**QUIZ BOT (Group - 9)**

**Introduction:**

The proposed project centers on the development of a network security quiz bot with a strong emphasis on data privacy. To safeguard user data, the application will be designed for local deployment, ensuring that sensitive information remains on the user's system. This approach aligns with the paramount importance of data security in network-related contexts.

The quiz bot will provide users with an interactive learning experience through two distinct types of questions. Firstly, randomly generated questions will challenge users with a variety of topics within network security. Second, specific topic-based questions will draw from a comprehensive network security database, guaranteeing the relevance and accuracy of the inquiries. These questions will encompass a spectrum of formats, including true/false statements, multiple-choice queries, and open-ended questions, fostering a well-rounded learning experience.

Furthermore, the quiz bot will offer users the opportunity to provide feedback on the quiz questions, thus contributing to its ongoing improvement. This iterative process of feedback and refinement ensures the quiz's effectiveness and educational value. In summary, the project's core objectives are rooted in network security education, data privacy, and an engaging, user-centric design.

**Project Objectives:**

* Develop a quiz bot for network security.
* Ensure data privacy by keeping the bot on a local system.
* Offer two types of questions: randomly generated and specific topic based.
* Source answers from a network security database.
* Train the bot using network security quizzes, lecture slides, textbooks, and online resources.
* Include multiple-choice questions, true/false questions, and open-ended questions.
* Implement a feedback mechanism for user answers.

**Methodology:**

To achieve the project objectives, we will follow these steps:

* **Bot Framework Selection**: We have selected GPT4All Falcon as the bot framework for local deployment, as we would want to take advantage of its advanced natural language processing capabilities. Its advanced natural language processing features will be pivotal in delivering an interactive and informative learning experience for our users.
* **Data Collection**: For Data Collection we gathered Network Security (CS-5342) lecture slides, quizzes textbooks, and online resources.
* **Bot Development:** Designing the quiz bot, incorporating question generation, user interaction, and answer evaluation components.
  + User Interaction: Implement a user interface or chat interface that allows users to engage with the bot.
  + Create / use an Embedding model: The embeddings can be used to find documents that are related to the user’s prompt. The Sentence Transformers library contains a rich variety of pre-trained embedding models.
  + Create or use a vector database to store and retrieve the embeddings. Vector Database that we plan on using is Faiss; but there are more open-source vector DB that we can explore.
  + Question Generation: Develop algorithms for generating random questions or selecting specific topic-based questions.
  + Answer Evaluation: Create a mechanism to evaluate user-provided answers and provide feedback.
* **Training:** Train the bot using the collected data to ensure accurate responses. The training will be done using one or more of the following: network security quizzes, lecture slides, network security textbook, and the Internet.
* **Question Types:** Implement the random question generation and specific topic-based question selection. The Questions must also include multiple-choice questions, true/false questions, and open-ended questions.
* **Feedback Mechanism**: Develop a feedback system to evaluate and provide feedback on user answers. Ensure the feedback system is tailored to each question type (multiple-choice, true/false, open-ended) and promotes learning and understanding.
* **Testing and Evaluation**: Conduct rigorous testing to ensure the bot functions as intended, including data privacy.
* **Data security and privacy:** The quiz questions and answers should remain on your local computer. Avoid sending or storing private information online.

**Expected Outcomes:** Upon successful completion of the project, we expect the following outcomes:

A functional network security quiz bot running locally.

**Two question types:** randomly generated and specific topic-based questions.

* Accurate answers sourced from a network security database.
* Inclusion of multiple-choice, true/false, and open-ended questions, in the form of randomly generated questions and specific topic questions sourced from network security database.
* A feedback system that evaluates and provides feedback on user answers.

**Timeline**: We plan to complete the project in about 20-25 days.

**Conclusion:** This proposal outlines the development of a network security quiz bot with a focus on data privacy, two question types, and a feedback mechanism. By following the stated methodology, we aim to achieve the project objectives and deliver a valuable tool for network security education.

**CONTRIBUTION OF GROUP MEMBERS**

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| **NAMES** | **CONTRIBUTION** |
| **Nikhil Reddy Kotha(R11902628)** | **Implement question generation, and answer evaluation components** |
| **Koushik Reddy Allam (R11909206)** | **Collect data and organize it in a structured format for training and integration into the bot** |
| **Rohith Kumar Mattam(R11906209)** | **Handle bot training and fine-tuning** |
| **Sohail Mohammed (R11847454)** | **Design and develop UI** |
| **Steve Mwika (R11653288)** | **Integrate the selected bot into the project** |
| **Lokesh Kumar Veshala(R11852061)** | **Conduct rigorous testing and develop feedback mechanism** |

**GitHub Repository Link: https://github.com/Rohithkumar850/Quiz\_bot**