# **BUSINESS ANALYTICS CASE COMPETITION – 2024**

## **<TEAM NAME>**

**Member 1:**

**Name:**

**Email:**

**Member 2:**

**Name:**

**Email:**

**Member 3: (If any)**

**Name:**

**Email:**

**Member 4: (if any)**

**Name:**

**Email:**

# **INSTRUCTIONS**

* To answer the following questions, use the three files provided (**fig\_4.2.18.csv**, **fig\_4.2.13.csv**, **IMF-WEO.xlsx**).
* The data in files fig\_4.2.18 and fig\_4.2.18.csv is compiled and shared by Stanford University ([AI Index Report | Stanford HAI](https://hai.stanford.edu/research/ai-index-report)).The data in file IMF-WEO.xlsx is sourced from International Monetary Fund (https://www.imf.org/en/Publications/WEO)
* The questions contain more information about the variables to use from the above datasets.
* You can use any other freely available data on country indicators (e.g., from the World Bank, IMF, etc.) to answer the questions, but it is not required, and provided data should be sufficient.
* Answer as many questions as possible in this report to the best of your ability. You can use as much space in this document as you want to answer the questions.
* You can use any software tool to analyze the data.
* Teams must also upload the application programs, files, and other supplementary materials used to answer the questions in this competition.
* Report submission link: [**https://wmich.co1.qualtrics.com/jfe/form/SV\_2nvW4hfh4wDnNXw**](https://wmich.co1.qualtrics.com/jfe/form/SV_2nvW4hfh4wDnNXw)
* Recommended answering format. Teams can break down their answers into the following sections.
* *Data Preprocessing:* This represents the data cleaning, transformation, or merging exercise you must undertake to answer the questions. Highlight any new column created or values ignored in the analysis.
* *Variables / Columns and Software Tools Used: Mention the dataset and the variables that have been used to answer the question. Also, write the software tool (e.g., Excel, Power BI, Python etc.) used to answer the question. You can also discuss any new columns created to answer the question here.*
* *Analysis and Findings: Briefly describe the approach to answer the question and summarize your findings. Here, you can write arguments in support of your answer. You can paste your plot and briefly describe it. Also, discuss the outcomes of metrics like correlation coefficients, standard deviation, mean etc. you have used to answer the question.*
* *Limitations / Caveats (if any): If your analysis has any limitations or caveats, you can highlight them here. For example, you can come up with a statement as more information is required to conclude or the data has bias.*
* *Each team participating in this competition should adhere to the WMU academic conduct code. More information here:*

[Expectations of Students | Student Conduct | Western Michigan University (wmich.edu)](https://wmich.edu/conduct/expectations-students)

* By participating in the competition, the teams permit the organizers to use the submitted materials for promotion or other purposes.
* The datasets used in this competition are from third-party sources and may have been modified for this competition. Participants are requested to take permission from and cite the appropriate third-party data source for using the datasets outside of this competition.

# ATTEMPT MATRIX

**Highlight the questions completed in this report below**

**Note: you can submit the report even if you cannot complete all questions. Winners will be based on the performance of all teams.**

|  |  |
| --- | --- |
| **Question** | **Attempt (Yes / No)** |
| Question 1 |  |
| Question 2 |  |
| Question 3 |  |
| Question 4 |  |
| Question 5 |  |

**Rubric (To be completed by evaluators):**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Question** | **Data Preparation**  **(20)** | **Analysis**  **(20)** | **Interpretation**  **(20)** | **Writing / Presentation**  **(40)** | **Total Score**  **(100)** |
| Question 1 |  |  |  |  |  |
| Question 2 |  |  |  |  |  |
| Question 3 |  |  |  |  |  |
| Question 4 |  |  |  |  |  |
| Question 5 |  |  |  |  |  |
| **Total Score (out of 500)** | | | | |  |

## Question 1 (AI talent growth)

The **fig\_4.2.18.csv** dataset has information on AL talent concentration information for 28 countries since 2016. Project which country is expected to first reach AI talent concentration of 2% for both Male and Female and by which year. Clearly include the methodology used to make the projections (as there can be many). More information about the data can be found in Figure 4.2.18 of the “Artificial Intelligence Index Report 2024” report. The report publisher also provides the data.

Link to report: [HAI\_AI-Index-Report-2024.pdf (stanford.edu)](https://aiindex.stanford.edu/wp-content/uploads/2024/05/HAI_AI-Index-Report-2024.pdf)

\*Note: Your answers to any question can span multiple pages of this document.

**Answer:**

## Question 2 (COVID disruption in AI hiring)

The data in the file **fig.4.2.13.csv** contains “Relative AI hiring rate year-over-year ratio by geographic area, 2018–23” for 28 countries (see page 233 of the “[Artificial Intelligence Index Report 2024](https://aiindex.stanford.edu/wp-content/uploads/2024/05/HAI_AI-Index-Report-2024.pdf)”). Assuming 2020, 2021 and 2022 were the years of COVID19 disruption. Find out what was the impact of COVID19 on Relative AI hiring rate year-over-year ratio across the globe. Try to provide a metric that can summarize the impact. Keep an open mind, as there are several ways to answer this question. Describe our approach and findings. Do highlight your data cleaning or preprocessing steps in your answer. (use as much space as you want)

**Answer:**

## Question 3 (Associations in AI hiring)

The data in the file **fig.4.2.13.csv** contains “Relative AI hiring rate year-over-year ratio by geographic area, 2018–23” for 28 countries (see page 233 of the “[Artificial Intelligence Index Report 2024](https://aiindex.stanford.edu/wp-content/uploads/2024/05/HAI_AI-Index-Report-2024.pdf)”). Which two countries have the strongest and weakest association between Relative AI hiring rates shown in the data? Describe your approach, any data processing steps, and the outcome.

**Answer:**

## Question 4 (AI-related hiring and Unemployment)

The data in the file **fig.4.2.13.xlsx** contains “Relative AI hiring rate year-over-year ratio by geographic area, 2018–23” for 28 countries (see page 233 of the “[Artificial Intelligence Index Report 2024](https://aiindex.stanford.edu/wp-content/uploads/2024/05/HAI_AI-Index-Report-2024.pdf)”).The file **IMF-WEO.xlsx** contains information on a country's unemployment rate (select indicator IMF.WEO.LUR). Note that you do not have either info for all the countries over all years, and the Relative AI hiring rate is measured monthly while the unemployment rate is annual. Based on the available information discuss if there is an association between the Relative AI hiring rate and unemployment rate in a country. Describe your approach to data preparation, methods used, and outcomes.

**Answer:**

## Question 5 (Gender-specific AI hiring and unemployment)

The **fig\_4.2.18** dataset has information on AI talent concentration information for 28 countries since 2016. The file **IMF-WEO.xlsx** contains information on a country's unemployment rate (see indicator IMF.WEO.LUR). Investigate if there is any substantial relationship between Male or Female AI talent concentration and a country's unemployment rate by answering the following questions.

1. Discuss the average change in a country's unemployment rate if the male or female AI talent concentration increases by 1% in any country.
2. Develop a graph or visual that showcases a country's male and female AI talent concentration and unemployment rate. One graph should showcase the relationship for each country.

Describe the data preparation steps undertaken, methods utilized, and outcome.

**Answer:**

# Submit this report on the following link.

: <https://wmich.co1.qualtrics.com/jfe/form/SV_2nvW4hfh4wDnNXw>