**Use Case 1**: Generate Country Population Report

**Use Case Element**: Description

**Use Case Title**: Generate Country Population Report

**Actors User** (Admin/Analyst)

**Preconditions**: System is running and networked to the database.

**Trigger:** User selects "Country Population Report" from the menu.

### Main Flow

* System requests filter (World, Continent, Region).
* User selects a filter.
* System reads and lists countries ordered by population.
* System displays the result in a table (Code, Name, Continent, Region, Population, Capital).

### Alternative Flows

* If no filter is selected, show all countries.
* If no data exists, show "No data available" message.

### Postconditions

* Report is shown or ready to export.

### Expected Outcome

* User sees population of countries by selected filter.

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**Use Case 2**: Generate City Population Report

**Use Case Element**: Description

**Use Case Title**: Generate City Population Report

**Actors**: User

**Preconditions**: System is online and running.

**Trigger**: User selects "City Population Report".

### Main Flow

* System prompts user to select filter (World, Continent, Region, Country, District).
* User chooses.
* System requests cities and sorts by population.
* Report displayed with columns: Name, Country, District, Population.

### Alternative Flows

* In case of invalid input, system prompts user to try again.

### Postconditions

* Sorted list of cities is displayed.

### Expected Outcome

* Correct city population report according to user selection.

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**Use Case 3**: Generate Top N Populated Cities

**Use Case Element**: Description

**Use Case Title**: Generate Top N Populated Cities

**Actors**: User

**Preconditions**: System is ready, and database is available.

**Trigger**: User selects "Top N Cities" from choices.

### Main Flow

* Ask user to enter number N and location filter (World, Continent, Country, Region).
* User enters values.
* System queries and fetches top N populated cities in specified region.
* Results are displayed in descending order.

Alternative Flows

* N is not a number or negative, system prompts again.

### Postconditions

* Valid top- N list is displayed.

Expected Outcome

* User sees top N cities by population and filters.

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**Use Case 4**: View Language Speaker Statistics

**Use Case Element**: Description

**Use Case Title**: View Language Speaker Statistics

**Actors**: User

**Preconditions**: System is running, and language data is present.

**Trigger**: User selects "Language Statistics" report.

### Main Flow

* System loads # of speakers for: Chinese, English, Hindi, Spanish, Arabic.
* System calculates % of world pop for each.
* Results are sorted by # of speakers.
* Report is presented.

### Alternative Flows

* If there is no language data available, system notifies user.

### Postconditions

* Percentages and language data are shown.

### Expected Outcome

* User is given speaker counts and world percentage for each language.

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**Use Case 5:** Compare Urban vs Rural Population

**Use Case Element**: Description

**Use Case Title**: Compare Urban vs Rural Population

**Actors**: User

**Preconditions:** Available city population data.

**Trigger**: User selects "Urban vs Rural" from the menu.

### Main Flow

* User selects area: Continent, Region, Country.
* System retrieves total population for selected area.
* System calculates urban population (total of city populations).
* Rural population = Total - Urban.
* % of each is calculated.
* Report is shown.

### Alternative Flows

* If no cities, system indicates 0% urban population.

### Postconditions

* Breakdown is shown to user.

### Expected Outcome

* User is displayed urban vs rural split with % values.