Student Grading Application

**Developer’s Documentation**

About the Developer

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Brief Summary of Implementation

This program was written with the idea of “One Form, Many Subs” in mind. It revolves around one User Form that interacts with the user. This form contains buttons for each of the program’s commands and each button has its own Module containing subroutines used to carry out its respective button’s tasks.

Each code module will now be summarized with a table of descriptions of each of its subroutines:

frmMain

See the application overview for a more thorough description of each command.

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| --- | --- |
| Subroutine | Description |
| UserForm\_Initialize | Called upon initialization of frmMain, connects to the database to fill the course combobox and fills the assignment listbox with the default assignment names |
| btnNewCourse\_Click | Add New Course button |
| btnImport\_Click | Import Data button |
| btnView\_Click | View In Excel button |
| btnAddStudent\_Click | Add New Student button |
| btnReport\_Click | Generate Word Report button |
| btnSave\_Click | Save button |
| btnExit\_Click | Exit button |
| DisAssGrades | Wrapper subroutine for DisplayAssignmentGrades. This was written as said sub is used in more than one place and has a lot of cumbersome arguments |

Utility Subs

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| --- | --- |
| Subroutine | Description |
| CreateSheet | Creates a worksheet with the given name (assumed to not already exist.) It is then placed as the last worksheet (to the right of the others.) |
| ClearSheets | Deletes all worksheets except the main sheet. |
| DeleteSheet | Deletes a worksheet with the given name (if it exists, otherwise it does nothing) |
| CountLines | A Function that returns the number of lines in a file, taking into consideration whether it has a title line, and the fact that its value will be used by a 0 based array |
| AverageTo2Places | A Function that returns the Average value of a Range rounded to 2 decimals. Doesn’t actually work. |
| SDTo2Places | A Function that returns the Standard Deviation of a Range rounded to 2 decimals. Doesn’t actually work. |
| LinearSearch | Searches an array for a value, returns its index if found, -1 otherwise |
| GetSheetName | Obtains the name of the worksheet associated with a given assignment name. |
| BeheadAndUngridSheet | Removes the gridlines and row/column headings from the sheet currently being viewed |
| MsgArray | MsgBoxes the contents of a given array. Used mainly for debugging purposes. |

Add New Student Subs

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| --- | --- |
| Subroutine | Description |
| InsertStudent | Prompts the user for information on the new student they want to add and inserts it into frmMain’s student arrays.  Returns True if a new student was added, False if the user decides they don’t want to input a new student after all. |
| GotInput | A Helper Function for InsertStudent. Prompts the user for a string and updates the new student info array, returns True if they enter something, False otherwise. |
| GotIntInput | A Helper Function for InsertStudent. Prompts the user for an integer and updates the new student marks array, returns True if they enter a valid integer, False otherwise.  Contains Error Handling. |
| Import Subs   |  |  | | --- | --- | | Subroutine | Description | | OpenFile | Displays a file dialog prompting for a csv file and then fills frmMain’s student arrays with the file’s records. Returns True if a file is chosen and successfully imported from, False otherwise | | DisplayAllGrades | Takes frmMain’s student arrays and generates a worksheet showing a table of names and all grades. | | |

Initialize Subs

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| Subroutine | Description |
| CN\_Initialize | Initializes the database connection to connect to registrar.db |
| GetCourses | Uses the database connection to get the courses and fill the combobox |
| SetDefaultNameFormat | Fills the name format array with its defaults |
| SetDefaultAssignments | Fills the assignment name array with the default assignment names |
| FillListBox | Puts the assignment names into the listbox |

New Course Subs

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| --- | --- |
| Subroutine | Description |
| GetCourseInfo | Prompts for information on a new course and inserts it into the passed array. Returns True if successful, False otherwise |
| UpdateCourseDBase | Updates the database with the new course |
| GotInput | A Helper Function for getting string input from the user. Returns True if input is received, False otherwise. |

Save Changes Subs

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| --- | --- |
| Subroutine | Description |
| UpdateFile | Appends new student record information to the file from which the records were imported. |
| FillInArray | A Helper Sub used by UpdateFile that obtains information on an individual student in a 1-D array |

View In Excel Subs

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| --- | --- |
| Subroutine | Description |
| DisplayAssignmentGrades | Generates a worksheet with student names and marks for a specific assignment as well as a histogram (and class average & standard deviation if specified) |
| MakeHistogram | Computes the frequencies of each grade range and then calls MakeHistGraph to make the chart |
| GetLabels | Obtains the labels used in the histogram in array format |
| MakeHistGraph | Makes a Bar Graph using the labels and bin frequencies and then sets its horizontal gap to 0 to make it a histogram. |

Word Subs

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| Subroutine | Description |
| MakeTitle | Creates the title string that will be typed into Word. The title is based off of the course name |
| TypeBoldTitleIntoWord | Types a bolded string into Word with Title style |
| TypeTitleIntoWord | Types a string into Word with Title style |
| CopyChartIntoWord | Copies a chart from Excel and pastes it into Word. There is no link established between the two so if the user deletes the one in Excel, the chart in Word remains intact. |
| TypeValueIntoWord | Types a number and its label into Word |
| TypeTableIntoWord | Types a 2 column table of bin labels and frequencies into Word |
| InsertTableIntoWord | Used as a Helper Sub to TypeTableIntoWord, inserts a 10 x 2 table into Word |

Main Program Subs

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| --- | --- |
| Subroutine | Description |
| Main | Shows frmMain, thus running the Main Program. |

Areas of Improvement

The developer usually holds his software to high standards but unfortunately due to time constraints and other commitments was unable to get this application quite the way he wanted. The following is a list of a few improvements that could be made to the program.

More Database I/O: at the moment, the program does read and write from a database, but this is only for the course names and codes and makes the program less useful as writing student grades into csv files can be aggravating.

More Flexibility: the program works fine for students that only have Names and IDs and only have marks for A1, A2, A3, A4, M1 and the Final Exam but this is not very general. An ideal program would have an options pane which would allow the user to specify the format that their data will be in.

User Defined Types: frmMain makes use of Global Variables and parallel arrays to get the job done. These are very primitive programming practices that can make the code very hard to follow (and burdens the reader with lots of things to remember) a better solution would be to have the form as some sort of Object.

Program Flow: Using one User Form makes things simple for the coder, but the user may find it confusing to use. “What should I click first?” and “Oh oops, I wanted my Word report to be for CP212, not CP102” are some common experiences that the user may have with the program.