Unit 3 Data Analytics 2025

Outcome 1 Data analytics – Template for developing an assessment task – Blank

Outcome 1

On completion of this unit the student should be able to interpret teacher-provided solution requirements and designs, extract data from large repositories, manipulate and cleanse data, conduct statistical analysis and develop data visualisations to present findings.

Key knowledge	Key skills
• emerging trends in data analytics using artificial intelligence, including: – integration of artificial intelligence features into software tools – generating data visualisations through the writing and refinement of prompts – machine learning and statistical modelling for making predictions, decisions and recommendations • characteristics of functional and non-functional requirements, constraints and scope • design tools for representing databases and spreadsheets, including: – data dictionaries – query designs – layout diagrams – input-process-output (IPO) charts • design tools for representing data visualisations, including: – mock-ups – storyboards	• interpret solution requirements and designs
• characteristics of data types, including: – text (character, string) – numeric (integer, floating point, date/time) – Boolean • techniques for identifying, selecting, extracting and validating authentic data stored in large repositories, including: – downloading datasets in a range of formats – the use of SQL functions to retrieve, filter, sort and link dataset values (SELECT, FROM, WHERE, ORDER BY, INNER JOIN) – the use of Boolean operators (AND, NOT, OR) for WHERE statements – existence checking, type checking and range checking • structural characteristics of relational database management systems (RDBMS), including: – data types and field sizes	• identify, select, extract and validate relevant data from large repositories using database software

Assessment task development

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– data in tables – relationships using primary and foreign key fields – use of SQL to generate queries		
• methods for referencing data sources using the American Psychological Association (APA) referencing system	• use the APA referencing system to acknowledge intellectual property	
• techniques for effectively and efficiently manipulating and cleansing data, including: – formulas and functions to perform calculations – sorting, filtering and reformatting – identifying and fixing errors	• manipulate and cleanse data using spreadsheet software	
• techniques to statistically analyse data to identify trends, relationships and patterns, including: – descriptive statistics (average, median, minimum, maximum, range, standard deviation, count/frequency, sum) – Pearson's correlation co-efficient (r) – the shape and skew of data	• conduct statistical analysis to identify trends, relationships and patterns	
• purposes of data visualisations, including: – exploratory data analysis – presentation of information – providing interactive experiences for users to explore data • types of data visualisations, including: – infographics (series or long-form, static) – dashboards (interactive, static or live data) – dynamic data visualisations (interactive, live data) • formats and conventions applied to data visualisations to improve their effectiveness for intended users, including: – use of colours, fonts, images and icons – visual hierarchy and clarity of message	• select, justify and apply functions, formats and conventions to create effective data visualisations	
• techniques for testing databases and spreadsheets, including: – testing formula and query results – testing validation – test cases comparing expected and actual results in testing tables • techniques for testing data visualisations, including: – visual inspection of the appearance of the data visualisation – confirming that charts and graphs are representative of the data being visualised	• develop and apply suitable testing techniques to software tools used	