

VCE Data Analytics 2024

Unit 3 School-based Assessment

Video 2

Background to the Unit 3 Outcome 1 SAC



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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 2

Background to the Unit 3 Outcome 1 SAC

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Purpose of this presentation

- 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 the Unit 3 Outcome 1 School-assessed Coursework (SAC) task.

Unit 3 Outcome 1

School-assessed Coursework (SAC)

**Developing a compliant, engaging
and rigorous assessment task**

Planning

When you are ready to write the assessment task have the following documents in front of you (These are all on the Data Analytics study page):

- Applied Computing Study Design – U3 O1 Data Analytics – pages 25–29
 - Area of Study statement, Outcome statement, Key knowledge and Key skills
- Software tools and functions document
- Advice for teachers
 - Data Analytics: Unit 3 Area of Study 1 – Sample approaches to developing an assessment task
 - Data Analytics: Unit 3 Outcome 1 – Performance descriptors
- School-based Assessment Audit report (2020)
- Resources:
 - 2024 Data Analytics U3O1 Assessment task development template – Blank
 - 2024 Data Analytics U3O1 Assessment task development template – Plan
 - 2024 Data Analytics U3O1 Developing a marking scheme – Sample
 - 2024 Data Analytics U3O1 SAC Task template

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.

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	

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.

Teaching towards the assessment task

Learning activities have been developed to meet the Unit 3 Outcome 1 Key knowledge bullet points.

These learning activities can be found in the *Advice for teachers*.

Examples of learning activities

- Investigate the techniques used by the Australian Bureau of Statistics to collect census data in 2016. In that year, there was a change of collection method from paper-based to online. Compare and contrast the techniques used.
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- Provide students with a range of data sets. Include data that is missing one characteristic of integrity: timeliness, authenticity, relevance, accuracy, reasonableness or correctness. For each example, discuss criteria that could be used to identify data that breaches these characteristics and methods that could be put in place to ensure the integrity of 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.

VCAA 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
Unit 3 Outcome 1 <i>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.</i>	Limited interpretation of solution requirements and designs to develop the database, spreadsheet and data visualisation solutions.	Some interpretation of solution requirements and designs to develop the database, spreadsheet and data visualisation solutions.	Sound interpretation of solution requirements and designs to develop the database, spreadsheet and data visualisation solutions.	Most solution requirements and designs are interpreted accurately in developing the database, spreadsheet and data visualisation solutions.	All solution requirements and designs are interpreted accurately in developing the database, spreadsheet and data visualisation solutions.
	Limited data is identified and selected from data repositories.	Some relevant data is identified, selected and extracted from data repositories with some referencing to acknowledge intellectual property.	A range of relevant data is identified, selected and extracted from appropriate data repositories and referenced to acknowledge intellectual property.	Most relevant data is identified, selected and extracted from appropriate data repositories and referenced to acknowledge intellectual property.	All relevant data is identified, selected and extracted from appropriate data repositories and referenced to acknowledge intellectual property.
	Limited features of the database software tool have been used to store and manipulate data.	Some features of the database software tool have been used to store and manipulate data.	A range of features of the database software tool have been used to store and manipulate data. There has been some validation of data.	Most features of the database software tool have been used to store, manipulate and validate data.	Comprehensive use of features of the database software tool used to store, manipulate and validate data.
	Limited features of the spreadsheet software tool have been used to manipulate data.	Some features of the spreadsheet software tool have been used to manipulate data.	A range of features of the spreadsheet software tool have been used to manipulate data. There has been some validation of data.	Most features of the spreadsheet software tool have been used to manipulate and validate data.	Comprehensive use of features of the spreadsheet software tool have been used to manipulate and validate data.
	Limited functions, formats and conventions have been used to create data visualisations.	Some functions, formats and conventions have been used to create data visualisations.	A range of functions, formats and conventions have been used to create data visualisations.	Most functions, formats and conventions have been used to create effective data visualisations.	Comprehensive use of functions, formats and conventions to create effective data visualisations.
	Limited justification and explanation of how the selected functions, formats and conventions are used to create data visualisations.	Some justification and explanation of how the selected functions, formats and conventions are used to create data visualisations.	Sound justification and explanation of how the selected functions, formats and conventions are used to create effective data visualisations.	Detailed justification and explanation of how the selected functions, formats and conventions are used to create effective data visualisations.	Comprehensive justification and explanation of how the selected functions, formats and conventions are used to create effective data visualisations.
	Limited range of test data is expressed in a testing table, with incomplete or missing results.	Some test data is expressed in a testing table with actual output stated.	A range of test data is expressed in testing tables, with both expected and actual output stated.	Detailed range of test data is expressed in testing tables, with both expected and actual output stated.	Comprehensive range of test data is expressed in testing tables, with both expected and actual output stated.

Software tools and functions document

VCE Applied Computing: Data Analytics: Software tools and functions

The VCE Applied Computing Study Design (2020–2024) mandates software tools and functions that students are to use when developing software solutions. For 2024, schools must use these software tools and functions as the basis for choosing appropriate database, spreadsheet and data visualisation software for study.

Students use other software tools for documenting project plans and capturing data, but there is not a mandated list of functions for these.

In Unit 3 Area of Study 1, students study and use:

- database software
- spreadsheet software
- data visualisation software.

In Unit 4 Area of Study 1, students study and use:

- database software and/or spreadsheet software
- data visualisation software.

Software functions

The following is a list of software functions for each of the software tools that are studied and used, and that students are expected to be able to apply. Note that this list is not exhaustive; learning does not have to be confined to the functions listed.

For School-based Assessment, tasks set by teachers should be realistic and allow discrimination between student performances. When designing assessment tasks for those outcomes that require the use of software tools, not all of the listed functions need to be demonstrated when solving problems.

For assessment purposes, students must be familiar with all of the listed functions for the mandated software tools.

Unit 3 and Unit 4: Database software

Students are expected to apply functions that provide the ability to:

- create tables
- create relationships between tables (for RDBMS)
- use a range of data types
- validate data
- create, edit and use queries
- search and filter records
- perform calculations
- create and edit formatted reports

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Unit 3 and Unit 4: Spreadsheet software

Students are expected to apply functions that provide the ability to:

- sort records or index on different fields
- import and export data
- secure data.

Unit 3 and Unit 4: Spreadsheet software

Students are expected to apply functions that provide the ability to:

- create worksheets
- create links between worksheets
- use a range of data types
- validate data
- create, edit and use charts
- perform calculations using a range of functions (SUM, COUNT, MAX, MIN, AVERAGE, SUMIF, COUNTIF)
- use LOOKUP functions
- conditional formatting
- sort and filter data
- import and export data
- secure data.

Unit 3 and Unit 4: Data visualisation software

Students are expected to apply functions that provide the ability to:

- create/select a range of shapes
- create/select a range of chart types
- use symbols/tags/charts
- show relationships and patterns
- enter, edit and format text and other content
- use colour/shading
- use of animation in charts (showing movement or changes in response to user input)

In the development of dynamic data visualisations, the chosen data visualisation software tool should provide users with the ability to interact with the data visualisation in order to identify meaning.

Teachers of VCE Data Analytics should note that the Software tools and functions may be revised for 2025 and notification will be published in the [VCAA Bulletin](#).

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This document is available on the Data Analytics study page.

It gives guidance to the software tools and functions to be used by students for the Unit 3 Outcome 1 SAC task and the Unit 3 Outcome 2 and Unit 4 Outcome 1 SAT.

Designing the assessment task

To assist with the development of the Unit 3 Outcome 1 assessment tasks we have developed a SAC Task template for teachers to follow and use.

The purpose of the template is to assist teachers in developing an assessment task that meets requirements.

Unit 3 Data Analytics

Unit 3 Outcome 1 – Assessment task

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 principles. 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 resources for the development of the Unit 3 Outcome 1 SAC task.
- 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
 - scenario
 - solution requirements
 - solution designs
 - assessment (marking scheme)
- 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:

- outcome statement
- key knowledge
- key skills.

Also, for authentication reasons, the context (the background to the case study or scenario) and the content (solution requirements and designs) of the task must be significantly changed from the original publication each year. This involves the current year's commercial task as well as previous years and also any previous year's school-developed assessment tasks.

Designing the assessment task

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.

Developing the assessment task

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>



Developing the marking scheme

Unit 3 Data Analytics – 2024		
Outcome 1 Data analytics – Developing a marking scheme – Sample		
<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>Developing a marking scheme – Marks allocated – 100 Refer to the key skills on the VCAA performance descriptors when developing a marking scheme for the assessment task. Determine the weighting of the marks out of 100 for each key skill or performance descriptor. When determining weightings consider the time that students will take to complete each task as well as the level of difficulty of each task. Marks should be allocated to ensure students can demonstrate a range of levels of performance in the task.</p>	
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 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 	<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.

Using commercial tasks (SAC)

Recommendations – In order to meet VCE Assessment principles

- If you decide to start off using a commercial task for ideas then you need to check it and modify it.
- Check the commercial task against the current study design. This includes the outcome statement, key knowledge and key skills. Be very watchful that the tasks address the current study design.
- Significantly alter the commercially-produced tasks each year in terms of context and content (even for this current year).
- Check the marking scheme/assessment rubric and ensure it meets the key skills and performance descriptors.
- Do the task yourself to ensure you are satisfied that it meets requirements and is suitable to your cohort.

VASS SAC dates for 2024

- **Unit 3 School-based Assessment – September**
 - Data Analytics: Unit 3 Outcome 1

Teachers should be aware of the dates for submission of scores into VASS in September and November. These dates are published in the 2024 Important Administrative Dates and Assessment Schedule, published annually on the VCAA website. vcaa.vic.edu.au/pages/schooladmin/admindates/index.aspx.

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