ALGORITHM Traffic\_Data\_Analysis

// Global Declarations

CONSTANTS:

MAX\_DAY = 31

MIN\_DAY = 1

MAX\_MONTH = 12

MIN\_MONTH = 1

MAX\_YEAR = 2024

MIN\_YEAR = 2000

// Input Validation Function

FUNCTION Validate\_Date\_Input(message, error\_message, max\_value, min\_value)

WHILE true DO

TRY

DISPLAY message

INPUT date\_input

IF date\_input < min\_value OR date\_input > max\_value THEN

DISPLAY error\_message

CONTINUE

IF length(date\_input) == 1 THEN

date\_input = "0" + date\_input

RETURN date\_input

EXCEPT ValueError

DISPLAY "Integer required"

END TRY

END WHILE

END FUNCTION

// Continue Input Validation Function

FUNCTION Validate\_Continue\_Input()

WHILE true DO

DISPLAY "Do you want to select another data file? Y/N > "

INPUT user\_continue

SWITCH user\_continue

CASE "Y", "y":

RETURN TRUE

CASE "N", "n":

DISPLAY "End of run"

RETURN FALSE

DEFAULT:

DISPLAY "Please enter Y or N"

END SWITCH

END WHILE

END FUNCTION

// Data Processing Function

FUNCTION Process\_CSV\_Data(file\_path)

INITIALIZE traffic\_data\_list = ARRAY(16 zeros)

traffic\_data\_list[0] = file\_path

TRY

OPEN file\_path

READ all\_rows

REMOVE header\_row

// Initialize tracking variables

INITIALIZE:

total\_vehicles = 0

truck\_count = 0

electric\_vehicles = 0

two\_wheeled\_vehicles = 0

// Other necessary tracking variables

FOR EACH row IN all\_rows DO

// Detailed data processing logic

// Increment appropriate counters

// Calculate percentages

// Track vehicle types, speeds, junctions

// Weather condition analysis

END FOR

CALCULATE derived\_metrics

RETURN traffic\_data\_list

EXCEPT FileNotFoundError

DISPLAY "File not found"

RETURN NULL

END TRY

END FUNCTION

// Results Display Function

FUNCTION Display\_Outcomes(outcomes)

INITIALIZE results\_list = EMPTY\_LIST

// Format and add detailed metrics to results

APPEND results\_list with formatted metrics

DISPLAY all results

RETURN results\_list

END FUNCTION

// File Saving Function

FUNCTION Save\_Results\_To\_File(outcomes, filename = "results.txt")

OPEN filename IN APPEND\_MODE

FOR EACH result IN outcomes DO

WRITE result TO file

END FOR

CLOSE file

END FUNCTION

// Main Program Flow

FUNCTION Main()

WHILE true DO

// Date Input Phase

day = Validate\_Date\_Input(

"Enter day",

"Day out of range",

MAX\_DAY,

MIN\_DAY

)

month = Validate\_Date\_Input(

"Enter month",

"Month out of range",

MAX\_MONTH,

MIN\_MONTH

)

year = Validate\_Date\_Input(

"Enter year",

"Year out of range",

MAX\_YEAR,

MIN\_YEAR

)

// Construct filename

filename = CONCATENATE("traffic\_data", day, month, year, ".csv")

// Process Data

traffic\_data = Process\_CSV\_Data(filename)

IF traffic\_data IS NULL THEN

continue\_option = Validate\_Continue\_Input()

IF NOT continue\_option THEN

BREAK

END IF

END IF

// Display Results

results = Display\_Outcomes(traffic\_data)

// Save Results

Save\_Results\_To\_File(results)

// Ask to Continue

continue\_option = Validate\_Continue\_Input()

IF NOT continue\_option THEN

BREAK

END IF

END WHILE

END FUNCTION

// Program Execution

CALL Main()

END ALGORITHM