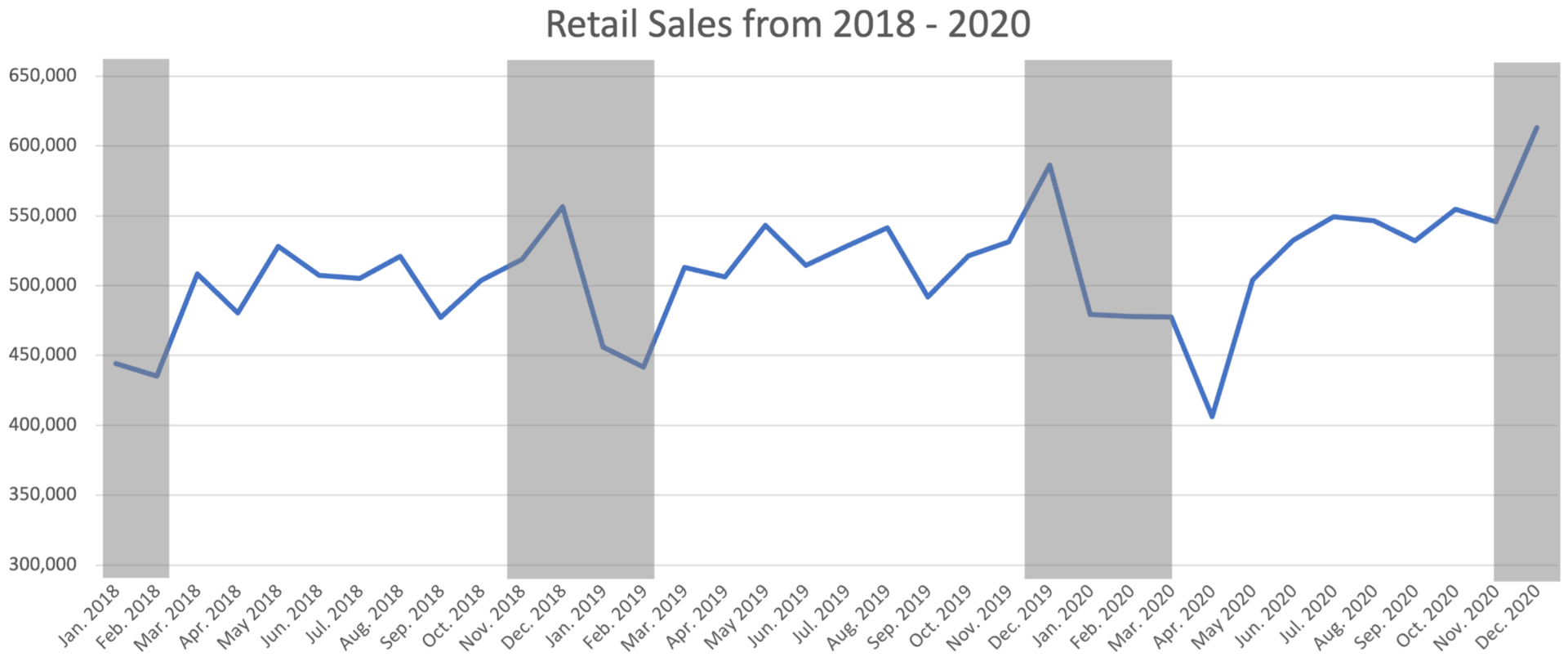
datacamp

What is forecasting?

- **Forecasting** is the process of predicting future outcomes and trends based on historical data using statistical techniques.
  - Forecasts are predictions **not** actual outcomes

Seasonality

- **Seasonality** is the correlation between the time of year and performance.



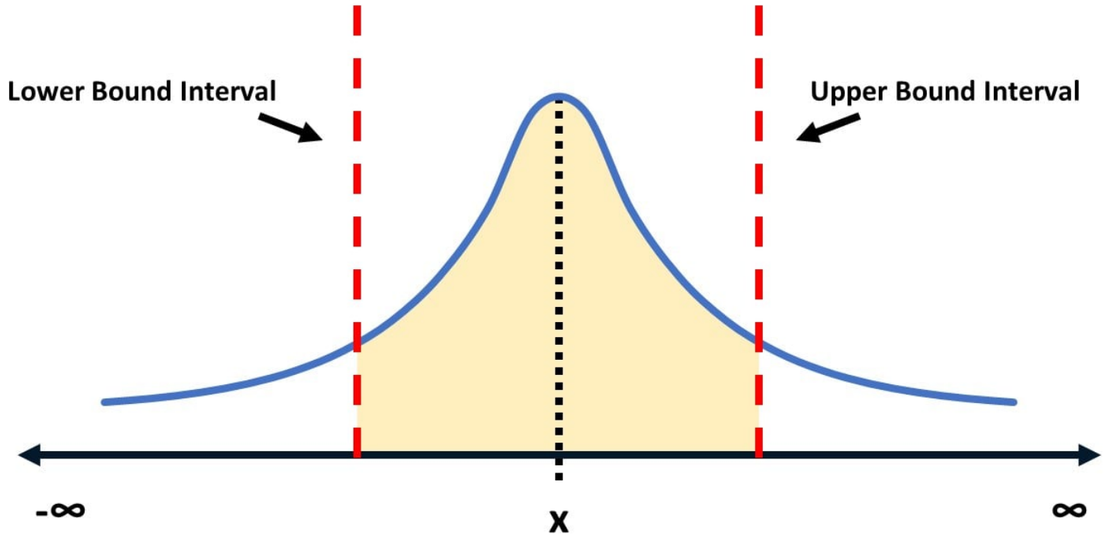
[1] https://www.census.gov/retail/sales.html

That's a bit biased...

Bias is the distortion of forecasting results from of the way the analysis was set up.

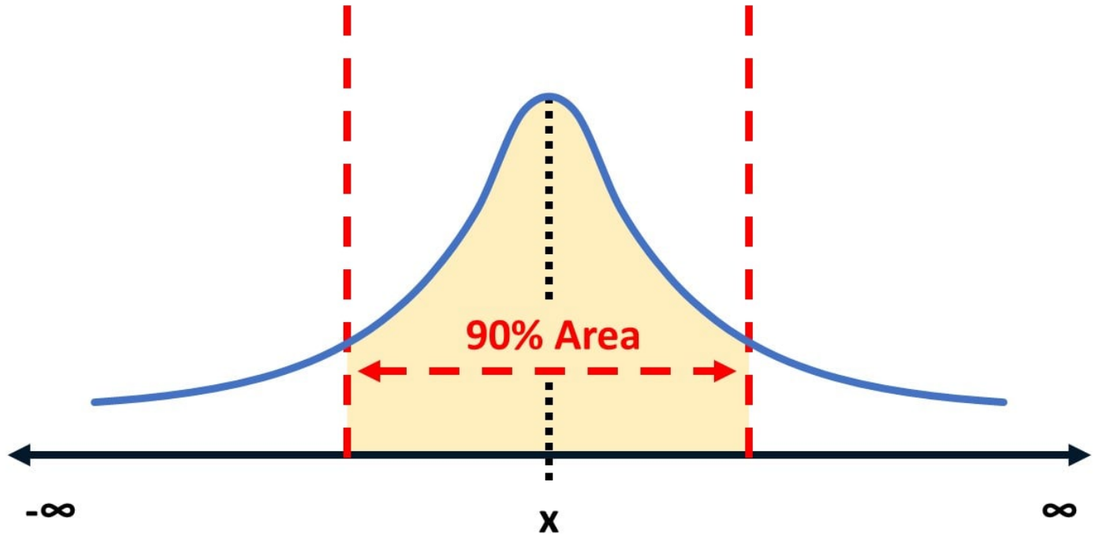
1. **Sampling bias:** data is collected in a way that is not representative
2. **Confirmation bias:** only accepting results that the analyst already believes to be true
3. **Anchoring bias:** failing to adjust adequately for new data or changing trends

Confidence intervals



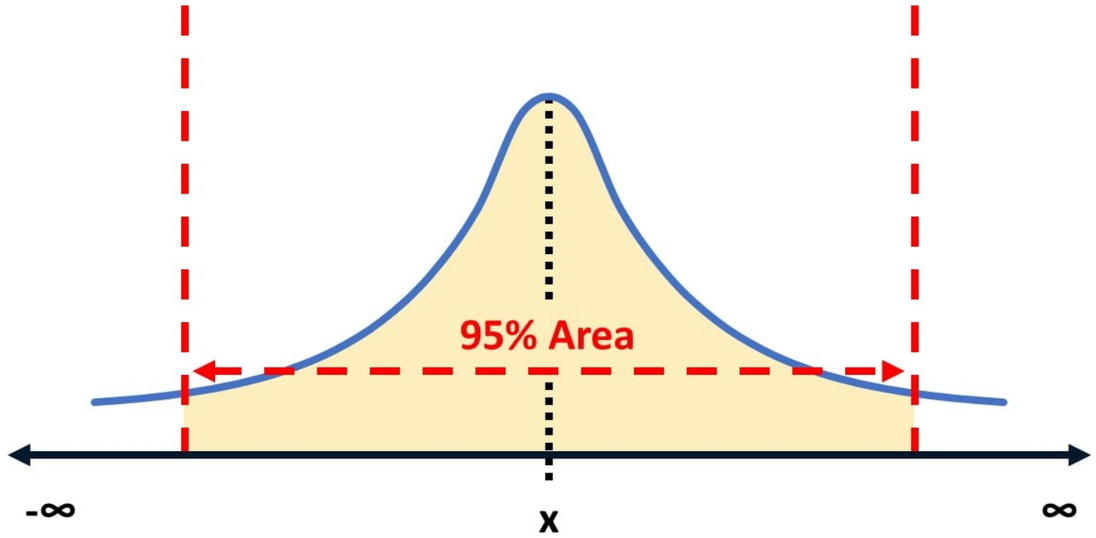
- **Confidence intervals** are the range within an actual outcome is likely to occur
- **Confidence level**: the probability an actual outcome is likely to fall within the intervals

Confidence intervals



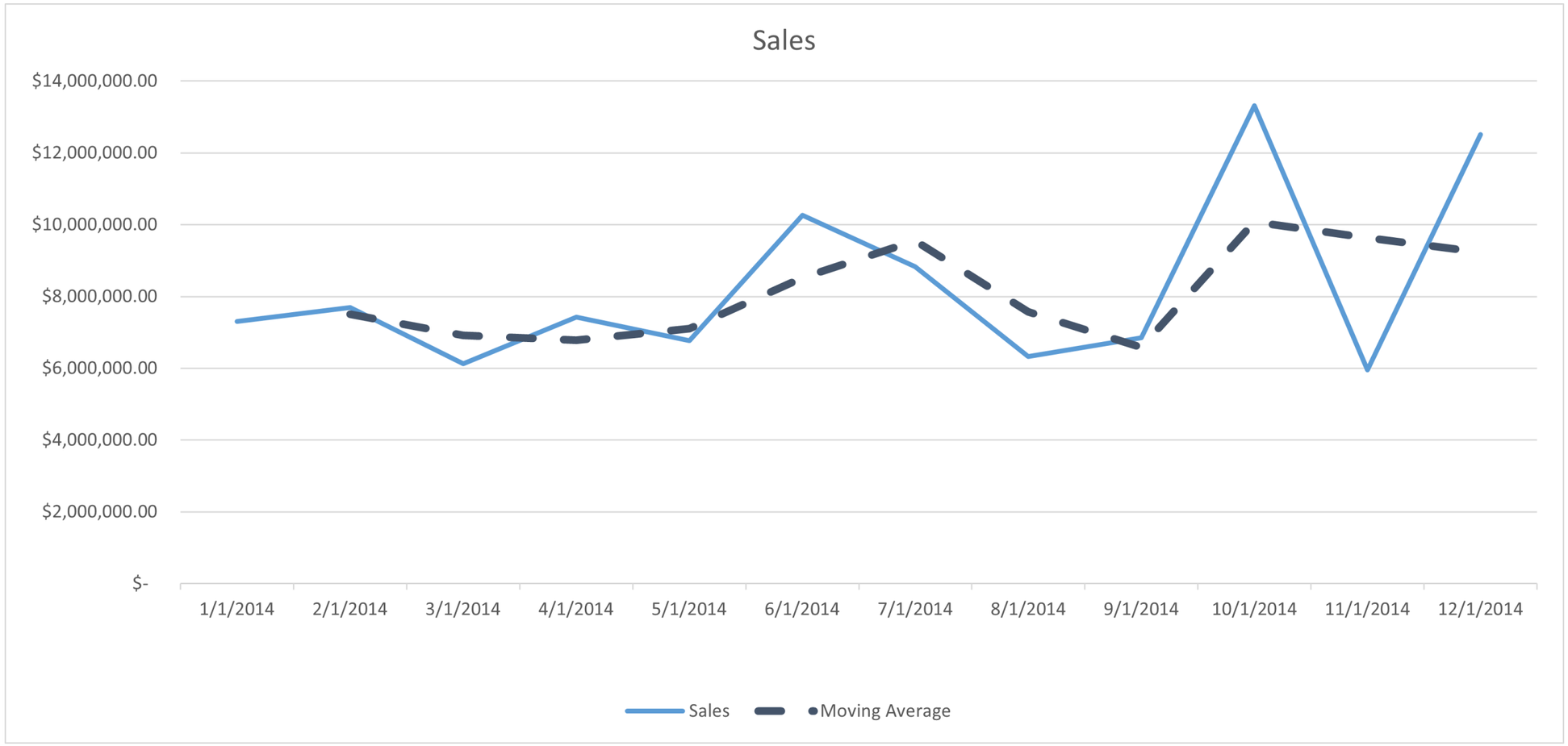
- **Confidence intervals** are the range within an actual outcome is likely to occur
- **Confidence level**: the probability an actual outcome is likely to fall within the intervals

Confidence intervals



- **Confidence intervals** are the range within an actual outcome is likely to occur
- **Confidence level**: the probability an actual outcome is likely to fall within the intervals

Moving averages



Weighted averages

Weighted moving average

- Multiplies the values in a data series by their assigned importance

$$WMA = \frac{\sum_{i=1}^{n} w_i X_i}{\sum_{i=1}^{n} w_i}$$

where:
x = value in period
w = weighted value
n = total variables

Weighted averages

Weighted moving average

- Multiplies the values in a data series by their assigned importance

$$WMA = \frac{\sum_{i=1}^{n} w_i X_i}{\sum_{i=1}^{n} w_i}$$

where:
x = value in period
w = weighted value
n = total variables

Example find the weighted average

Values	Weights
2	0.15
3	0.35
4	0.50

```
[(2 x 0.15) + (3 x 0.35) + (4 x 0.50)]/
(0.15 + 0.35 + 0.50)
```

```
3.6/1 = 3.6
```

Let's practice!

DATA ANALYSIS IN EXCEL

Forecasting techniques in Excel

DATA ANALYSIS IN EXCEL

Nick Edwards
Analyst at Mynd

Let's practice!

DATA ANALYSIS IN EXCEL

Congratulations!

DATA ANALYSIS IN EXCEL

Nick Edwards
Analyst at Mynd

Chapter 1: Exploring data with PivotTables

- You performed exploratory data analysis with PivotTables
- Created Calculated Columns
- Used grouping features to organize and segment data
- Added data and timeline slicers to filter data

Chapter 2: Intermediate logical functions

- Used logical functions like `SWITCH()`, `IF()`, `IFS()` and `CONCAT()`
- Created nested statements and customer segments
- Used logical aggregate functions like `SUMIF()` and `SUMIFS()`
- Created sales summaries for various customer groups
- Made comparisons and found insights into customer groups

Chapter 3: What if analysis

- Learned about the importance of asking what if
- Created scenarios for projected sales
- Used the Goal Seek, Scenario Manager and Data Table tools

Price Sensitivity

Supply \ Demand	1,000	2,000	3,000	4,000	5,000
1,000	$ 5.00	$ 10.00	$ 15.00	$ 20.00	$ 25.00
2,000	$ 2.50	$ 5.00	$ 7.50	$ 10.00	$ 12.50
3,000	$ 1.67	$ 3.33	$ 5.00	$ 6.67	$ 8.33
4,000	$ 1.25	$ 2.50	$ 3.75	$ 5.00	$ 6.25
5,000	$ 1.00	$ 2.00	$ 3.00	$ 4.00	$ 5.00

Chapter 4: Forecasting

- Used 5 different forecasting techniques:
  1. Simple moving average
  2. Weighted moving average
  3. Trendlines
  4. `FORECAST.ETS()` and `FORECAST.ETS.CONFINT()`
- Learned about the importance of confidence intervals and bias

Best of luck!

DATA ANALYSIS IN EXCEL