**DAX Formulas**

**Aggregation Functions**

1. **SUM**: Adds all numbers in a column.  
   Example: Total Sales = SUM(Sales[Amount])
2. **SUMX**: Sums an expression evaluated for each row.  
   Example: Total Revenue = SUMX(Sales, Sales[Quantity] \* Sales[Price])
3. **AVERAGE**: Calculates the average of a column’s values.  
   Example: Avg Accuracy = AVERAGE(Model[Accuracy])
4. **AVERAGEX**: Averages an expression evaluated for each row.  
   Example: Avg Price = AVERAGEX(Products, Products[Price] \* Products[Discount])
5. **COUNT**: Counts non-blank values in a column.  
   Example: Product Count = COUNT(Products[ProductID])
6. **COUNTROWS**: Counts the number of rows in a table.  
   Example: Row Count = COUNTROWS(Sales)
7. **DISTINCTCOUNT**: Counts unique values in a column.  
   Example: Unique Customers = DISTINCTCOUNT(Sales[CustomerID])
8. **MIN**: Returns the smallest value in a column.  
   Example: Min Loss = MIN(Model[Loss])
9. **MAX**: Returns the largest value in a column.  
   Example: Max Accuracy = MAX(Model[Accuracy])
10. **COUNTBLANK**: Counts blank values in a column.  
    Example: Missing Values = COUNTBLANK(Data[Feature])

**Filter Functions**

1. **CALCULATE**: Modifies filter context to evaluate an expression.  
   Example: Sales West = CALCULATE(SUM(Sales[Amount]), Sales[Region] = "West")
2. **FILTER**: Returns a table filtered by a condition.  
   Example: High Accuracy = CALCULATE(SUM(Model[Accuracy]), FILTER(Model, Model[Accuracy] > 0.9))
3. **ALL**: Removes filters from a table or column.  
   Example: Total Sales All = CALCULATE(SUM(Sales[Amount]), ALL(Sales[Region]))
4. **ALLEXCEPT**: Removes filters except for specified columns.  
   Example: Sales by Product = CALCULATE(SUM(Sales[Amount]), ALLEXCEPT(Sales, Sales[Product]))
5. **RELATED**: Retrieves a value from a related table.  
   Example: Product Name = RELATED(Products[Name])
6. **KEEPFILTERS**: Retains existing filter context while applying additional filters.  
   Example: Filtered Sales = CALCULATE(SUM(Sales[Amount]), KEEPFILTERS(Sales[Region] = "West"))
7. **ALLSELECTED**: Removes filters but respects slicers and user selections.  
   Example: Selected Sales = CALCULATE(SUM(Sales[Amount]), ALLSELECTED(Sales[Region]))
8. **EARLIER**: Refers to an earlier row context in nested calculations.  
   Example: Rank by Group = CALCULATE(COUNTROWS(Model), FILTER(Model, Model[Accuracy] > EARLIER(Model[Accuracy])))
9. **VALUES**: Returns a single-column table of unique values.  
   Example: Unique Regions = VALUES(Sales[Region])
10. **SELECTEDVALUE**: Returns the value of a column if a single value is selected.  
    Example: Selected Model = SELECTEDVALUE(Model[Name], "None")

**Date and Time Functions**

1. **DATEDIFF**: Calculates the difference between two dates.  
   Example: Days Since Training = DATEDIFF(Model[TrainDate], TODAY(), DAY)
2. **TODAY**: Returns the current date.  
   Example: Current Date = TODAY()
3. **CALENDAR**: Creates a table with a range of dates.  
   Example: Date Table = CALENDAR(DATE(2025, 1, 1), DATE(2025, 12, 31))
4. **TOTALYTD**: Calculates a year-to-date total.  
   Example: YTD Sales = TOTALYTD(SUM(Sales[Amount]), 'Date'[Date])
5. **SAMEPERIODLASTYEAR**: Returns data from the same period last year.  
   Example: Last Year Sales = CALCULATE(SUM(Sales[Amount]), SAMEPERIODLASTYEAR('Date'[Date]))
6. **DATESBETWEEN**: Returns a table of dates between two dates.  
   Example: Custom Range = CALCULATE(SUM(Sales[Amount]), DATESBETWEEN('Date'[Date], "2025-01-01", "2025-06-30"))
7. **NEXTDAY**: Returns the next day’s date.  
   Example: Next Training = NEXTDAY(Model[TrainDate])
8. **PREVIOUSDAY**: Returns the previous day’s date.  
   Example: Prev Day Accuracy = CALCULATE(SUM(Model[Accuracy]), PREVIOUSDAY('Date'[Date]))
9. **LASTDATE**: Returns the last date in the filter context.  
   Example: Latest Training = LASTDATE(Model[TrainDate])
10. **FIRSTDATE**: Returns the first date in the filter context.  
    Example: Earliest Training = FIRSTDATE(Model[TrainDate])
11. **ENDOFMONTH**: Returns the last date of the month.  
    Example: Month End = ENDOFMONTH('Date'[Date])
12. **STARTOFMONTH**: Returns the first date of the month.  
    Example: Month Start = STARTOFMONTH('Date'[Date])
13. **TOTALQTD**: Calculates a quarter-to-date total.  
    Example: QTD Accuracy = TOTALQTD(SUM(Model[Accuracy]), 'Date'[Date])
14. **TOTALMTD**: Calculates a month-to-date total.  
    Example: MTD Sales = TOTALMTD(SUM(Sales[Amount]), 'Date'[Date])
15. **DATEADD**: Shifts a date by a specified interval.  
    Example: Previous Month Sales = CALCULATE(SUM(Sales[Amount]), DATEADD('Date'[Date], -1, MONTH))
16. **PARALLELPERIOD**: Returns a table of dates from a parallel period.  
    Example: Last Year Period = CALCULATE(SUM(Sales[Amount]), PARALLELPERIOD('Date'[Date], -1, YEAR))
17. **PREVIOUSMONTH**: Returns data from the previous month.  
    Example: Prev Month Accuracy = CALCULATE(SUM(Model[Accuracy]), PREVIOUSMONTH('Date'[Date]))
18. **DATESYTD**: Returns a table of dates from the start of the year to the current date.  
    Example: YTD Accuracy = CALCULATE(SUM(Model[Accuracy]), DATESYTD('Date'[Date]))
19. **DATESINPERIOD**: Returns dates for a specified period ending at a date.  
    Example: Last 30 Days = CALCULATE(SUM(Sales[Amount]), DATESINPERIOD('Date'[Date], MAX('Date'[Date]), -30, DAY))

**Text and Lookup Functions**

1. **CONCATENATE**: Combines two text strings.  
   Example: Full Name = CONCATENATE(Customers[FirstName], " " & Customers[LastName])
2. **LEFT**: Returns the leftmost characters of a string.  
   Example: Product Code = LEFT(Products[ID], 3)
3. **RIGHT**: Returns the rightmost characters of a string.  
   Example: Year Code = RIGHT('Date'[Year], 2)
4. **FIND**: Returns the starting position of a text string within another.  
   Example: Model Code Pos = FIND("CNN", Model[Name], 1, 0)
5. **SEARCH**: Case-insensitive search for a text string’s position.  
   Example: Feature Search = SEARCH("Feature", Data[Description], 1, 0)
6. **LOOKUPVALUE**: Retrieves a value from a column based on a condition.  
   Example: Model Type = LOOKUPVALUE(Model[Type], Model[ID], Sales[ModelID])
7. **FORMAT**: Converts a value to a specified text format.  
   Example: Formatted Date = FORMAT('Date'[Date], "mm/dd/yyyy")
8. **TRIM**: Removes leading and trailing spaces from a text string.  
   Example: Clean Name = TRIM(Model[Name])
9. **SUBSTITUTE**: Replaces occurrences of a text string with another.  
   Example: Updated Name = SUBSTITUTE(Model[Name], "Old", "New")
10. **UPPER**: Converts a text string to uppercase.  
    Example: Uppercase Name = UPPER(Model[Name])
11. **LOWER**: Converts a text string to lowercase.  
    Example: Lowercase Name = LOWER(Model[Name])

**Logical and Conditional Functions**

1. **IF**: Returns one value if true, another if false.  
   Example: Performance = IF(Model[Accuracy] > 0.9, "High", "Low")
2. **IFERROR**: Returns a value if an expression errors.  
   Example: Safe Divide = IFERROR(DIVIDE(Sales[Amount], Sales[Quantity]), 0)
3. **SWITCH**: Evaluates an expression and returns values based on multiple conditions.  
   Example: Performance Level = SWITCH(TRUE(), Model[Accuracy] > 0.9, "High", Model[Accuracy] > 0.8, "Medium", "Low")
4. **BLANK**: Returns a blank value for use in calculations.  
   Example: Empty Value = IF(Model[Accuracy] = 0, BLANK(), Model[Accuracy])

**Statistical Functions**

1. **MEDIAN**: Returns the median value in a column.  
   Example: Median Accuracy = MEDIAN(Model[Accuracy])
2. **STDEV.P**: Calculates the population standard deviation of a column.  
   Example: Accuracy StdDev = STDEV.P(Model[Accuracy])
3. **STDEV.S**: Calculates the sample standard deviation of a column.  
   Example: Sample StdDev = STDEV.S(Model[Accuracy])
4. **VAR.P**: Calculates the population variance of a column.  
   Example: Accuracy Variance = VAR.P(Model[Accuracy])
5. **VAR.S**: Calculates the sample variance of a column.  
   Example: Sample Variance = VAR.S(Model[Accuracy])

**Ranking and Sorting Functions**

1. **RANKX**: Ranks values in a column or expression within a table.  
   Example: Model Rank = RANKX(ALL(Model), Model[Accuracy], , DESC)
2. **TOPN**: Returns the top N rows based on an expression.  
   Example: Top Models = CALCULATE(SUM(Model[Accuracy]), TOPN(5, Model, Model[Accuracy], DESC))
3. **RANK.EQ**: Assigns equal ranks to equal values in a column.  
   Example: Equal Rank = RANK.EQ(Model[Accuracy], Model[Accuracy], DESC)

**Mathematical Functions**

1. **ROUND**: Rounds a number to a specified number of digits.  
   Example: Rounded Accuracy = ROUND(Model[Accuracy], 2)
2. **DIVIDE**: Performs division and handles division by zero.  
   Example: Error Rate = DIVIDE(Model[Errors], Model[Total], 0)
3. **ABS**: Returns the absolute value of a number.  
   Example: Absolute Error = ABS(Model[Prediction] - Model[Actual])
4. **POWER**: Raises a number to a specified power.  
   Example: Squared Error = POWER(Model[Prediction] - Model[Actual], 2)
5. **SQRT**: Returns the square root of a number.  
   Example: RMSE = SQRT(AVERAGE(Model[SquaredError]))

**Information Functions**

1. **ISBLANK**: Checks if a value is blank and returns TRUE or FALSE.  
   Example: Missing Data = ISBLANK(Data[Feature])
2. **ISERROR**: Checks if an expression results in an error.  
   Example: Error Check = IF(ISERROR(DIVIDE(1, 0)), "Error", "Valid")
3. **CONTAINS**: Checks if a table contains a row matching criteria.  
   Example: Has High Accuracy = CONTAINS(Model, Model[Accuracy], 0.95)
4. **HASONEVALUE**: Returns TRUE if a column has exactly one value.  
   Example: Single Model = IF(HASONEVALUE(Model[Name]), SELECTEDVALUE(Model[Name]), "Multiple")

**Parent-Child Functions**

1. **PATH**: Returns a delimited text string of parent-child hierarchy IDs.  
   Example: Hierarchy Path = PATH(Employee[ID], Employee[ParentID])
2. **PATHITEM**: Returns a specific item from a parent-child hierarchy path.  
   Example: Manager ID = PATHITEM(PATH(Employee[ID], Employee[ParentID]), 2)
3. **PATHLENGTH**: Returns the number of levels in a parent-child hierarchy.  
   Example: Hierarchy Depth = PATHLENGTH(PATH(Employee[ID], Employee[ParentID]))