Gymea Technology High School
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12 Enterprise Computing

Task 1: Data Analysis and Dashboard

Due Date: 12 Dec 2024

Task Distributed: 8 Nov 2024

Unit: Data Science

Task Type: Practical Project and Report

Task Weighting: 20 %

Outcomes: EC-12-02, EC-12-04, EC-12-05

Task Description:

You will be required to analyse a large dataset and develop a spreadsheet and data dashboard to identify and represent specific historical trends, as well as current data to inform potential users.

Task

We live in an age where information plays an important role in our daily and business lives. Large datasets are easily accessible to help us develop and inform our decision-making processes.

Choose a dataset that contains current and historic data, to create a spreadsheet and a data dashboard from using Google Looker Studio, Oracle APEX or one approved by the teacher.

Examples of datasets to consider include:

- weather data for a location over the last 25 or more years
- ocean temperatures from 1950 to present
- Spotify playlists from 2012 to present
- mobile phone prices and usage in Australia 2000 to present
- population density and other census data for a state from 1970 to present.

Part A:

Once you have collected your data, analyse the information using a variety of data analysis tools including:

- filtering data using pivot tables, creating charts (bar chart, column chart, line chart, scatter chart, pie chart) and applying conditional formatting
- using the ‘analyse data’ tool in Excel to analyse trends, patterns and create summaries
- using the Analysis ToolPak in Excel to perform complex data analysis (regression and a histogram)
- using a ‘What-if’ analysis to explore various results

You will also need to produce a video, no longer than 6 minutes, demonstrating and explaining the features required in the spreadsheet (see below). This should be exported as a .mp4 file.

Once you have completed your analysis:

- create a spreadsheet following the 'Steps to Success' model
- a data dictionary for your chosen dataset
- a data dashboard that best displays your findings.

Using screen recordings and video documentation, show your spreadsheet which should include the following features to demonstrate that you can:

- enter text, numeric values and formulas
- copy cells using both absolute and relative referencing
- fill down and across
- use built-in and user determined formulas, including:
    - Arithmetic: SUM, MAXIMUM, MINIMUM, COUNT
    - Statistical: MEAN, STANDARD DEVIATION
    - Logical: IF (determines a value based on a condition being TRUE or FALSE)
    - Relational operators: LESS THAN OR EQUAL TO, EQUAL TO, NOT EQUAL TO, GREATER THAN and GREATER THAN OR EQUAL TO
    - Other: LOOKUP(s) such as VLOOKUP
- import data from a variety of sources
- manipulate rows and columns of a spreadsheet and apply a variety of formats
- sort selected areas of the spreadsheet
- configure sheet layouts
- work with data across multiple sheets
- apply conditional formatting to display information
- use filters and pivot tables to display information.

Part B:
A written report investigating your origin dataset. This should address the following:

- Identifying the source of your dataset
- Explaining the reliability of the dataset
- Explaining how your data source is valid and relevant
- Investigating and discussing other reliable data sources that could correlate your data
- A summary of the story your dataset tells
- Explaining the most significant results from your dataset
- Evaluating the limits or uncertainties in your dataset. You will need to make reference to the sample size, data quality, timeliness or bias of the dataset

NESA Glossary of Key Words

Understand the verbs associated with the task. The verbs will provide an understanding of the detail needed to successfully answer the questions.

- **Define** - State meaning and identify essential qualities
- **Describe** - Provide characteristics and features
- **Discuss** - Identify issues and provide points for and/or against
- **Evaluate** - Make a judgement based on criteria determine the value of
- **Identify** - Recognise and name

Details of Submission

You are to submit all components of your task digitally, including:

Part A:

- a link to your data dashboard or file (if applicable)
- your Excel spreadsheet
- the original dataset used
- a video (no longer than 6 minutes) exported in the .mp4 format

Part B:

- a word-processed report with relevant screenshots and analysis.

Teacher Feedback and Student Self-Reflection

The task will typically be returned to students within **21 days** of the due date.

Information on how to improve will be provided through written teacher feedback and the marking criteria. Students can clarify or seek further feedback by speaking with their teacher.

Upon return of the task and teacher feedback, students will also be expected to complete the following self-reflection form, to provide them with the opportunity to reflect on the strength of their performance, as well as areas that have been identified to strengthen in future tasks - https://forms.gle/oBnPJ8EsGLTQZm7Z8

How does this link to my learning?

This task will allow students to demonstrate their understanding of theoretical concepts, providing students with the opportunity to showcase their knowledge, understanding and skills in

- appling tools and resources to analyse complex datasets
- explaining the function of data and information within enterprise computing systems and
- explaining how data is used in enterprise computing systems
- communicating computing solutions to a specific audience

Assessment Procedures

All students should be fully aware of the School Assessment Procedures for their year group. These were provided at the beginning of the school year and are available off the school website under the Learning Tab for each year group.

Marking Rubric

PART A - Data Analysis, spreadsheet and data dashboard					
CRITERIA	**1 - 2**	**3 - 4**	**5 - 6**	**7 - 8**	**9 - 10**
Filtering Data (charts)	Student attempts to create one of the required charts or no understanding of charts	Student provides one or two charts that are somewhat unclear. Chart type created is somewhat appropriate with no labels and with minimal interpretation or insight.	Student provides at least three charts that are somewhat clear and are of the appropriate type. Charts are mostly labelled with some interpretation and insight provided. Charts created on the same sheet as the data.	Student creates a range of charts that are clear and easy to interpret. Appropriate and effective chart types used. Charts are well labelled providing a clear level of interpretation and insight. Charts created on separate sheet(s).	Student provides a wide range of charts that are clearly labelled, highly appropriate and provide excellent level of interpretation and insight. Charts created on separate sheets and linked to data.
CRITERIA	**1**	**2**	**3**	**4**	**5**
Filtering Data (pivot table)	Student attempts to create a pivot table or no understanding of pivot tables	Student provides a pivot table with errors and/or is somewhat unclear. Minimal interpretation or insight provided. Data is somewhat organised.	Student provides data that is mostly organised with some inconsistencies, mostly accurate with some errors, shows some complexity, somewhat clear and readable, some interpretation and insight provided.	Student provides data that is well organised with minor issues, shows a good level of complexity and provides a clear level of interpretation and insight.	Students provides a highly relevant pivot table which shows a high level of complexity, contains no errors and provides an excellent level of interpretation and insight.
Filtering Data (conditional formatting)	Student attempts to apply conditional formatting or no understanding of conditional formatting.	Student applies basic conditional formatting or applied but does not aide in the data analysis process.	Conditional formatting highly relevant accurately applied to enhance data analysis.		

CRITERIA	1	2	3	4	5
Analysis ToolPak	Student attempts to use the Analysis ToolPak or no understanding of the Analysis ToolPak.	Student provides a basic analysis using the Analysis ToolPak. Student demonstrates a basic understanding of the Analysis ToolPak to create a histogram. Provides a basic level of interpretation and/or insight.	Student provides somewhat relevant analysis using the Analysis ToolPak. Student demonstrates some of understanding of the Analysis ToolPak to create a recession or covariance or correlation or a histogram. Provides some level of interpretation and/or insight.	Student provides a relevant analysis using the Analysis ToolPak. Student demonstrates a high level of understanding of the Analysis ToolPak to create a recession or covariance or correlation and a histogram. Provides a clear level of interpretation and insight.	Student provides a highly relevant analysis using the Analysis ToolPak. Student demonstrates an excellent understanding of the Analysis ToolPak to create a recession or covariance or correlation and a histogram. Provides an excellent level of interpretation and insight.
What-if Analysis	Student attempts to implement a what-if analysis or no understanding of what-if analysis.	Student provides a basic what-if analysis that provides little insight or little interpretation of the dataset. Formula applied with errors or applied to an irrelevant scenario given the dataset.	Student provides a somewhat relevant what-if analysis that provides some insight and some interpretation of the dataset. Formula applied with some error and/or applied to a somewhat relevant scenario given the dataset.	Student provides a relevant what-if analysis that provides insights and allows for interpretation of the dataset. Formula correctly applied to a relevant scenario given the dataset.	Student provides a highly relevant what-if analysis that provides valuable insights and excellent interpretation of the dataset. Formula correctly applied with a highly relevant scenario given the dataset.
Data Dictionary	Student provides a limited or no understanding of a data dictionary.	Student creates a basic data dictionary with a few of the required components or column headings.	Student creates a data dictionary showing some of the required components.	Student creates a data dictionary showing most of the required components and follows the course specifications.	Student creates a comprehensive data dictionary that includes all data types and follows the course specifications.

CRITERIA	1 - 2	3 - 4	5 - 6	7 - 8	9 - 10
Video	The student attempts to create a limited video (screen recording). The student attempts to capture relevant and original screen recordings related to the task.	The student creates an informative, video (screen recording). The video (screen recording) demonstrates use of some pre and post-production effects. The end product is a video (screen recording) of an elementary standard. The student provides original screen recordings that they have captured.	The student creates a substantial and informative video (screen recording). The video (screen recording) demonstrates reasonable quality in some aspects of its production including pre and post-production effects. The end product is a video (screen recording) of substantial standard. The student provides a range of original screen recordings that they have captured.	The student creates a well-developed, informative, and entertaining video (screen recording). The video (screen recording) demonstrates reasonable quality in every aspect of its production including a range of pre and post-production effects. The end product is a video (screen recording) completed to a high standard. The student provides a wide range of screen recordings that they have captured.	The student creates an outstanding, informative, and entertaining video (screen recording). The video (screen recording) demonstrates quality in every aspect of its production including a range of pre and post-production effects. The end product is a video (screen recording)of professional standard. The student provides an outstanding range of original screen recordings that they have captured.
Video (Voice)	The student attempts to provide a narration using their own voice or uses AI for the narration.	The student provides a limited narration or spoken words are hard to understand and are unclear.	The student provides a clear voice which is easy to understand and is delivered with an appropriate pace and volume using their own voice.	The student provides a detailed narration which is clear and easy to understand throughout the video and the student uses their own voice. Audio clarity is of a high standard.	The student provides an extensive and detailed narration using their own voice. The student's voice is easily understood, delivered at a highly appropriate pace and volume. Audio clarity is of a professional standard.

Data Dashboard	Student attempts to implement a data dashboard or no understanding of data dashboards.	Student creates a basic or incomplete data dashboard that includes one or two charts and/or tables. Provides little insights into the dataset and has a poorly designed user interface. Data dashboard partly functions and/or contains errors.	Student creates a effective data dashboard that includes some charts and tables. Provides some insights into the dataset and has a sound user interface. Data dashboard functions correctly.	Student creates a highly effective data dashboard that includes a range of charts and tables. Provides relevant insights into the dataset via clear, professional user interface. Data dashboard has good functionality.	Student creates a comprehensive data dashboard that includes a wide range of charts and tables. Provides highly relevant insights into the dataset via clear, professional and easy to use interface. Excellent functionality.
Spreadsheet (formatting and cell reference)	The student creates a spreadsheet with few features; lacks data manipulation skills. Copies data into Excel.	Student applies basic formatting to parts of the spreadsheet. Student attempts to use fill down or across functions to limited parts of the spreadsheet. Copies data into Excel. Attempts to manipulate a few rows and columns and applies limited formatting. .	Student applies some formatting to the spreadsheet. Student attempts to use relative and/or absolute cell referencing Student attempts to use fill down and across functions to some parts of the spreadsheet. Imports data into Excel. Attempts to manipulate some rows and columns and applies some formatting.	Student uses appropriate formatting applied to colour, headings, text size, layout High level of skill shown in the use of relative and absolute cell referencing Uses fill down and across functions to most parts of the spreadsheet. Successfully imports csv dataset into Excel. Manipulates most rows and columns and applies formatting options.	Highly effective use of appropriate formatting applied to colour, headings, text size, layout Advanced skills is the use of relative and absolute cell referencing. Effectively uses fill down and across functions Successfully imports csv dataset into Excel. Manipulates rows and columns and applies effective formatting options.
Spreadsheet (functions and operators)	The student creates a spreadsheet with few functions; lacks logical operators or no understanding of functions and logical operators.	Student attempts to use some inbuilt functions such as SUM, AVERAGE. Student attempts to apply one or two logical operators to a limited number of IF statements. IF statements contain syntax errors and/or logical errors.	Student applies some functions including inbuilt and user created. Student applies some logical operators to some IF statements to produce results that may aid in data analysis processes.	Student successfully applies a range of appropriate functions including both inbuilt and user created. Student successfully applies a range of appropriate logical operators to IF statements to produce relevant results.	Student successfully applies a wide range of highly appropriate functions including both inbuilt and user created. Student successfully applies a wide range of highly appropriate logical operators to IF statements to produce highly relevant results.
					Part A TOTAL / 83

PART B - Report					
CRITERIA	**1 - 4**	**5 - 8**	**9 - 12**	**13 - 16**	**17 - 20**
Report	The student selects an inappropriate dataset; lacks justification and does not meet project requirements. The student demonstrates limited knowledge and understanding of enterprise computing concepts and/or solutions. The student demonstrates a limited ability to collect complex data. An analysis is not evident. The student communicates with a limited range of terms. Minimal research and planning occur with unclear or missing explanations of data sources and security measures.	The student communicates using basic terms and or conventions. Inadequate research and planning occur with weak explanations of data sources and security measures. The student selects a dataset with limited relevance; provides a basic justification and partially meets project requirements. The student demonstrates basic knowledge and understanding of the application of data, tools and resources The student demonstrates a basic ability to collect, analyse and/or use complex data.	The student communicates using relevant terms, conventions and methods. The student provides sound research and planning; explains data sources; explains reliability, significance, limits and validity with some clarity. The student demonstrates a sound ability to collect, analyse and use complex data effectively. The student selects suitable dataset; provides some justification and meets some project requirements. The student demonstrates sound knowledge and understanding of the application of data, tools and resources in developing enterprise computing solutions.	The student communicates logically using appropriate terms, conventions and methods. The student completes detailed research and planning; adequately explains data sources; explains reliability, significance, limits and validity. The student demonstrates the ability to collect, analyse and use complex data effectively. The student selects relevant dataset; provides good justification and meets most project requirements. The student demonstrates a thorough knowledge and understanding of the application of data, tools and resources in developing enterprise computing solutions.	The student communicates logically and effectively using a range of terms, conventions and methods. The student thoroughly investigates and documents data sources; clearly explains reliability, significance, limits and validity. The student demonstrates the ability to collect, analyse and use complex data logically and effectively. The student selects highly-relevant datasets; provides strong justification and meets all project requirements. The student demonstrates an extensive knowledge and understanding of the application of data, tools and resources in developing enterprise computing solutions.
				Part B TOTAL	**/ 20**
				OVERALL TOTAL	**/ 103**