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Capstone 1 Rubric

Changes last recorded April 9.

Functionality	1	2	3	4	5	Score	Weight	[Change Log]
UI	Non-existent or non-functioning UI		UI is unclear, needlessly cluttered, yet mostly functional		UI is clean, simplistic, and transparent in the data being collected			
Database UI OLTP	Does not demonstrate a clear understanding of data mapping, such as errors in data type choices		Demonstrates some understanding of data mapping, but with some mistakes		OLTP understanding is demonstrated via clear mapping of UI to database schema			
	No mitigation for error - used basic text fields for everything - doesn't check any data types from the inputs		Commits peform successfully with minimal room for error, but no pop-up notice in the event the commit fails (no notification to the user that something happened - no messaging or communication with the user)		Commits perform successfully and with minimal room for error and a pop-up notice in the event of a commit failing			
Database	Database falls short of having a star schema data structure or multiple tables		Database includes many of the data structures they scoped for, but some missing or incomplete - minimum one incomplete star or snowflake schema, minimum two tables total.		Database includes all the data structures that should be present in the appropriate tables as required by their system - minimum of one complete star or snowflake schema, minimum of four tables total, one aggregation, and minimum one OLAP-style denormalized table (e.g. Cross-tab of Sales by date by employee)			Apr 9: include snowflake as valid schema option.
			Database is populated by only one distinct data source		Database is populated by two data sources (historical + UI).			
Jupyter Notebook	A database quality checker is provided but is not consistently able to show relevant database info.		A database quality checker is provided that shows some column names and data types, but not common joins.		A database quality checker is provided that runs test to provide a birds-eye view that each database table is stable in terms of column names, data type consistency by column, and demonstrates a few common joins.			
Excel Dashboard	Dashboard has no data connection pre-existing in the workbook or student is unable to demonstrate the use of data connections		Dashboard has proven functionality for the sales manager to initiate their own pivot tables and charts using only one existing data connection and during the presentation, the student demonstrates use of the data connection		Dashboard has proven functionality for the sales manager to initiate their own pivot tables and charts using two or more existing data connections and during the presentation, the student demonstrates use of the data connection. *Live data connection is not required on Mac.			
Analysis Findings	No visual aides, no statistical basis for any dashboard elements		Demonstrates they can generate visual aides, but lacks in statistical basis for choice of visuals		Demonstrates a statistical mindset: shows findings with the aid of specific visuals that demonstrate actionable insights related to historical modeling and basic forecasting			
					Section Total (out of 2.5):	0	50%	
Quality							Quality Weighting	100%
Data Visualization Principles	Failed to demonstrate an understanding of data visualization principles - e.g., poor use of colors, unclear legends		Demonstrates some understanding of data visualization principles but may have missed on some principles. (Visual Perception: order, hierarchy, clarity, relationships, convention)		Demonstrates clear understanding of fundamental data visualization principles (covered in 1st half of course)		10%	
Structure and Logic	Comments nonexistant		Minimal comments included but could be improved upon		Clear, meaningful, and useful comments used throughout the codebase		5%	
	Data modeling: Minimal effort to appropriately name database objects, functions and/or variables		Data modeling: Mixed use of appropriate name choice for database objects, functions, and/or variables		Data modeling: Well-chosen names for all database objects, functions, and variables		5%	
Database Design					Database design choices for keys, datatypes and other constraints are clear and justified. A rudimentary database EER diagram is provided, using a simple PowerPoint slide or tool such as LucidChart.		5% 5%	
Excel - Data Wrangling	Minimal or no success converting data into a loadable format.		Partially successful conversion of data provided in Excel format to a loadable format.		Successful conversion of data provided in Excel format to a format suitable for loading to a database.		3%	
Excel - functions	poorly written functions that break often and have poor error handling		Functions, where used, are somewhat well structured, but have some room for improvement		Functions, where used, are well structured and optimized		3%	
Excel - charts	Minimal or no use of charts		One or more charts are used, but no statistical finding is present		One or more charts are used to plot a statistical finding		3%	
Excel - data tables and power query	Does not connect Excel to SQL server or any other file type using Power Query		Connects Excel to MySQL server using Power Query, but does not employ the use of any Power Query statements beyond the auto-generated "Source" and "Change Data Type" statements.		Appropriately connects Excel to MySQL server and one other file type, such as a flat file or another Excel file. Has a mixed use of basic Power Query statements.		3%	Apr 9: Clarified MySQL Server (instead of SQL Server), and added language about Power Query statements.
Excel - Pivot tables, pivot charts	No use of pivot table or pivot chart		There is at least 1 pivot table + pivot chart combination present, with only default formatting		There are 3 or more pivot table + pivot chart combinations, each with distinct chart types, yet consistent formatting. When changing filter choices, there are no collisions between pivot tables		3%	
Excel - slicers	No use of slicers		Excel dashboard has one slicer minimum with connection to one pivot table + pivot chart combination		Excel dashboard has one or more slicers with connections to multiple pivot table+pivot chart combinations		2%	
SQL	Choice of SQL operations and functions aligns poorly with desired outcome, with significant flaws in performance and readability		Mixed use of appropriate SQL operations and functions for each procedure implemented, but with notable performance and readability shortcomings		Uses the appropriate SQL operations and functions for each procedure implemented taking into account basic performance and readability		10%	
Jupyter Notebook					Data quality checker includes comment cells that explain what each section of the code does. User should be ready to start/restart Jupyter Notebook from the command line / Terminal, be that the stock CLI or one embedded in their IDE.		10%	Apr 9: Added specific requirement to "be ready to start from command line" so that the student has the opportunity to demonstrate a basic understanding of CLI.
Python ETL (Data Injection)	Code is not functional		Has functional code that has some logical fallacies or is uncommented/unexplained		Has clean commented code that is functional for the processes being run		10%	
					Specifically uses some Python Library for batch injection into database		10%	
Python Flask					Specifically uses Flask library for UI, and SQLAlchemy for database CRUD.		10%	
Exception Handling/ Defensive Coding	App breaks / crashes frequently, based on user input		A few major exceptions are handled and/or logged, but App may still crash occasionally		App does not crash with missing data or bad user input.		3%	
					Section Total (out of 1.25):	0	25%	
Presentation								
Usability, UI/UX	Interface poorly laid out		UI is functional and behaves as expected		User interface is clean and professional			
	User would struggle to use this application		Usage is mostly intuitive, but with noticeable shortcomings easily discovered		Usage is intuitive and the application is easy to use			
Planning Process	Presentation does not address the planning process or dismisses the suggestion of iterative development		Presentation addresses the planning process, but minimally addresses impediments or an iterative process to solving problems encountered		Presentation includes an explanation of the problem solving/planning process taken. E.g., how did you approach problems and solve them iteratively? How did you react to unforseen impediments?			Apr 9: Took out explicit requirement for a slide to avoid contradicting the Capstone 1 Requirements document. Use of a slide in the appendix is suggested but not required, as with all other appendix documents. The counterfactual I shared in class was that when I presented my mock lecture during my job interview, I suspected that when I mention database engines that they would follow up with questions. I came prepared by having MySQL already open, writing the "show engines" statement from memory, and talking about the engines from there. Doing so demonstrated I could think on my feet and knew how to use the tools I was talking about. Bit of a gamble.
	No reflection and/or refactoring		Minimal areas of reflection and/or refactoring		Clearly and honestly indicates areas of reflection and/or refactoring (e.g., what would you do differently if you knew then what you know now? With more time, what more would you do with this? Could you see this scaling out into a bigger project?)			
Class Presentation	Student had to stop to make adjustments that didn't add value to the presentation (e.g., loading programs unnecessarily, crashing programs, finding presentation material, etc.)		Presentation was completed within the allotted time (15? minutes) and covered all points expected. But, the presentation had a few bumps. (For example, it didn't flow naturally or there were stops and starts or the presenter lost their place)		Presentation was engaging and interactive - It was well rehearsed, clear, and flowed naturally through the features			
	Student could not clearly present the data or analytic findings when asked		Student was able to answer technical questions correctly or was at least on the right track		Presentation was persuasive when presenting analytical findings. Student was able to provide clear and insightful responses to technical questions			
					Section Total (out of 1.25):	0	25%	