

Sample assessment task

Unit 2, Outcome 2

Data analysis and visualisation

Outcome

On completion of this unit the student should be able to apply the problem-solving methodology and use appropriate software tools to extract relevant data and create a data visualisation that meets a specified user's needs.

Task

For Unit 2, Outcome 2 students are required to complete a two-step process. The first step involves acquiring and interpreting data. The second step involves manipulating data into a visual format.

Teachers are expected to provide students with a design brief for the task.

Data sources

Sources of data can include:

- Australian Bureau of Statistics
- Data.gov.au
- Victorian Government data directory
- Bureau of Meteorology
- World Bank collection of development indicators
- United Nations.

Software tools

Students are expected to use a software tool to extract data from a data source; use software tools to manipulate the data to identify patterns, connections or relationships within the data set; and use software tools to create visualisations.

Examples of software tools that may be used include:

- programming language
- database software
- spreadsheet software
- data visualisation software.

Visualisations

The type of visualisations that can be used to represent the data include:

- graphs
- charts
- spatial relationships
- maps
- histograms
- network diagrams.

Design brief: Sienna's digital divide

Sienna is in Year 9 and has recently become aware that there are many pressing issues in the world that affect her and others. One issue that she has discovered is that not everybody has equal access to the internet. She always thought that, because the internet is global, all people around the world have access to it.

Sienna wants to find out what percentage of the population in a range of countries has access to the internet. She believes this will be directly related to the wealth of each country that can be measured using the Gross Domestic Product (GDP) of a country.

She also wants to find out which countries have had the largest increase, in terms of the percentage of population, in internet access over the last 10 years, as she believes that this increase would occur in countries that have become wealthier in this time period.

Finally, Sienna believes that issue of the digital divide affects countries all around the world, and is not restricted to any particular areas or continents, and she wants to identify if this is true or not.

Requirements

1	Identify the needs that Sienna requires.	3 marks
2	List the sources that can be used to acquire the data.	2 marks
3	Acquire the data from the sources listed above. Submit the data files as evidence.	3 marks
4	Explain how the data collected can be checked for both accuracy and relevance.	2 marks
5	Prepare the data so that it is in an appropriate format to be used with the software tool selected that will be used to manipulate the data. Submit the file containing the formatted data as evidence.	3 marks
6	Discuss two techniques used to prepare the data so it was in an appropriate format to be used by the software tool for manipulation.	2 marks
7	Manipulate the data to identify patterns and relationships within the data. Submit the data files as evidence.	3 marks
8	Discuss two functions of the software used to help identify patterns and relationships within the data.	2 marks
9	Using an appropriate design tool create a design showing how each of the intended visualisations will appear.	3 marks
10	Create a design, using an appropriate design tool, showing the functionality of the data visualisation.	3 marks
11	Using appropriate software tools create the visualisations that represent the data collected.	6 marks
12	Create three criteria that can be used to evaluate if the needs that Sienna required have been met by the visualisations.	3 marks
13	Outline strategies that can be used to evaluate if each of the evaluation criteria has been achieved.	3 marks
14	Complete an evaluation report to identify if each of the criteria were achieved in the data visualisation using the strategies outlined.	2 marks
Total		40 marks

Assessment rubrics

Question	Marks	0	1	2	3	4	5	6
1 Identify the needs	3	No needs identified	One need identified	Two needs identified	Three needs identified			
2 List the sources	2	No source identified	Some sources identified	All sources identified				
3 Acquire data	3	No data required	Data required that meets one need	Data required that meets two needs	Data required that meets all needs			
4 Accuracy and relevance	2	No explanation about integrity of data	One integrity factor discussed	Both integrity factor discussed				
5 Prepare data	3	No evidence that data has been prepared	Some effort has been made to prepare the data	Most of the data is in a format that is useable by the software	All the data acquired has been prepared for use			
6 Techniques used	2	No techniques discussed	One technique discussed	Two techniques discussed				
7 Patterns and relationships	3	No patterns or relationships found	One pattern or relationship found	Two patterns or relationships found	More than two patterns or relationships found			
8 Functions used to identify patterns and relationships	2	No functions discussed	One function discussed	Two functions discussed				
9 Appearance design tool	3	No design tool for appearance	A design tool for appearance is present	Most of the solution is represented in the design	The solution is fully represented in the design			

Question	Marks	0	1	2	3	4	5	6
10 Functional design tool	3	No design tool for functionality	A design tool for functionality is present	Most of the inputs, processing and output have been identified	All of the inputs, processing and outputs identified			
11 Create visualisations	6	No visualisations created	Some attempt has been made to create a visualisation	A visualisation has been created that meets one of the needs	A visualisation that meets one of the needs and contains appropriate formats and conventions	A visualisation has been created that meets two of the needs	A visualisation has been created that meets two of the needs and contains appropriate formats and conventions	A visualisation has been created that meets all of the needs and contains appropriate formats and conventions
12 Evaluation criteria	3	No criteria created	One criteria created	Two criteria created	Three criteria created			
13 Evaluation strategies	3	No strategies developed	Strategy to evaluate one criterion developed	Strategy to evaluate two criteria developed	Strategy to evaluate all criteria developed			
14 Evaluation report	2	No evaluation report	Some criteria evaluated	All criteria evaluated				
Total	40							