Due to this project being a school project, Github/Code is hidden. But here is the README for you to read!!

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Solution:   Spreadsheet
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Upon running our spreadsheet GUI design project, a window of a spreadsheet will appear with the search bar, cell name, cell value and cell content bars above the grid. By default, the spreadsheet grid and the search bar are clear and the displayed cell is first selected to A1 with an empty string cell value and cell content.

Some functionalities implemented into our spreadsheet includes, but not limited to:

- Select cell
- Evaluate the cell's content in the selected cell
- Update the cell's value according to the selected cell's dependencies
- Warning and error message for invalid formula and formula error inputted
- New, open, save and help menus
- Additional feature: Search bar

SpreadSheet Further Explanation:

The selected cell's features will be displayed in the cell name, cell value and cell content bars. Every time a cell is selected, the focus will be directed to the selected cell's content bar for the users to input the cell's content to be evaluated and the result value will be displayed in the selected cell's value bar. For every input entered - indicated by the return key being pressed - the inputted cell's content will be evaluated according to its type. A string and a double content will set the cell's value into the same string and double respectively. Whereas if formula is inputted - indicated by the "=" at the start - our program will first check its validity (i.e check all variables included are valid and formula is in the right format). If it's not valid, our program will raise a pop-up alert box warning the users of the error exception found in the formula inputted. This can include, but not limited to, invalid formula format and circular dependencies. If the user inputs a valid formula, only then it is evaluated to produce either a double if successful or a Formula Error, if failed. This may be caused by undefined variable value or division by zero. Once it's successfully updated or edited, this updates all the cells that have

dependencies on the current selected cell using the evaluated value.

If any Exception is detected, a warning box will pop up alerting the user about the error and the cell content and value will return to the previous valid cell value and content. Thus, nothing has changed. If a Formula Error is detected, "FORM. ERR." will be displayed in the cell grid and cell value bar.

In the menu bar, we provided 4 features: new, open, save and help. New will set the spreadsheet back to the clear default settings. However, if new is called when the user is modifying the current spreadsheet, a message box will pop up asking if the user wants to save the current modified spreadsheet and warns them if they don't, all modified data will be lost. Open allows the user to open a spreadsheet file (.sprd) from their local device to the spreadsheet window. Save menu pops up a box for the user to enter the specified filename path directory will be saved on for the current spreadsheet.
If any exception occurs while either opening or saving a file, a display pop up is shown. Help provides a guide for the users to navigate through our spreadsheet.

Additional feature we implemented is the search bar. It consists of the switch toggle, stepper button and the search entry box. The user can either search for a cell name in the search entry box, if the switch toggle is turned off or a value if the switch toggle is turned on. For every cell that has the searched value, the user can navigate through them using the stepper â€˜-+â€™ button, which works just like a previous and next button.

Problems:

Some major problems we encountered when designing this spreadsheet project are handling the formula error and exceptions and circular dependencies. We were struggling for quite some time to synchronize the cell value and the cell grid view when formula error was found. In addition, saving the cell content for when Formula Error is found was quite an issue for us. Furthermore, our program could not detect the circular dependencies and gave us an infinite loop.

This submitted spreadsheet program works as described above and all issues mentioned have been handled accordingly.

Special Instruction for General Use:
For the use of Pop up window for help instructions, additional nuget packages were added. CommunityToolKit.Maui 1.3.0 was added and implemented into the code so it may be required to download the corresponding nuget package for general use.

External Code Resources:
    -https://learn.microsoft.com/en-us/dotnet/maui/ - Used Microsoft website for most code resources
    -https://www.youtube.com/watch?v=yM7opXlu-MU&ab_channel=GeraldVersluis