1. Title Page:
   Project Title: Gun Violence in the USA - Data Management and Analysis
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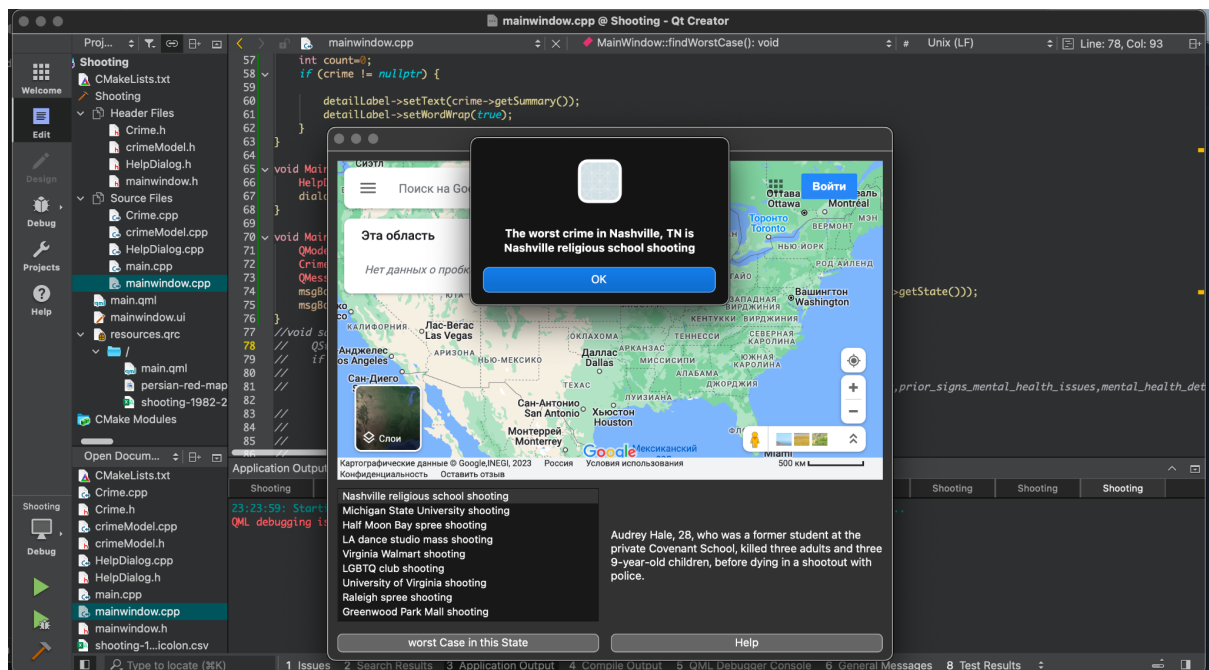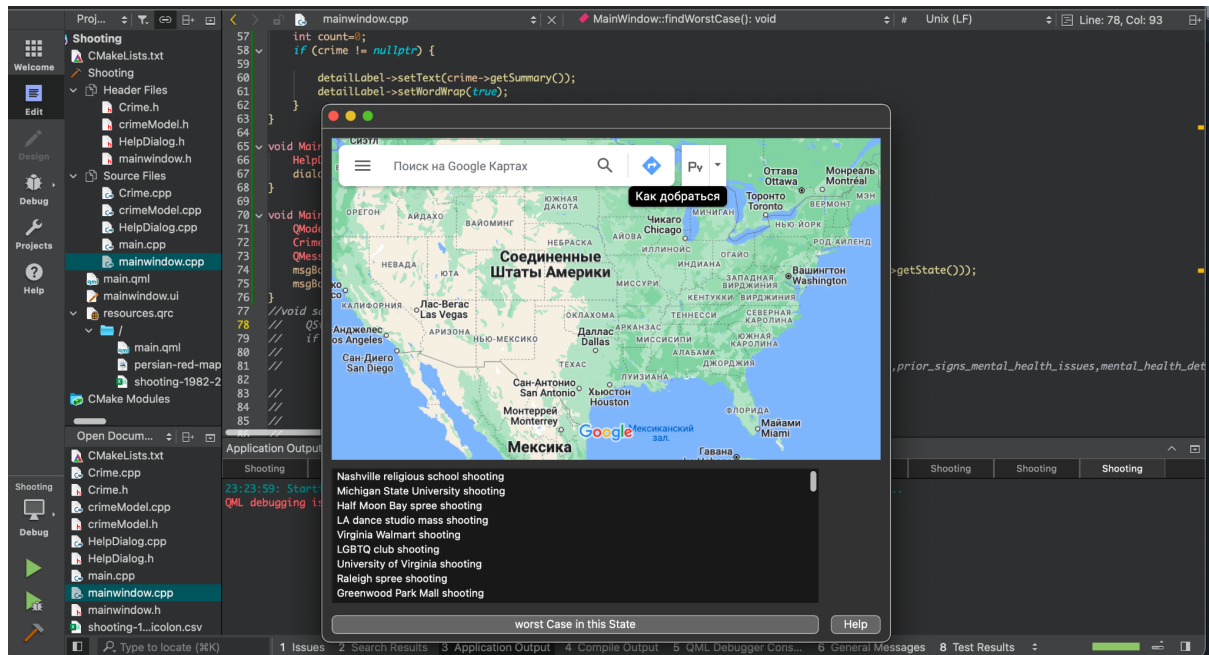   Submission Date: 10th June, 2023

2. Problem Statement:

   The problem being addressed in this project is the need to comprehend and analyze the consistencies and developments associated with mass shootings in the United States. The goal is to develop a GUI application that manages data on gun violence incidents and provides insights into patterns and trends in order to make predictions about future occurrences. The application should also support multiple languages and include a map visualization feature.

3. Implementation Details:

   The project utilizes the Qt framework to develop a graphical user interface (GUI) application in C++. The application consists of a main window that displays a map of the United States, highlighting the locations of mass shootings using latitude and longitude coordinates. The user can click on a specific location on the map to view information about the corresponding shooting.

   Key implementation details:
   - The application utilizes the QWebEngineView class to display the map, which is loaded from a URL.
   - Data on mass shootings is managed using a custom CrimeModel class, which is responsible for providing data to the QListView widget.
   - The CrimeModel class uses a QList<Crime*> to store instances of the Crime class, representing individual shootings.
   - The main window includes a QListView widget to display a list of shootings, and a QLabel widget to display detailed information about a selected shooting.
   - The application provides buttons for finding the worst shooting case in a specific state and accessing the help dialog.

GitHub Repository:
https://github.com/lizanik25/dsba-itop2023-h

4. Results and Discussion:
   During the development process, the implementation successfully achieved the objectives of managing data on gun violence incidents and providing a user-friendly interface for analysis. The utilization of the Qt framework allowed for easy integration of web-based components, such as the map visualization.

   Some of the key results and discussions include:

- The integration of the QWebEngineView widget with the map URL provided a seamless map visualization experience, enhancing the user's understanding of the geographical distribution of shootings.
   - The CrimeModel class effectively managed the data on mass shootings, allowing for easy retrieval and display in the QListView widget.
   - The selection mechanism in the QListView widget triggered the update of the detailLabel, providing detailed information about the selected shooting.
   - The buttons for finding the worst shooting case in a specific state and accessing the help dialog added functionality and improved user interaction.

   However, there are areas that can be improved:
   - The project could benefit from additional error handling and validation to ensure the smooth functioning of the application, such as handling cases where the map URL fails to load or when data is missing.
   - The application's predictive capabilities could be further enhanced by implementing machine learning algorithms to identify patterns and make accurate predictions about future trends in gun violence incidents.

5. Conclusion:
   In conclusion, the developed GUI application effectively addresses the problem of managing and analyzing data on gun violence incidents in the United States. The application provides a user-friendly interface, supports multiple languages, and offers a map visualization feature. The successful implementation of various components, such as the CrimeModel class and the integration of web-based components, contributes to the application's functionality and usability.

Potential improvements include refining error handling, implementing machine learning algorithms for prediction, and enhancing the overall user experience. By further developing these aspects, the application could become a valuable tool for researchers, law enforcement agencies, and policymakers in understanding and addressing the issue of gun violence in the USA.