**953212 DB SYS & DB SYS DESIGN**

**(Lab2) Data Manipulation with Java**

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In this lab 2, you are going to apply your programming skills, including data structure, OOP, and problem-solving, to answer the following inquiries. You can start your project from your previous lab solution.

**Part 1) Basic data manipulation**

1. **(Easy Mode)** (1 point) Extend your Main class, so that you have another function (e.g., tolowercase) to convert all the university names to lower case.
2. **(Easy Mode)** (1 point) Replace the university scores that are empty or don't have values with "0" for all score fields:
   * Academic Reputation Score
   * Employer Reputation Score
   * Faculty Student Score
   * Citations per Faculty Score
   * International Faculty Score
   * International Students Score
   * International Research Network Score
   * Employment Outcomes Score
   * Sustainability Score
   * Overall SCORE
3. **(Medium Mode)** (1 point) Round all the university scores (e.g., 93.6 -> 94, 87.3 -> 87) for all numeric score fields listed above.
4. **(HARD MODE)** (1 point) Remove universities that have rank ranges (e.g., "501-510", "601-610") from the list, keeping only universities with specific numeric ranks (e.g., "1", "2", "15").

**Part 2) Sorting array of objects**

1. **(Medium Mode)** (1 point) Apply Comparable to the data model, and sort the data by Institution Name from the Main class. Hints: Use class UniData implements Comparable<UniData> and implement public int compareTo(UniData x)
2. **(Medium Mode)** (1 point) Save the output of sorted university names after applying all manipulations from Part 1 and Part 2 in a new CSV file namely, "QS-World-University-Rankings-2024\_updated.csv"

**Submission**

Submit your Java source code Main.java, UniData.java to Mango system under Lab2.

*Note*: HARD MODE means it will take you probably some time to make perfect results.