Subject	BUS5VA Visual Analytics, Semester 2 2024
Assessment 2	Data visualisation using Tableau
Due date	11:59 pm (AEST/AEDT), Sunday 29 September 2024 (Week 8)
Weighting	40%
SILOs	SILO 2: Describe the visualisation framework in a variety of business problems.
	SILO 3: Select appropriate visualisation techniques for diverse business problems and critically evaluate various visualisation choices throughout the entire solution process.
	SILO 4: Apply suitable tools to visualise the data and analytical findings based on specific user requirements.
GC	Inquiry and Analysis; Discipline Knowledge and Skills
Feedback	Feedback will be provided within three weeks after submission due date.

In this Assignment, you will create visualisations using Tableau to gain insights into two real-world case studies, Bank Marketing Campaign, and Sport Analytics.

Case Study 1 [20 Marks] - Bank Marketing Campaign for Intelligent Targeting

In this case study, envision yourself as a junior business analyst collaborating with the marketing team to analyse and determine the best campaign strategy for a bank aimed at attracting customers to open term deposits. Successful marketing campaigns are characterised by their focus on customer needs and overall satisfaction. However, several variables play a pivotal role in determining the success of a marketing campaign. We must carefully consider the following variables when crafting a marketing campaign:

- Customer Segmentation: Identify the target population segment and justify your choice. This aspect is very important as it suggests which segment of the population is most likely to respond to the marketing campaign's message.
- Distribution Channels: Devise the most effective strategy for reaching customers. It is important to define the target population segment to address and select appropriate communication channels, such as telephones, TV, and social media, for disseminating the campaign's message.
- Pricing Strategy: Determine the optimal pricing strategy for potential clients. Note that in the context of the bank's marketing campaign, pricing may not be the primary concern, as the bank's primary objective is to encourage clients to open deposit accounts to support its operational activities.
- Promotional Strategy: Outline the strategy's execution and how potential clients will be engaged. This step should follow an in-depth analysis of past campaigns (if available) to gain insights from past mistakes and enhance the overall effectiveness of the marketing campaign.

The dataset for this case study can be accessed on the Learning Management System (LMS), located in the Assessment 2 dataset folder. It contains a wide range of attributes related to bank clients and the last contact of the current campaign:

- Bank Client Data:
    - Age: Numeric
    - Job: Type of job
    - Marital: Marital status
    - Education: Education level
    - Default: Credit in default or not
    - Housing: Has housing loan?
    - Loan: Has personal loan?

- o Balance: Individual's balance
- Related to the Last Contact of the Current Campaign:
    - o Contact: Contact communication type
    - o Month: Last contact month of the year
    - o Day: Last contact day of the month
    - o Duration: Last contact duration in seconds
- Other Attributes:
    - o Campaign: Number of contacts performed during this campaign for this client
    - o Pdays: Number of days since the client was last contacted in a previous campaign (-1 indicates the client was not previously contacted)
    - o Previous: Number of contacts performed before this campaign for this client
    - o Poutcome: Outcome of the previous marketing campaign
- Output Variable:
    - o Deposit: Has the client subscribed to a term deposit?

Your task as a junior business analyst is to address the following questions from the marketing team by creating visualisations in Tableau:

Task 1.1 (5 Marks): Investigate whether there is a significant age distribution difference between clients who make a deposit and those who do not.

Task 1.2 (5 Marks): Analyse whether a client's job or career has an impact on their likelihood to make a deposit.

Task 1.3 (5 Marks): Explore how the duration of the last contact influences the campaign's success (i.e., the likelihood to make a deposit).

Task 1.4 (5 Marks): Identify at least four campaign strategies, such as who should be contacted, how to contact them, and when to contact them. Present your findings in the form of a dashboard in Tableau.

Case Study 2 [20 Marks] - Sports Analytics for Informed Decision Making

In this case study, you will take on the role of an analyst consultant working closely with the manager of a soccer team. Your objective is to explore the Soccer Match Dataset (available on LMS) and help the team manager to make informed decisions.

The Soccer Match Dataset is a comprehensive collection of spatio-temporal events that occur during an entire season of seven soccer competitions, including La Liga, Serie A, Bundesliga, Premier League, Ligue 1, FIFA World Cup 2018, and UEFA Euro Cup 2016. This dataset offers valuable insights into various aspects of soccer matches, such as passes, shots, fouls, and more, and contains information about position, time, outcome, player, and other characteristics.

The Soccer Match Dataset comprises two distinct datasets: the Player dataset (players.csv) and the Event dataset (events.csv), detailed as follows:

- Player Dataset:
    - o birthArea: Geographic information regarding the player's birthplace.
    - o birthDate: Player's date of birth, formatted as "YYYY-MM-DD."
    - o currentNationalTeamId: Identifier of the national team the player currently represents.
    - o currentTeamId: Identifier of the team for which the player currently plays; corresponds to the "wyId" field in a team document.
    - o firstName: Player's first name.
    - o lastName: Player's last name.

- foot: Preferred foot of the player.
- height: Player's height in centimeters.
- middleName: Player's middle name, if applicable.
- passportArea: Geographic area associated with the player's current passport.
- role: Player's main role, consisting of the role's name and two abbreviations.
- shortName2: Player's short name.
- weight: Player's weight in kilograms.
- wyId: Unique identifier assigned to the player by Wyscout.
- Event Dataset:
    - eventId: Identifier of the event type.
    - eventName: Name of the event type, including pass, foul, shot, duel, free kick, offside, and touch.
    - subEventId: Identifier of the subevent type.
    - subEventName: Name of the subevent type.
    - tags: A list of event tags providing additional event-specific information.
    - eventSec: Time of the event in seconds since the start of the current half of the match.
    - id: A unique identifier for the event.
    - matchId: Identifier of the match to which the event refers; corresponds to the "wyId" field in the match dataset.
    - matchPeriod: Period of the match, including "1H" (first half), "2H" (second half), "E1" (first extra time), "E2" (second extra time), or "P" (penalties).
    - playerId: Identifier of the player who generated the event; corresponds to the "wyId" field in the player dataset.
    - positions: Origin and destination positions associated with the event, represented as pairs of coordinates (x, y), indicating the event's location on the field.
    - teamId: Identifier of the player's team; corresponds to the "wyId" field in the team dataset.

Your task is to conduct descriptive analytics on this dataset and create interactive Tableau visualisations to empower the team manager with insights into the datasets, enabling informed decision-making.

Task 2.1 (5 Marks): The manager is searching for a skilled goalkeeper to join the team. Generate visualisations ranking goalkeepers based on the number of save attempts they made and highlight the top 5 goalkeepers with the most save attempts. Your visualisations should enable users to access player attributes, including weight, height, full name, and nationality, by hovering over the players of interest.

Task 2.2 (5 Marks): Lionel Messi (wyId: 3359) and Cristiano Ronaldo (wyId: 3322) are two of the greatest soccer players. Compare the game performance (e.g., the number of shots and number of passes) and physical characteristics (e.g., height, weight, and dominant foot) of Lionel Messi and Cristiano Ronaldo, to aid the manager in deciding between the two legendary players for potential recruitment.

Task 2.3 (5 Marks): The manager is interested in the potential impact of players' physical characteristics on their game performance. Create visualisations to investigate the correlations between players' physical characteristics (e.g., height, weight, and dominant foot) and their game performance (e.g., the number of passes, number of shots, and number of free kick).

Task 2.4 (5 Marks): Develop a Tableau dashboard to be used by the manager for future reference. Your dashboard should enable the manager to (1) rank players based on a selected event type (focusing on Pass, Shot, Free Kick, Foul, Offside) and (2) compare game statistics between the first half (1H) and second half (2H) of matches, based on a selected event type (Pass, Shot, Free Kick, Foul, Offside).

Submission Instructions

To ensure a smooth submission process for your assignment, please adhere to the following guidelines:

- File Formats: You are required to submit your Tableau workbooks as twbx files. Ensure that all twbx files are self-contained and can be opened in Tableau without encountering any errors. Note that data files are not required for opening the twbx files. Additionally, you are required to provide Word files that contain descriptions and explanations for your visualisations.

- Word File Descriptions: In your Word documents, you are required to thoroughly describe and explain the visualisations you created using Tableau to address each task for the case studies. For each visualisation, you are expected to address "what" you are trying to convey and "how" you have chosen to present it. You can reference relevant visual variables employed (e.g., colour, size, shape) and visualisation techniques (e.g., informative titles, highlighting, annotating, faceting, etc.). An example of the description would be *"This visualisation displays the change in unemployment rates over time, utilizing a line chart to illustrate the trend. Distinct colours have been applied to differentiate between different cities, with the city of New York highlighted through increased line thickness."*

- Number of Files: For this assignment, you must submit two twbx files, each corresponding to one case study. Simultaneously, submit two Word files, each containing visualisations and explanations for the tasks within their respective case studies.

- Submission site: Use the provided submission link on LMS to upload your files.

Important Information

- Standard plagiarism and collusion policy, and extension and special consideration policy of this university apply to this assignment.

- A cover sheet is NOT required. By submitting your work online, the declaration on the university's assignment cover sheet is implied and agreed to by you.

Marking Rubric

CRITERIA	A: Excellent (> 80 %)	B: Very good (70 − 79%)	C: Good (60 − 69%)	D: Acceptable (50 − 59%)	N: Unacceptable (<50%)
Technical Proficiency in Tableau and Data Accuracy (40%)	All visualisations and interactivity are flawlessly created in Tableau, with meticulous attention to detail. The correct data is consistently and accurately selected for each visualisation, resulting in a seamless and error-free presentation of the data.	Most visualisations and interactivity are created skillfully in Tableau, with very few minor errors, if any. The correct data is predominantly chosen for visualisations, ensuring a high level of accuracy and effectiveness in conveying the data.	Visualisations and interactivity are generally created competently in Tableau, with some minor errors that do not significantly impact the overall quality. The selection of correct data is mostly accurate, contributing to a reasonable level of effectiveness in data presentation.	Visualisations and interactivity are created acceptably in Tableau, although some noticeable errors may be present. The selection of correct data is somewhat accurate but may contain notable inconsistencies or inaccuracies, which moderately affect the quality of data representation.	Visualisations and interactivity exhibit significant errors and issues when created in Tableau. The selection of correct data is inadequate, resulting in a multitude of errors and inaccuracies that severely hinder the quality and effectiveness of data visualisation.
Clarity and Completeness of Visualisation Descriptions and Justifications (40%)	All visualisations are described and justified with exceptional clarity and conciseness. Descriptions are comprehensive, providing detailed information about all relevant visual elements, enhancing the understanding of each visualisation.	Most visualisations are described and justified with a high degree of clarity and conciseness. Descriptions include information about the majority of relevant visual elements, contributing significantly to the understanding of each visualisation.	Visualisations are described and justified reasonably well, with generally clear and concise explanations. Descriptions cover most of the relevant visual elements, aiding in the understanding of each visualisation to a satisfactory extent.	Descriptions and justifications of visualisations are acceptable but may lack some clarity and conciseness. They include information about a subset of relevant visual elements, contributing adequately to the understanding of each visualisation.	Descriptions and justifications of visualisations are unclear, verbose, or incomplete, making it challenging to comprehend the visual elements. They lack information about essential visual elements, significantly hindering the understanding of each visualisation.
Effective Application of Visualisation Theory and Message Conveyance (20%)	Visualisation theory is applied flawlessly to charts, resulting in exceptionally informative, efficient, and aesthetically pleasing visualisations. Each visualisation vividly and clearly conveys the intended message, showcasing a mastery of both theory and practical execution.	Visualisation theory is applied effectively to charts, with a high level of informativeness, efficiency, and aesthetic appeal in the visualisations. Most visualisations successfully and clearly convey the intended message, demonstrating a strong grasp of theory and execution.	Visualisation theory is generally applied well to charts, resulting in visualisations that are informative, efficient, and reasonably visually appealing. Some visualisations effectively convey the intended message, indicating a solid understanding of theory and execution.	Visualisation theory is applied acceptably to charts, with some room for improvement in informativeness, efficiency, and aesthetic quality. Visualisations convey the intended message to an extent, reflecting a basic understanding of theory and execution.	Visualisation theory is inadequately applied to charts, leading to visualisations that lack informativeness, efficiency, and aesthetic appeal. Visualisations struggle to convey the intended message, indicating a deficient understanding of theory and execution.