



VISUAL ANALYTICS - HOMEWORK I

FRANCESCO FORTUNATO - I848527



COLLECT ALL THE SCORES OF BACHELOR EXAMS

Exam Number	Exam Code	Name	Date	Grade	Credits
1	101204	GEOMETRY	18/02/2019	19	6
2	1056025	PROGRAMMING TECHNIQUES	12/06/2019	27	9
3	1017218	MATHEMATICAL ANALYSIS I	11/02/2020	24	12
4	1018706	SOFTWARE DESIGN	12/02/2020	18	9
5	1056029	COMPUTING SYSTEMS	12/06/2020	29	9
6	1017219	MATHEMATICAL ANALYSIS II	22/06/2020	19	6
7	1017400	PHYSICS	15/07/2020	24	12
8	1017398	BUSINESS ECONOMICS AND ORGANIZATION	13/01/2021	23	9
9	1041469	FUNCTIONAL AND PARALLEL PROGRAMMING	17/01/2021	30	6
10	1015392	TELECOMMUNICATIONS	25/01/2021	30	9
11	1021946	AUTOMATIC CONTROLS	14/06/2021	25	9
12	1018745	COMPUTER NETWORKS	09/07/2021	27	6
13	1018733	PROBABILITY CALCULUS AND STATISTICS	21/07/2021	19	6
14	1022563	OPERATIVE SYSTEMS	18/01/2022	28	6
15	1056030	COMPUTING SYSTEMS II	26/01/2022	30	6
16	1016596	ELECTRONICS	06/06/2022	28	6
17	1056028	SYSTEM THEORY	21/06/2022	26	9

TEMPORAL DISTRIBUTION

Data Classification

- **Data Types:** Numerical (exam scores), Time Series (dates).
- **Relationships:** Temporal distribution of exam scores.

Visual Variables

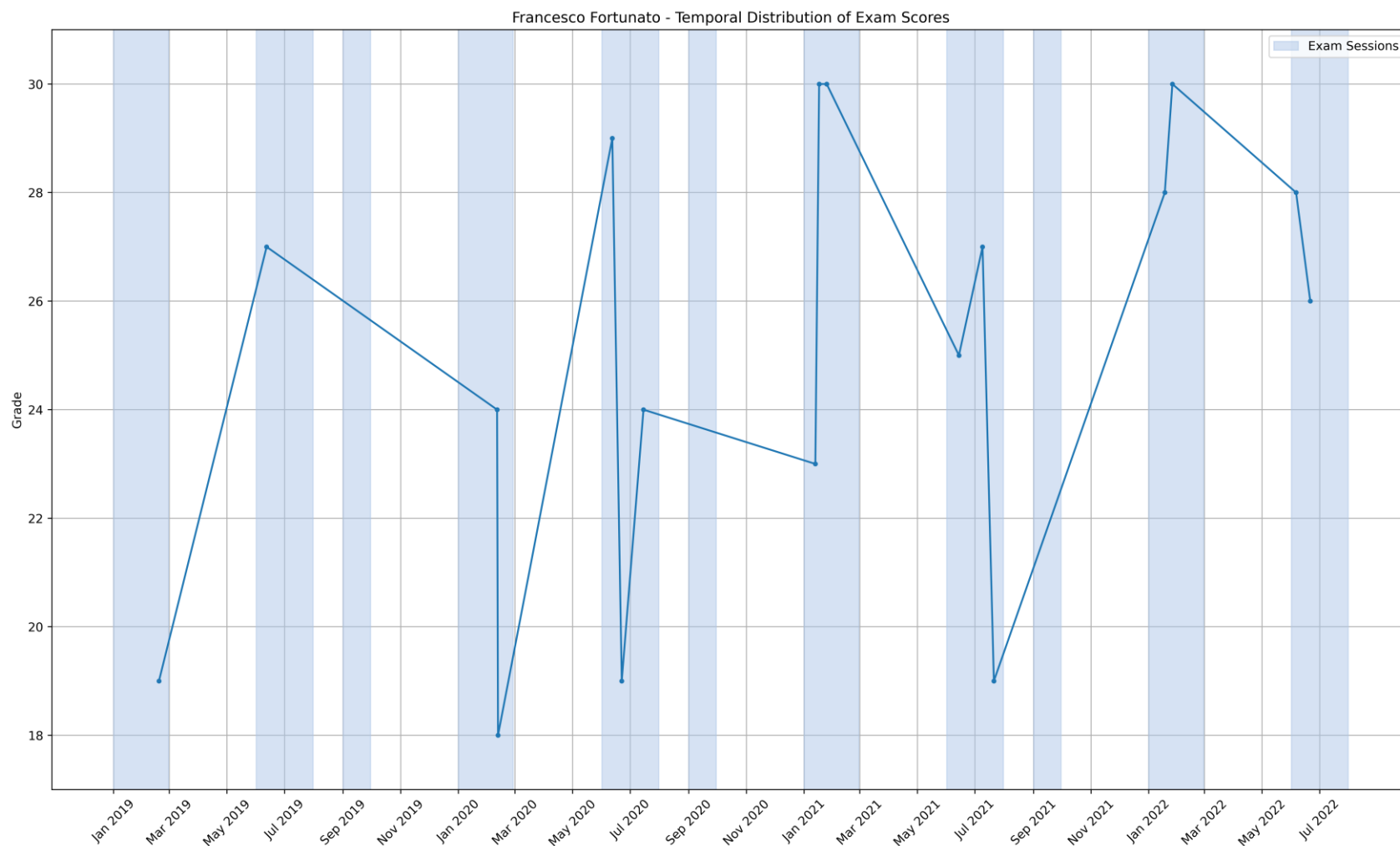
- **X-axis:** Time (Jan 2019 - Aug 2022).
- **Y-axis:** Exam Scores (18-30).
- **Line and markers:** temporal distribution

Plot Description

- The plot shows the temporal distribution of exam scores over time.
- Each data point represents an exam score.
- **Shaded regions** indicate exam sessions in January/February, June/July, and September.
- X-tick labels are formatted as 'Month Year' for clarity.

Analysis

- The scores fluctuate very much over time
- Over time, academic performance shifted: In the first half (before 2021), three exams scored under 22 and only one over 28. In the second half (from 2021 onward), just one scored under 22, while five exceeded 28.



LOCAL AND GLOBAL PERFORMANCE

Data Classification

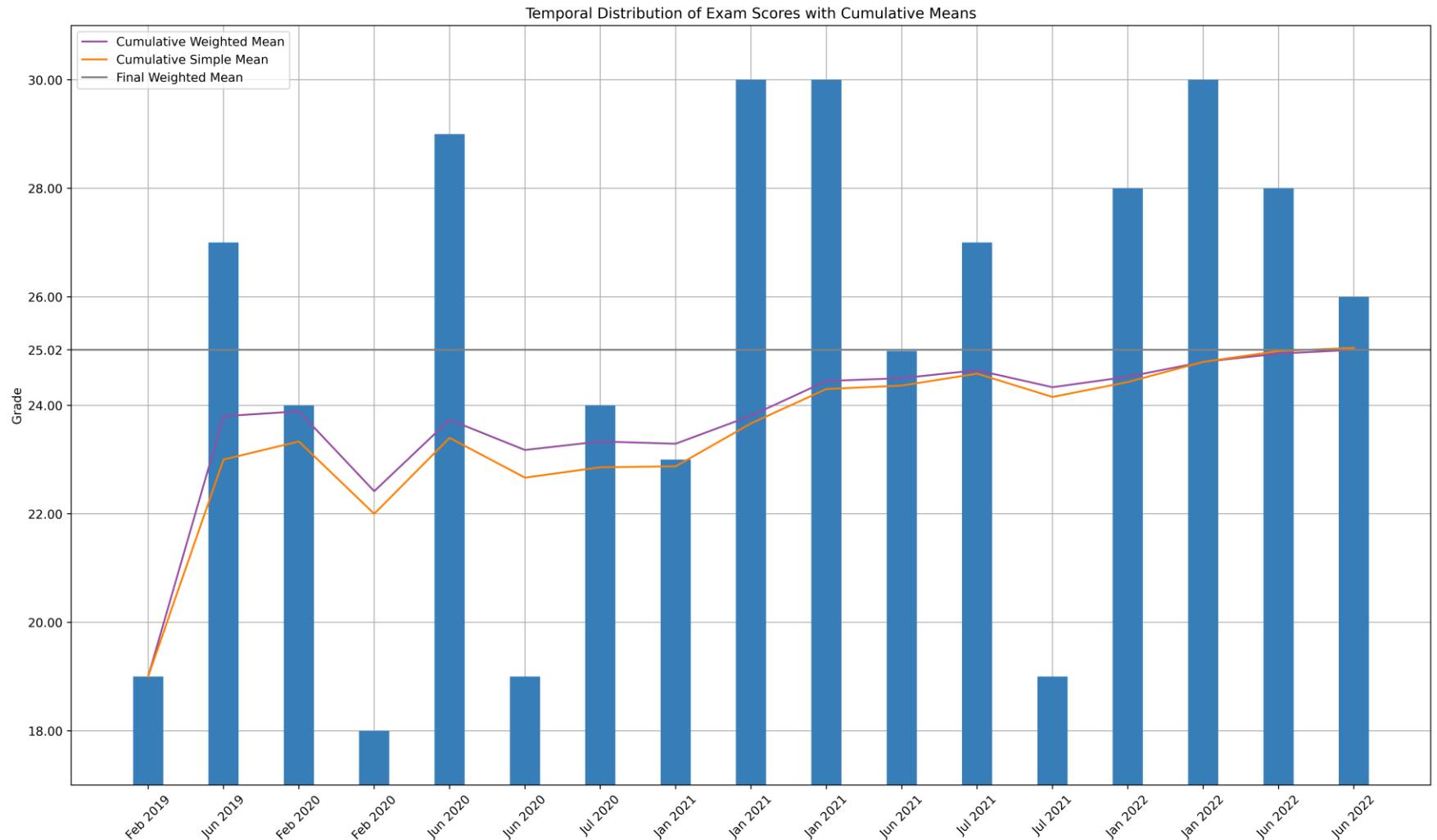
- **Data Types:** Numerical (exam scores, credits), Time Series (dates)
- **Relationships:** distribution of exam scores and cumulative performance.
- **Quantitative Variables:** Exam scores, cumulative mean, cumulative weighted mean.

Visual Variables

- **X-axis:** Time (Jan 2019 - Aug 2022).
- **Y-axis:** Exam Scores (18-30).
- **Bars:** Exam scores.
- **Lines:** Cumulative Weighted Mean and Cumulative Simple Mean.

Plot Description and Analysis

- The plot shows the local and global performance of exam scores over time.
- Each bar represents exam scores at a session.
- Lines indicate Cumulative Weighted Mean and Cumulative Simple Mean and final Weighted Mean.
- We can see the important improvement over the time, along with the difference between simple and average means.



INDIVIDUAL LOCAL AND GLOBAL PERFORMANCE

Data Classification

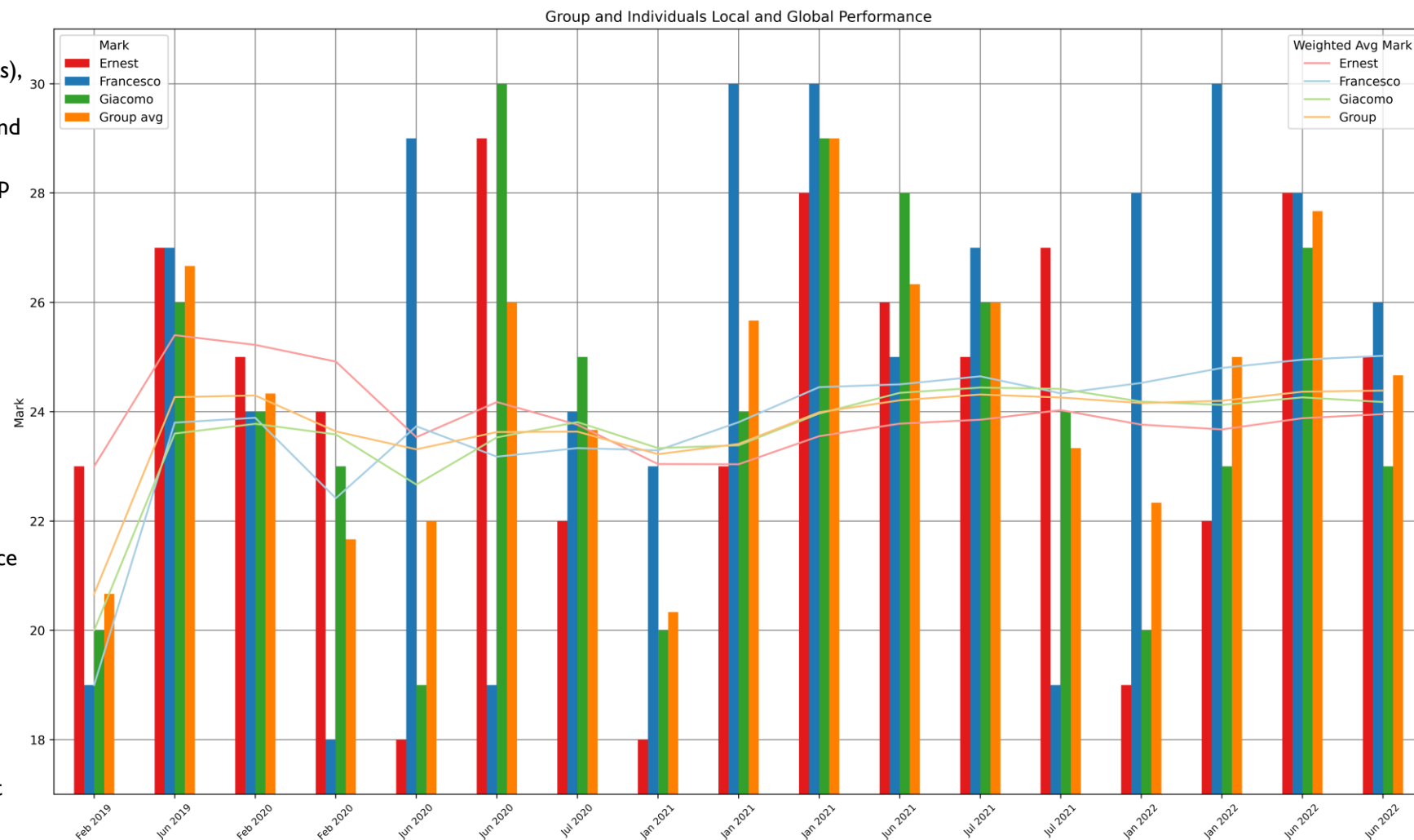
- **Data Types:** Numerical (exam scores, credits), Time Series (dates)
- **Relationships:** distribution of exam scores and cumulative performance.
- **Quantitative Variables:** Exam scores, group mean, cumulative means, cumulative weighted means.

Visual Variables

- **X-axis:** Time (Jan 2019 - Aug 2022).
- **Y-axis:** Exam Scores (18-30).
- **Bars:** Exam scores.
- **Lines:** Cumulative Weighted Mean and Cumulative Simple Mean.
- **Colors:** Different colors for each person.

Plot Description and Analysis

- The plot displays the local performance of individuals in exams over time.
- Each bar represents an individual's performance on different exams.
- Cumulative Weighted Mean lines show performance trends for each person.
- We can see important variations between individuals over the time, along with the difference between average means. We can clearly observe exams where individuals have similar marks, as well as exams with significant differences in their scores.



A DIFFERENT VIEW: BOX PLOT AND SCATTER PLOT

Box Plot

Data Classification

- Data Types: Numerical (exam scores), Categorical (persons).
- Relationships: Comparison of exam scores.

Visual Variables

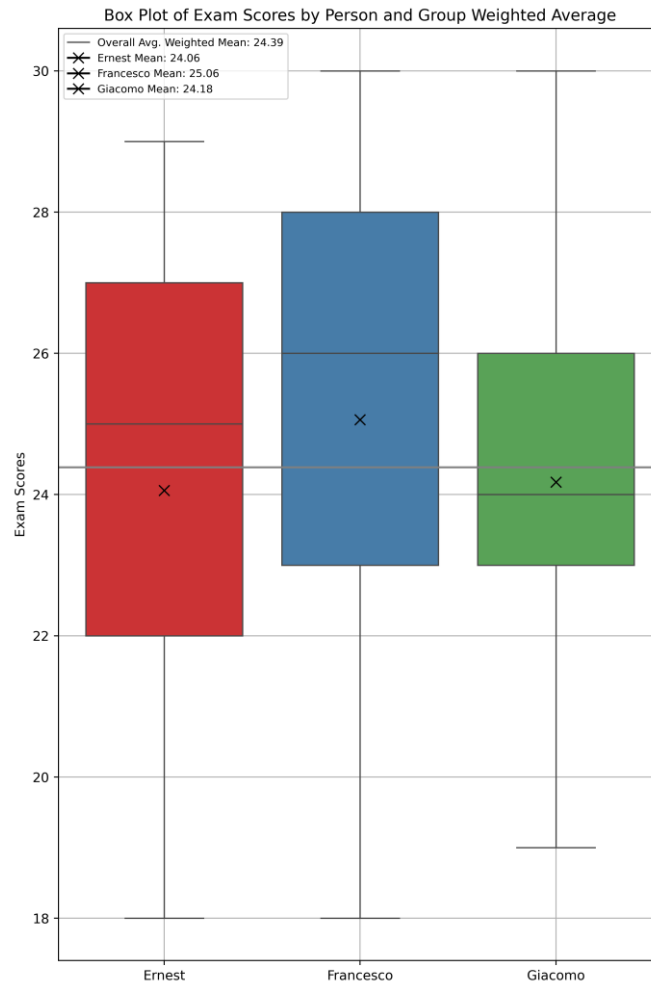
- X-axis: Person.
- Y-axis: Exam Scores.

Plot Description

- The box plot shows the distribution of exam scores for different individuals.
- It provides insights into score variations among individuals.

Analysis

- The plot helps identify variations in exam scores.
- It allows comparisons of exam performance between individuals.



Scatter Plot

Data Classification

- Data Types: Numerical (exam scores), Categorical (persons).
- Relationships: Comparison of individual and group performance.

Visual Variables:

- X-axis: Person.
- Y-axis: Exam Scores.
- Marker Size: Exam Count.

Plot Description:

- The scatter plot compares individual exam scores with group performance.
- Marker size represents the count of exams.

Analysis:

- It helps understand how individuals perform compared to the group.
- Exam count aids in recognizing prolific performers.

