

VCE Data Analytics 2024

Unit 3 School-based Assessment

Video 3

Planning the

Unit 3 Outcome 1 SAC



VICTORIAN CURRICULUM
AND ASSESSMENT AUTHORITY



Acknowledgement of Country

The VCAA respectfully acknowledges the Traditional Owners of Country throughout Victoria and pays respect to the ongoing living cultures of First Peoples.



VCE Data Analytics 2024

Unit 3 School-based Assessment

Video 3

Planning the Unit 3 Outcome 1 SAC

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Purpose of this session

- to build the capacity of teachers to develop compliant, rigorous and engaging VCE assessment tasks in line with the VCE assessment principles
- provide an overview of how to plan for the Unit 3 Outcome 1 School-assessed Coursework (SAC) task.

Unit 3 Outcome 1

Unit 3 Outcome 1 – The outcome

On completion of this unit the student should be able to respond to teacher-provided solution requirements and designs to extract data from large repositories, manipulate and cleanse data and apply a range of functions to develop software solutions to present findings.

Key knowledge

Data and information

- techniques for efficient and effective data collection, including methods to collect census, Geographic Information System (GIS) data, sensor, social media and weather
- factors influencing the integrity of data, including accuracy, authenticity, correctness, reasonableness, relevance and timeliness
- sources of, and methods and techniques for, acquiring authentic data stored in large repositories
- methods for referencing primary and secondary sources, including American Psychological Association (APA) referencing system
- characteristics of data types

Approaches to problem solving

- methods for documenting a problem, need or opportunity
- methods for determining solution requirements, constraints and scope
- naming conventions to support efficient use of databases, spreadsheets and data visualisations

- a methodology for creating a database structure: identifying entities, defining tables and fields to represent entities; defining relationships by identifying primary key fields and foreign key fields; defining data types and field sizes, normalisation to third normal form
- design tools for representing databases, spreadsheets and data visualisations, including data dictionaries, tables, charts, input forms, queries and reports
- design principles that influence the functionality and appearance of databases, spreadsheets and data visualisations
- functions and techniques to retrieve required information through querying data sets, including searching, sorting and filtering to identify relationships and patterns
- software functions, techniques and procedures to efficiently and effectively validate, manipulate and cleanse data including files, and applying formats and conventions
- types and purposes of data visualisations
- formats and conventions applied to data visualisations to improve their effectiveness for intended users, including clarity of message
- methods and techniques for testing databases, spreadsheets and data visualisations

Interactions and impact

- reasons why organisations acquire data.

Key skills

- interpret solution requirements and designs to develop data visualisations
- identify, select and extract relevant data from large repositories
- use a standard referencing system to acknowledge intellectual property
- organise, manipulate and cleanse data using database and spreadsheet software
- select, justify and apply functions, formats and conventions to create effective data visualisations
- develop and apply suitable validation and testing techniques to software tools used.

Unit 3 Outcome 1 – The assessment task

Contribution to final assessment

School-assessed Coursework for Unit 3 will contribute 10 per cent to the study score.

| Outcomes | Marks allocated | Assessment tasks |
|---|-----------------|---|
| Unit 3 Outcome 1 Respond to teacher-provided solution requirements and designs to extract data from large repositories, manipulate and cleanse data and apply a range of functions to develop software solutions to present findings. | 100 | In response to teacher-provided solution requirements and designs, create software solutions. |
| Total marks | 100 | |

Planning the Unit 3 Outcome 1 SAC task using VCAA resources

Unit 3 Outcome 1 Resources

Accreditation Period
2020–2024

ADVICE FOR TEACHERS - APPLIED COMPUTING

Victorian Certificate of Education

APPLIED COMPUTING

STUDY DESIGN

Applied Computing

Introduction

Unit 1

Unit 2

Unit 3: Data analytics

Unit 4: Data analytics

Unit 3 and 4: Data Analytics - School-assessed Task

Unit 3: Software development

Unit 3: Data analytics

Sample approaches to developing an assessment task

Area of Study 1

On completion of this unit the student should be able to respond to teacher-provided solution requirements and designs to extract data from large repositories, manipulate and cleanse data and apply a range of functions to develop software solutions to present findings.



VCE Applied Computing: Performance Descriptors

DATA ANALYTICS UNIT 3 OUTCOME 1 SCHOOL-ASSESSED COURSEWORK

Performance Descriptors

| | DESCRIPTOR: typical performance in each range | | | | |
|--|---|---|--|--|--|
| | Very low | Low | Medium | High | Very high |
| <p>Unit 3 Outcome 1</p> <p>Respond to teacher-provided solution requirements and designs to extract data from large repositories, manipulate and cleanse data and apply a range of functions to develop software solutions to present findings</p> | <p>Limited integration of solution requirements and designs to develop the database spreadsheet and data visualisation solutions.</p> <p>Limited data is identified and selected from data repositories.</p> <p>Limited features of the database software tool have been used to store and manipulate data.</p> | <p>Some relevant data is identified, selected and extracted from data repositories with some referencing to administrative intellectual property.</p> <p>A range of features of the database software tool have been used to store and manipulate data.</p> | <p>Sound integration of solution requirements and designs to develop the database spreadsheet and data visualisation solutions.</p> <p>A range of relevant data is identified, selected and extracted from aggregate data repositories to acknowledge intellectual property.</p> | <p>Most solution requirements and designs are integrated accurately in developing the database spreadsheet and data visualisation solutions.</p> <p>Most relevant data is identified, selected and extracted from aggregate data repositories and referenced to administrative intellectual property.</p> <p>Most features of the database software tool have been used to store, manipulate and visualise data.</p> | <p>All solution requirements and designs are integrated accurately in developing the database spreadsheet and data visualisation solutions.</p> <p>All relevant data is identified, selected and extracted from aggregate data repositories and referenced to administrative intellectual property.</p> <p>Comprehensive use of features of the database software tool used to store, manipulate and visualise data.</p> |

Unit 3 Data Analytics

Unit 3 Outcome 1 – SAC task template

Instructions

The purpose of this template is to assist teachers with the development of the Unit 3 Outcome 1 School-assessed Coursework task and in the meeting of requirements by following the VCE assessment process. Teachers can use this template to insert the necessary content for the School-assessed Coursework task.

The following content is included in this template:

- Relevant VCAA measures for the development of the Unit 3 Outcome 1 SAC task.

Key knowledge

- The Unit 3 Outcome 1 statement.
- The Unit 3 Outcome 1 key knowledge.
- The Unit 3 Outcome 1 key skills.
- Details related to task development including:
 - conditions
 - assessable
 - solution requirements
 - solution design
 - assessment (creating activities)
- Details related to developing the final marking scheme for the task and determining the score out of 100 marks.

Use of commercial tasks

When referring to or using a commercially produced task teachers need to ensure that the tasks they develop are to be sufficiently modified from the original commercial task. All commercially produced tasks must be cross-checked against the:

- software copyright
- key words

Also, for subscription measures, the content (the background to the case study or scenario) and the content (solution requirements and design) of the task must be significantly changed from the original publication. Each year. This involves the latest year's commercial task as well as previous years and any any previous year's school-developed assessment tasks.

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| Unit 3 Data Analytics – SAC Task | | Assessment task development – Task |
|--|--|---|
| Outcome 1 | Key knowledge | Assessment task development |
| <p>Outcome 1</p> <p>On completion of this unit the student should be able to respond to teacher-provided solution requirements and designs to extract data from large repositories, manipulate and cleanse data and apply a range of functions to develop software solutions to present findings</p> | <p>Key skills</p> <ul style="list-style-type: none"> analyse multiple requirements and designs to develop data visualisation analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository | <p>VCAA Performance Descriptors (Key Skills)</p> <ul style="list-style-type: none"> analyse multiple requirements and designs to develop data visualisation analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository |
| <p>Outcome 1</p> <p>On completion of this unit the student should be able to respond to teacher-provided solution requirements and designs to extract data from large repositories, manipulate and cleanse data and apply a range of functions to develop software solutions to present findings</p> | <p>Key knowledge</p> <ul style="list-style-type: none"> analyse multiple requirements and designs to develop data visualisation analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository | <p>VCAA Performance Descriptors (Key Knowledge)</p> <ul style="list-style-type: none"> analyse multiple requirements and designs to develop data visualisation analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository |
| <p>Outcome 1</p> <p>On completion of this unit the student should be able to respond to teacher-provided solution requirements and designs to extract data from large repositories, manipulate and cleanse data and apply a range of functions to develop software solutions to present findings</p> | <p>Key skills</p> <ul style="list-style-type: none"> analyse multiple requirements and designs to develop data visualisation analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository | <p>VCAA Performance Descriptors (Key Skills)</p> <ul style="list-style-type: none"> analyse multiple requirements and designs to develop data visualisation analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository |
| <p>Outcome 1</p> <p>On completion of this unit the student should be able to respond to teacher-provided solution requirements and designs to extract data from large repositories, manipulate and cleanse data and apply a range of functions to develop software solutions to present findings</p> | <p>Key knowledge</p> <ul style="list-style-type: none"> analyse multiple requirements and designs to develop data visualisation analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository | <p>VCAA Performance Descriptors (Key Knowledge)</p> <ul style="list-style-type: none"> analyse multiple requirements and designs to develop data visualisation analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository analyse and extract relevant data from large repositories store, manipulate and cleanse data using spreadsheet software use a database querying system to extract information from a large repository |

Task development template – Blank

| Unit 3 Data Analytics – 2024 | | |
|--|--|--|
| Outcome 1 Data analytics – Template for developing an assessment task – Blank | | |
| <p>Outcome 1 On completion of this unit the student should be able to respond to teacher-provided solution requirements and designs to extract data from large repositories, manipulate and cleanse data and apply a range of functions to develop software solutions to present findings.</p> | | Assessment task development |
| Key knowledge | Key skills | VCAA Performance descriptors (Very high) |
| <ul style="list-style-type: none"> • methods for documenting a problem, need or opportunity • methods for determining solution requirements, constraints and scope • design tools for representing databases, spreadsheets and data visualisations, including data dictionaries, tables, charts, input forms, queries and reports • design principles that influence the functionality and appearance of databases, spreadsheets and data visualisations | <ul style="list-style-type: none"> • interpret solution requirements and designs to develop data visualisations | <ul style="list-style-type: none"> • All solution requirements and designs are interpreted accurately in developing the database, spreadsheet and data visualisation solutions. |
| <ul style="list-style-type: none"> • reasons why organisations acquire data • techniques for efficient and effective data collection, including methods to collect census, Geographic Information System (GIS) data, sensor, social media and weather • factors influencing the integrity of data, including accuracy, authenticity, correctness, reasonableness, relevance and timeliness • sources of, and methods and techniques for, acquiring authentic data stored in large repositories | <ul style="list-style-type: none"> • identify, select and extract relevant data from large repositories | <ul style="list-style-type: none"> • All relevant data is identified, selected and extracted from appropriate data repositories and referenced to acknowledge intellectual property. |
| <ul style="list-style-type: none"> • methods for referencing primary and secondary sources, including American Psychological Association (APA) referencing system | <ul style="list-style-type: none"> • use a standard referencing system to acknowledge intellectual property | |
| <ul style="list-style-type: none"> • characteristics of data types • naming conventions to support efficient use of databases, spreadsheets and data visualisations • a methodology for creating a database structure: identifying entities, defining tables and fields to represent entities; defining relationships by identifying primary key fields and foreign key fields; defining data types and field sizes; normalisation to bind normal form • functions and techniques to retrieve required information through querying data sets, including searching, sorting and filtering to identify relationships and patterns • software functions, techniques and procedures to efficiently and effectively validate, manipulate and cleanse data including files, and applying formats and conventions | <ul style="list-style-type: none"> • organise, manipulate and cleanse data using database and spreadsheet software | <ul style="list-style-type: none"> • Comprehensive use of features of the database software tool used to store, manipulate and validate data. • Comprehensive use of features of the spreadsheet software tool have been used to manipulate and validate data. |
| <ul style="list-style-type: none"> • types and purposes of data visualisations • formats and conventions applied to data visualisations to improve their effectiveness for intended users, including clarity of message | <ul style="list-style-type: none"> • select, justify and apply functions, formats and conventions to create effective data visualisations | <ul style="list-style-type: none"> • Comprehensive use of functions, formats and conventions to create effective data visualisations. • Comprehensive justification and explanation of how the selected functions, formats and conventions are used to create effective data visualisations. |
| <ul style="list-style-type: none"> • methods and techniques for testing databases, spreadsheets and data visualisations | <ul style="list-style-type: none"> • develop and apply suitable validation and testing techniques to software tools used | <ul style="list-style-type: none"> • Comprehensive range of test data is expressed in testing tables, with both expected and actual output stated. |

Task development template – Plan

| Unit 3 Data Analytics – 2024 | | | |
|--|--|---|---|
| Outcome 1 Data analytics – Template for developing an assessment task – Plan | | | |
| <p>Outcome 1 On completion of this unit the student should be able to respond to teacher-provided solution requirements and designs to extract data from large repositories, manipulate and cleanse data and apply a range of functions to develop software solutions to present findings.</p> | <p>Assessment task development – Planning for the case study Create a scenario that is a real-world example that provides students with solution requirements and designs that will enable them to extract authentic data from large repositories, manipulate and cleanse the data and develop software solutions using spreadsheet, database and data visualisation software tools to present findings. The outcome may be completed as four tasks: data collection, spreadsheet solution, database solution and data visualisation solution. Key content within the tasks should be based on the targeted key knowledge and key skills. The total number of the marks for the outcome should be out of 100.</p> | | |
| <p>Key knowledge</p> <ul style="list-style-type: none"> • methods for documenting a problem, need or opportunity • methods for determining solution requirements, constraints and scope • design tools for representing databases, spreadsheets and data visualisations, including data dictionaries, tables, charts, input forms, queries and reports • design principles that influence the functionality and appearance of databases, spreadsheets and data visualisations • reasons why organisations acquire data • techniques for efficient and effective data collection, including methods to collect census, Geographic Information System (GIS) data, sensor, social media and weather • factors influencing the integrity of data, including accuracy, authenticity, correctness, reasonableness, relevance and timeliness • sources of, and methods and techniques for, acquiring authentic data stored in large repositories • methods for referencing primary and secondary sources, including American Psychological Association (APA) referencing system • characteristics of data types • naming conventions to support efficient use of databases, spreadsheets and data visualisations • a methodology for creating a database structure: identifying entities, defining tables and fields to represent entities, defining relationships by identifying primary key fields and foreign key fields; defining data types and field sizes, normalisation to third normal form • functions and techniques to retrieve required information through querying data sets, including searching, sorting and filtering to identify relationships and patterns • software functions, techniques and procedures to efficiently and effectively validate, manipulate and cleanse data including files, and applying formats and conventions • types and purposes of data visualisations • formats and conventions applied to data visualisations to improve their effectiveness for intended users, including clarity of message • methods and techniques for testing databases, spreadsheets and data visualisations | <p>Key skills</p> <ul style="list-style-type: none"> • interpret solution requirements and designs to develop data visualisations • identify, select and extract relevant data from large repositories • use a standard referencing system to acknowledge intellectual property • organise, manipulate and cleanse data using database and spreadsheet software • select, justify and apply functions, formats and conventions to create effective data visualisations • develop and apply suitable validation and testing techniques to software tools used | <p>VCAA Performance descriptors (Very high)</p> <ul style="list-style-type: none"> • All solution requirements and designs are interpreted accurately in developing the database, spreadsheet and data visualisation solutions. • All relevant data is identified, selected and extracted from appropriate data repositories and referenced to acknowledge intellectual property. • Comprehensive use of features of the database software tool used to store, manipulate and validate data. • Comprehensive use of features of the spreadsheet software tool have been used to manipulate and validate data. • Comprehensive use of functions, formats and conventions to create effective data visualisations. • Comprehensive justification and explanation of how the selected functions, formats and conventions are used to create effective data visualisations. • Comprehensive range of test data is expressed in testing tables, with both expected and actual output stated. | <p>Content to be included in the assessment task should introduce students to a scenario. The scenario should indicate the data repositories that students are to use. The scenario should clearly state the solution requirements and designs for the spreadsheet, database and data visualisation solutions and provide students with sufficient opportunities to demonstrate their knowledge and to meet the requirements of the outcome. A range of appropriate design tools should be used. Students are not to complete designs themselves. Design tools should be appropriate for the software tool used.</p> <p>Students are to identify, select and extract the relevant data from the repositories listed in the scenario and use the APA referencing system to acknowledge the intellectual property used within the data visualisations.</p> <p>The scenario with the solution requirements and designs should enable students to determine the appropriate selection and use of features for the database software tool and the spreadsheet software tool to enable them to organise, manipulate and cleanse data. (Refer to the Software tools and functions document on the study page). Students are to use a database software tool and a spreadsheet software tool. Relevant data validation techniques are to be used within the spreadsheet software tool and the database software tool.</p> <p>The scenario with the solution requirements and designs should enable students to determine the appropriate use of functions, formats and conventions for the data visualisation tool to enable them to create their data visualisations (Refer to the Software tools and functions document on the study page). Students are to use a data visualisation tool. They are to justify and explain their selection of functions, formats and conventions used to develop their data visualisations. This written justification and explanation could be included as a separate written report.</p> <p>A testing table is to be developed that involves the testing of all validation and processing such as calculations, etc. The testing table should include columns for expected and actual output and show evidence of tests that work and don't work.</p> |



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