BestXYZ Processor

Requirements, Design, Implementation, Testing (RDIT)

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| User Story | Text |
| OUTPUTFILE | The user was able to specify an Output File in the main window by direct entry |
| OUTPUTSELECT | The user was able to select an existing Output File in the main window by browsing |
| OUTPUTAUTO | The user was able to have the program create an Output File name from the Input File name, by browsing for the Input File in the main window |
| LOGDATA | The user was able to create an ASCII text log file containing the dataset start and end times (GPS and UTC), the total number of records processed, and the percentage of records with an RSS over 0.5 meters |

1. Requirements
   1. The user is able to type an output file path into a text field on a GUI interface
   2. The user is able to browse for an output file through a standard save file dialog
   3. The user is able to leave the output file path empty and the application will create an output file based on the input file name
   4. The user is able to type a log file path into a text field on a GUI interface
   5. The user is able to browse for a log file through a standard save file dialog
   6. The user is able to leave the log file path empty and the application will create a log file based on the input file name
   7. A log data output file is populated with start time(GPS and UTC), end time(GPS and UTC), number of records processed, and percentage of records with an RSS over 0.5 meters
2. Design
   1. Use a framework to create a main GUI dialog
   2. Add text entry fields to allow the user to type in output and log file paths
      1. The text entry fields will have placeholder text until the fields are otherwise populated
   3. Add buttons to the main GUI dialog to allow the user to browse for an output and log file
      1. Browsing for a file will populate the corresponding text entry field
   4. If processing is started with an empty log and/or output file path, then blank values are filled with generated paths
      1. For empty output paths, the newly generated output file will be “<input file>\_Output.txt”
      2. For empty log paths, the newly generated log file will be “<input file>\_Log.txt”
   5. At the end of a successful run, the log file will contain elements: start time(GPS and UTC), end time(GPS and UTC), number of records processed, and percentage of records with an RSS over 0.5 meters
3. Implementation
   1. Create a QT Window
   2. Add two QTextEdits that have example file paths as placeholder text
      1. Filling in the text entry fields removes the placeholder text
   3. Add two QButtons to the GUI
      1. Upon clicking a QButton prompt the user with a save QFileDialog
      2. Browsing for an output or log file populates its corresponding QTextEdit field and highlights the border of the QTextEdit green
   4. If an invalid file path is entered into the output and/or log file paths, then upon processing a QMessageBox error message will prompt the user to select a different file
      1. The border of the QTextEdit fields with incorrect file paths will be highlighted red
   5. If processing is started and the output and/or log file entry fields are left blank, then a file will be generated for the blank entry fields
      1. For empty output paths, the newly generated output file will be “<input file>\_Output.txt”
      2. For empty log paths, the newly generated log file will be “<input file>\_Log.txt”
   6. While processing, the application will note the first time as start time and routinely track the end time, record count, and count of RSS>0.5m for BestXYZ messages
      1. The UTC times are calculated by using the UTC offset from the TIME messages and the GPS time from the BestXYZ messages
      2. The percentage of records with an RSS > 0.5m is calculated at the end of processing
      3. At the end of processing all of this data is written out to the log file
4. Testing  
   Test Setup: A computer with the BestXYZ Processor application loaded and containing at least one reference receiver dataset.
   1. Open the BestXYZProcessor application
   2. Verify that Output and log File text entry fields are present on the GUI
   3. Verify that the user can type into the text entry fields
   4. Verify that buttons with a folder icon exists to the right of the log and output file text entry fields
   5. Use each folder button to pop up the standard save file dialog
   6. Cancel the dialog, verifying that no file path is entered in the corresponding text entry field
   7. Choose a valid file path for the input file and then type an invalid file path for the output file text entry field. For Example: “203ijndf<”
   8. Click the “Process” button and verify that a QMessageBox error message prompts the user
   9. Repeat steps 4.7 and 4.8 for the log file
   10. Use the browse dialog to select a valid path and verify that the path is automatically populated into the corresponding text entry field
   11. Verify that the border of the text entry field is changed to green
   12. Process the data and verify that the output file is populated with the calculated and parsed information from the Novatel messages
   13. Verify that the log file is populated with information
   14. Clear the log and output entry fields and begin processing again
   15. Verify that the log and output entry fields are automatically populated, and a file name is generated based on the input file name. For Example: inputFile = “Hello.txt”, outputFile = “Hello\_Output.txt”, and logfile = “Hello\_Log.txt”
   16. Verify that the files were created and populated with information
       1. Populated log records are start time(GPS and UTC), end time(GPS and UTC), number of records processed, and percentage of records with an RSS over 0.5 meters