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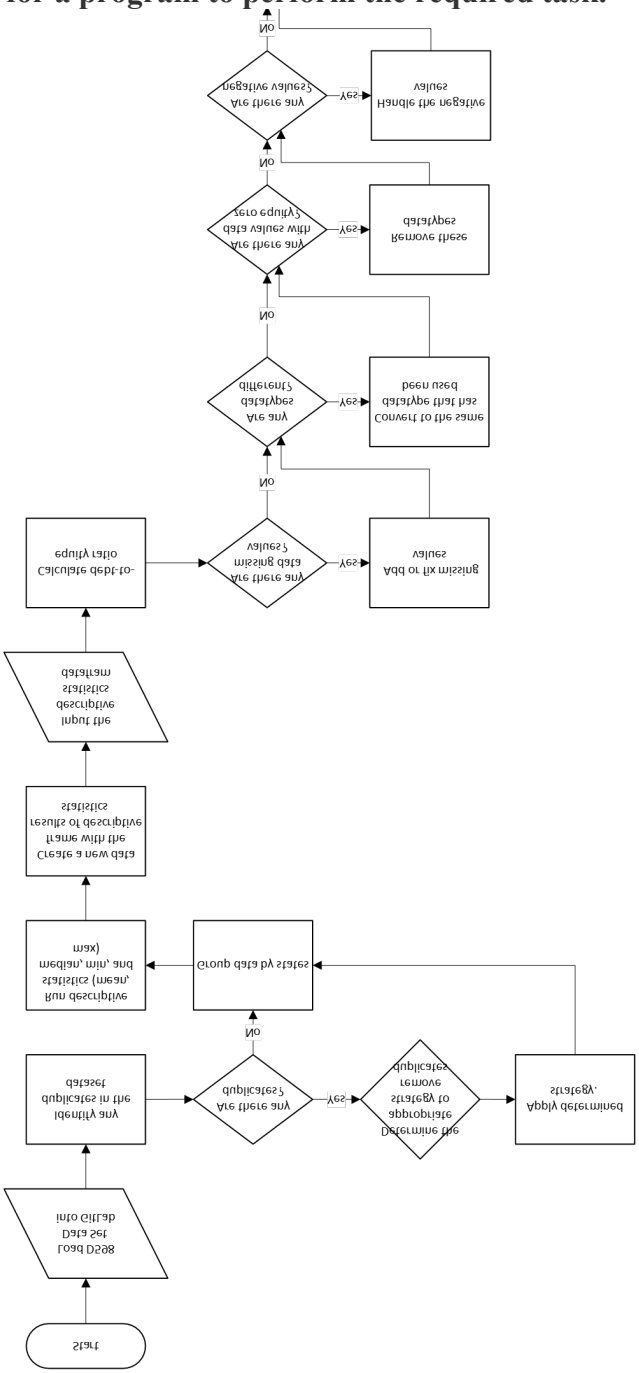
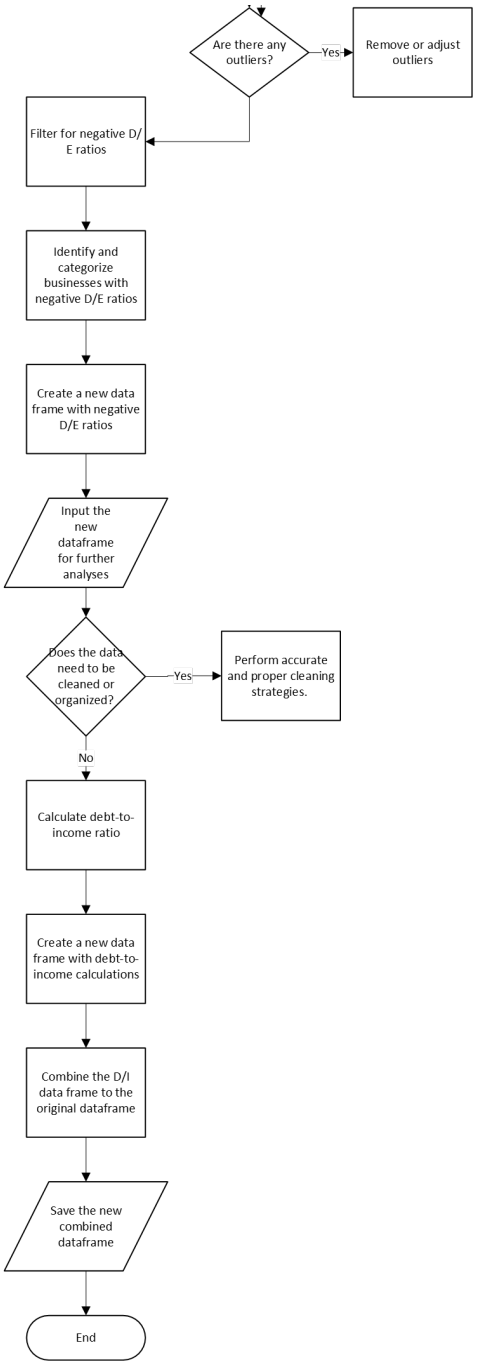
D598 – Analytics Programming
DATE

Task 1 – Program Planning

A. Create a flowchart for a program to perform the required task.





B. Write pseudocode for a program to perform the required task.

START
Load the dataset
Remove duplicate rows
Group dataset by ‘state’ column
    Calculate the mean, median, min, and max
    Save results in a new data frame
Calculate debt-to-equity ratio

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    Check for missing or invalid data values
    If invalid data exists:
        Handle or remove invalid data entries
    ENDIF
        Calculate debt-to-equity ratio
        Remove outliers
Filter for negative D/E ratios
    Filter to find businesses with negative D/E ratios
    Store results in a new data frame
Calculate debt-to-income ratios
    If invalid data values are present:
        Handle or remove invalid entries
    ENDIF
        Calculate debt-to-income ratio
        Remove outliers
Combine data frames
    Combine debt-to-income data frame to the original data frame
Output the results
    Save or analyze the new data frame
END
```

C. Explain the relationship between the flowchart and pseudocode that does the following:

1. Describe the logic behind the flowchart and pseudocode.

Before beginning a new coding project, developing a visual representation of the path the code might follow is essential. These representations may come in the form of flowcharts and pseudocodes.

Flowcharts are the first step in developing a step-by-step process for the programming project. This visual tool demonstrates inputs/outputs, decisions that need to be made, what solutions may be used, processes, and other flows that will be seen. Flowcharts are perfect at illustrating the methods a programmer will follow and communicating to the rest of the team members what may happen during the project (Western Governors University, 2020).

After creating the flowchart, pseudocode will be developed. This tool is the closest thing to the coding language that someone can get without using a coding language. By breaking the flowchart into easily digestible words, team members will understand clearly what steps will need to take place during the project's development. Additionally, pseudocode will allow room for a deeper understanding of the code itself and add to troubleshooting and other clarifications that will take place (Western Governors University, 2020).

2. Explain the alignment between flowchart and pseudocode.

Together, flowcharts and pseudocodes contribute to a better understanding of the process and flow that will be used throughout a programming project. Flowcharts are a visual representation of that path, while pseudocodes are a verbal representation. Both are necessary to help fully comprehend what inputs will be made to complete the project's development.

Flowcharts are a descriptive visual tool that illustrates the path of the project while making sure to include representation for crucial steps. Parallelograms show that there will be an input or output of data, and diamonds show that a decision will need to be made. This tool is helpful for beginners because it is so easy to understand. While flowcharts are descriptive, there is a limit to how much detail is included; crucial steps are illustrated, but extra steps and detailed operations are not included.

Pseudocodes are a written or verbal representation of the project's flow. At first glance, this tool looks very similar to a coding language in format, indentations, and inclusion of statements like "ENDIF." When compared to flowcharts, pseudocodes can go further into detail on the steps that should be made by having the ability to include substeps. Pseudocodes are easier to understand for someone who has had previous coding experiences.

Using both tools, the project process can be communicated to various audiences and help prepare the individual for the coding project.

D. Acknowledge sources, using in-text citations and references, for content that is quoted, paraphrased, or summarized.

Western Governors University. (2020). *Flowcharts. https://apps.cgp-oex.wgu.edu/wgulearning/course/course-v1:WGUx+OEX0375+v01/block-v1:WGUx+OEX0375+v01+type@sequential+block@a32c6434eb994cd48d84d7890c37b6a4/block-v1:WGUx+OEX0375+v01+type@vertical+block@8c1fcc368d8c46228a52a7aed6bea1a2*

Western Governors University. (2020). *Pseudocode*. https://apps.cgp-oex.wgu.edu/wgulearning/course/course-v1:WGUx+OEX0375+v01/block-v1:WGUx+OEX0375+v01+type@sequential+block@a32c6434eb994cd48d84d7890c37b6a4/block-v1:WGUx+OEX0375+v01+type@vertical+block@e2a36905ac0c44db8bc68a6ff80b1f5f