Imports and Dependencies:

- csv for reading CSV files
- std::error::Error for handling potential errors
- rand libraries for randomizing data

Individual Struct Definition:

- This defines a struct representing an individual's career data:
    - #[derive(Debug, Clone)] allows printing and cloning of the struct
    - Each field represents a different aspect of a person's career
    - All fields are floating-point numbers for flexibility in analysis
        - Except family_influence

read_dataset Function:

- Reads a CSV file
- Creates an empty vector to store individuals
- Sets up a CSV reader
- Limits reading to 20,000 records
- Tracks parsing errors
- Parses each CSV record
- Converts string values to numeric types
- Handles family influence as a categorical variable
- Creates Individual structs from parsed data
- Tracks and reports parsing errors

calculate_linear_regression Function:

- Ensures input vectors are the same length
- Calculates means of x and y vectors
- Computes slope, intercept, correlation, and R-squared values manually

perform_salary_correlation_analysis Function:

- Creates pairs of data to analyze against salary
- Extracts specific attributes from individuals
- Performs linear regression for each pair
- Prints correlation results with interpretation

print_sample_verification Function:

- Prints basic statistics about the data sample
- Calculates distribution of various attributes
- Prints first and last 10 records for verification

main Function:

- Reads the dataset
- Shuffles the data randomly
- Takes a sample of 2,000 records

- Prints sample verification
- Performs salary correlation analysis

#[cfg(test)] ensures these tests only compile during testing

- Linear Regression Test:
    - Uses a perfect linear dataset (y = 2x)
    - Checks if linear regression calculations are correct
    - Verifies slope, intercept, correlation, and R-squared
    - Uses assert! with a small tolerance for floating-point comparisons
- Error Handling Test:
    - Checks error handling for mismatched input vector lengths
    - #[should_panic] expects the function to panic with a specific message
    - Tries to run linear regression with unequal-length vectors
- Individual Struct Creation Test:
    - Creates an Individual struct
    - Verifies that struct fields are set correctly
    - Uses assert_eq! to check specific values
- Family Influence Parsing Test:
    - Checks parsing of family influence categorical values
    - Uses a vector of test cases
    - Verifies each input maps to the correct numeric value
    - Handles different categorical inputs
- CSV Dataset Reading Test:
    - Creates an in-memory CSV dataset
    - Uses Cursor to simulate a file reader
    - Parses the small dataset into Individual structs
    - Verifies correct parsing of records
    - Checks specific values in parsed individuals
- Print Statistics Test:
    - Uses a predefined dataset
    - Calculates mean, minimum, and maximum
    - Verifies statistical calculations
    - Uses floating-point comparison with small tolerance