Hajee Mohammad Danesh Science and Technology University,
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Project Name: Custom Chat Application

Department: Computer Science & Engineering

Course code: CSE 416

Course Title : Mobile and Wireless Communication Sessional

Level: 4, Semester : 1

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CERTIFICATE

This is to certify that the work is entitled as “Custom Chat Application” by Md. Abu Bakar, Md. Abdullah Al Mamun, Md. Farhan Ahmed Emon, Md Firoz Islam and Riduwoanul have been carried out under our supervision. To the best of our knowledge this work is an original one and was not submitted anywhere for a diploma or a degree.

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ABSTRACT

This project presents a real-time chat application developed using Flask, Socket.IO, and Python, facilitating instant communication between users within dynamically created chat rooms. The main objectives include providing a seamless and interactive chat experience, supporting multimedia file sharing, and maintaining message persistence. Utilizing Flask for server-side scripting, Socket.IO for real-time communication, and a SQLite database for message storage, the application offers a user-friendly interface for creating or joining chat rooms. While the project successfully achieves its core objectives, limitations include scalability concerns, browser compatibility issues, and a lack of moderation features. Future work involves enhancing scalability, addressing compatibility challenges, implementing multimedia support, and bolstering security measures. The project underscores the dynamic nature of web development and the continuous pursuit of optimizing user experiences in real-time communication platforms.

TABLE OF CONTENTS

1 Introduction

1.1 Introduction:

In today's digital era, real-time communication platforms play a pivotal role in connecting individuals seamlessly. This project introduces a real-time chat application developed using Flask, Socket.IO, Python, HTML, and CSS. The application empowers users to engage in instantaneous conversations by creating or joining chat rooms. Leveraging web technologies, the project emphasizes the importance of interactive and dynamic communication interfaces in enhancing user connectivity.

1.2 Project Objective and Aim:

The primary objective of this project is to develop a robust and user-friendly real-time chat application that facilitates instant communication among users. The aim is to create an interactive platform where individuals can engage in dynamic conversations, share multimedia content, and experience a fluid and responsive interface. Key goals include implementing real-time messaging functionality, supporting multimedia file sharing, and ensuring message persistence for an enriched user experience.

1.3 Needs of this System:

The system addresses the contemporary need for efficient and real-time communication tools. In a world where connectivity is paramount, this project caters to the growing demand for platforms that enable instant interactions and information sharing. The system caters to users seeking a seamless and responsive chat experience, where they can create or join chat rooms effortlessly. Additionally, the project recognizes the need for multimedia support, acknowledging the diverse ways in which users share information and engage in digital conversations.

2 Literature Review

2.1 Related Work:

Various studies and projects in the literature have explored the development of real-time chat applications, highlighting the significance of frameworks like Flask and Socket.IO. Past endeavors have focused on enhancing user experiences, scalability, and security in similar applications. The review also considers the role of multimedia support in contemporary chat platforms and explores different approaches to message persistence. Comparisons with existing systems provide insights into the strengths and weaknesses of various technological choices, informing the design decisions made in the current project.

2.2 Conclusion:

The literature review synthesizes key findings from existing research and projects, laying the groundwork for the development of the current real-time chat application. By identifying trends, challenges, and successful implementations, this section contributes to a comprehensive understanding of the state of the art in web-based communication platforms. The insights gained from the literature review guide the project in adopting proven strategies and innovative solutions to meet the objectives outlined in the introduction.

3 System Analysis

3.1 Software Requirements:

The software requirements encompass the essential tools and frameworks needed for the successful development and deployment of the real-time chat application. This includes server-side scripting with Flask, real-time communication integration with Socket.IO, front-end development using HTML and CSS, and database management using SQLite.

3.2 Hardware Requirements:

Hardware requirements outline the infrastructure necessary to support the application. Given the lightweight nature of the Flask and Socket.IO framework, the hardware prerequisites are minimal, ensuring the application's compatibility with a broad range of computing devices.

3.3 The Technologies We Used:

This section details the core technologies employed in the project, emphasizing Flask and Socket.IO for server-client communication, Python for server-side scripting, HTML and CSS for the user interface, and SQLite for message persistence in the database.

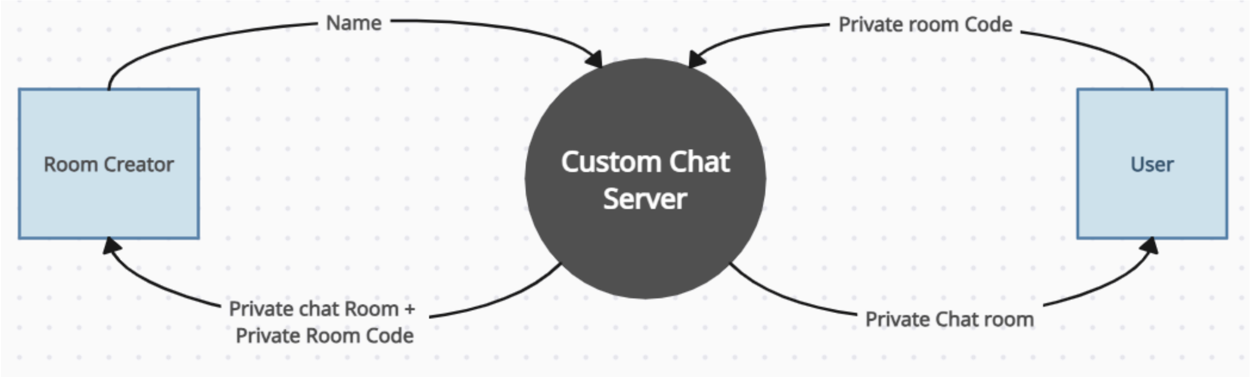
3.4 Purpose:

The purpose of the real-time chat application is to provide users with a seamless and responsive platform for instant communication. By leveraging web technologies, the application aims to foster dynamic conversations, support multimedia file sharing, and ensure message persistence, thereby enhancing the overall user experience.

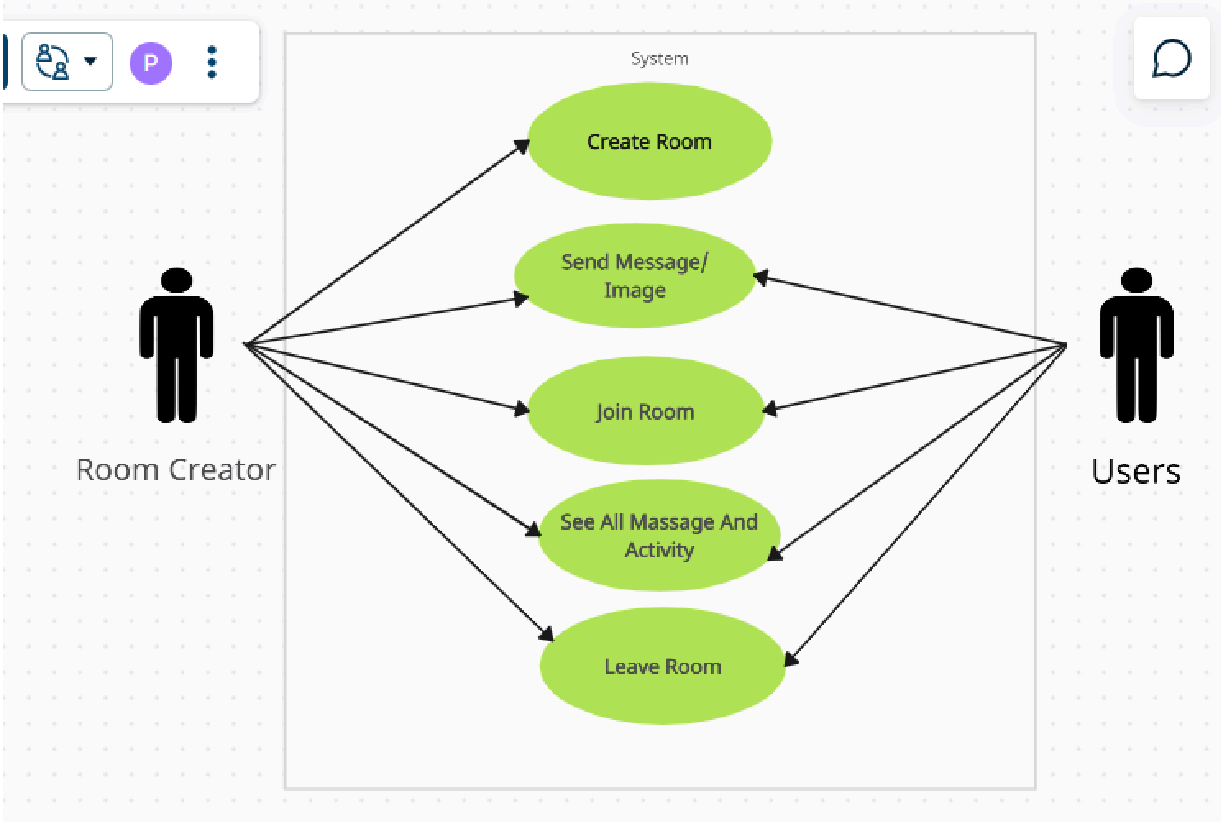
3.5 Project Scope:

The project scope delineates the boundaries and features of the real-time chat application. It outlines the functionalities that will be implemented, emphasizing real-time messaging, multimedia support, and message persistence. The scope also considers the scalability and extensibility of the application to accommodate future enhancements and updates.

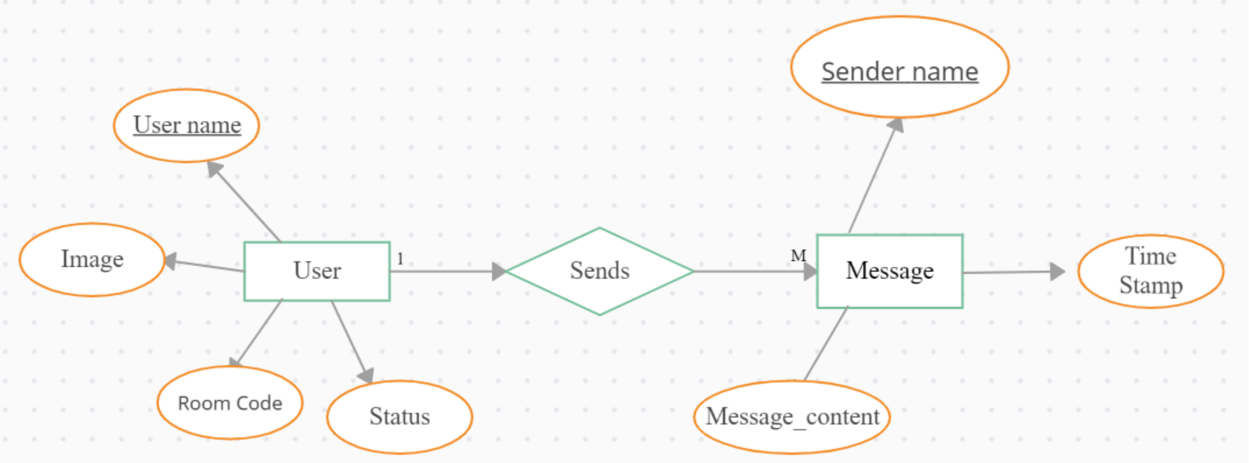
3.6 Data Flow Diagram



3.7 Use Case Diagram



3.8 E-R diagram for this project



4 System Design and Development

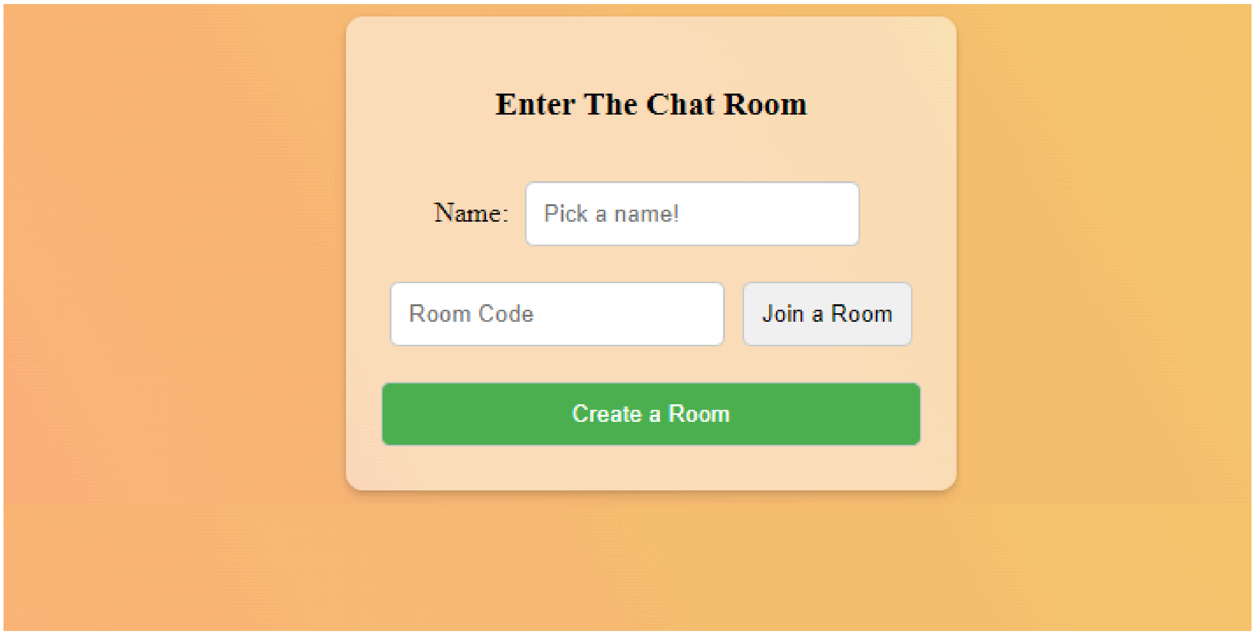
4.1 Modules Description

Home Module: Responsible for user registration, room creation, and joining.

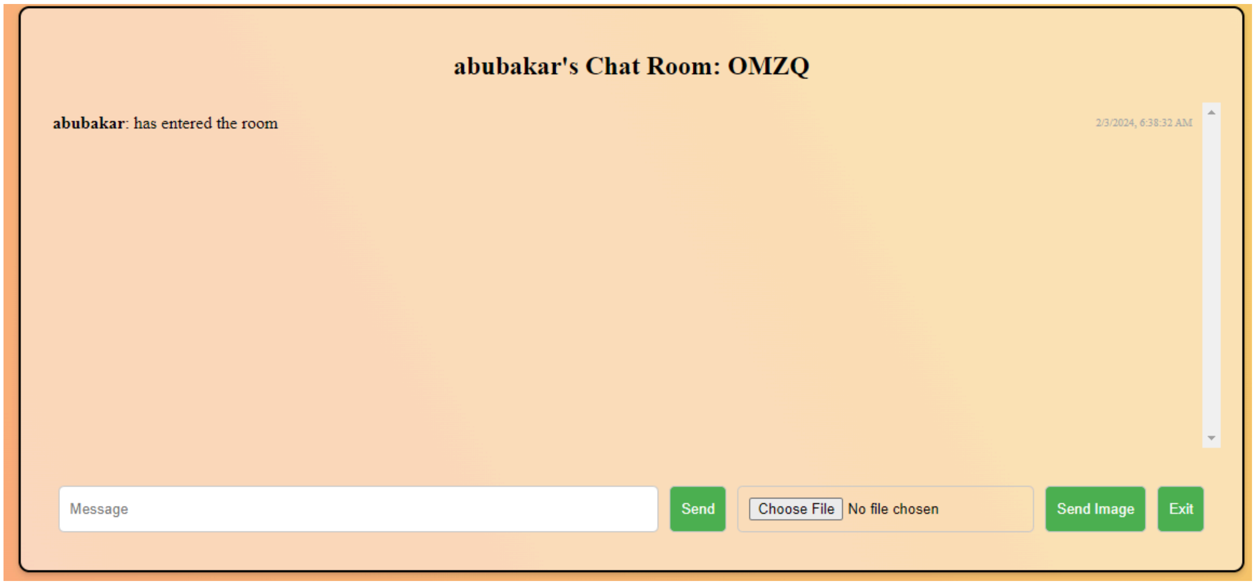
Room Module: Manages the chat room interface, messaging, and user interactions.

5 Result and Discussion

Home page to Create or Join Chat.

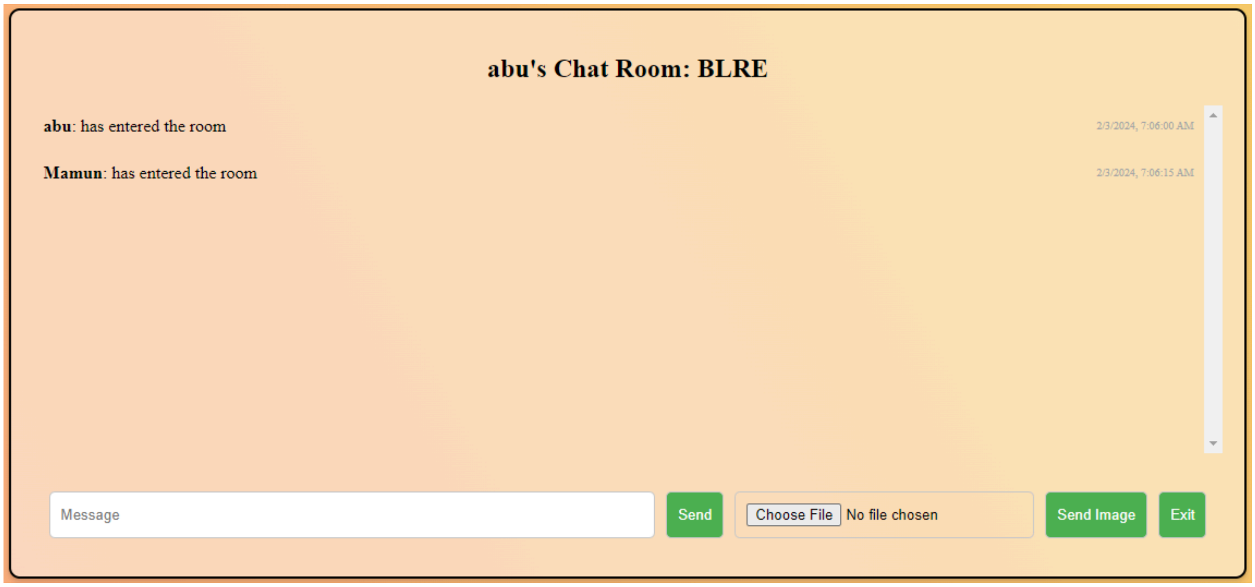


Created Chat Room


abubakar's Chat Room: OMZQ

abubakar: has entered the room 2/3/2024, 6:38:32 AM

Join Chat Room

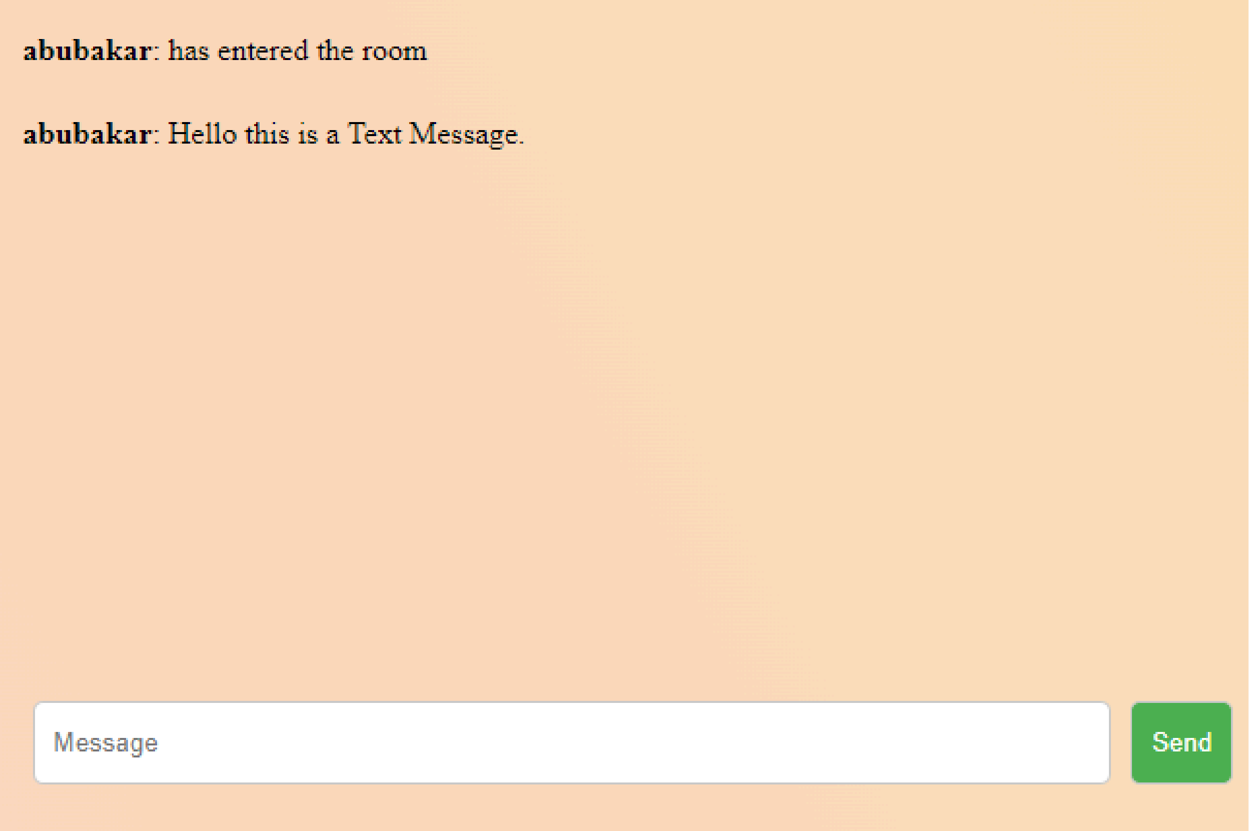


abu's Chat Room: BLRE

abu: has entered the room 2/3/2024, 7:06:00 AM

Mamun: has entered the room 2/3/2024, 7:06:15 AM

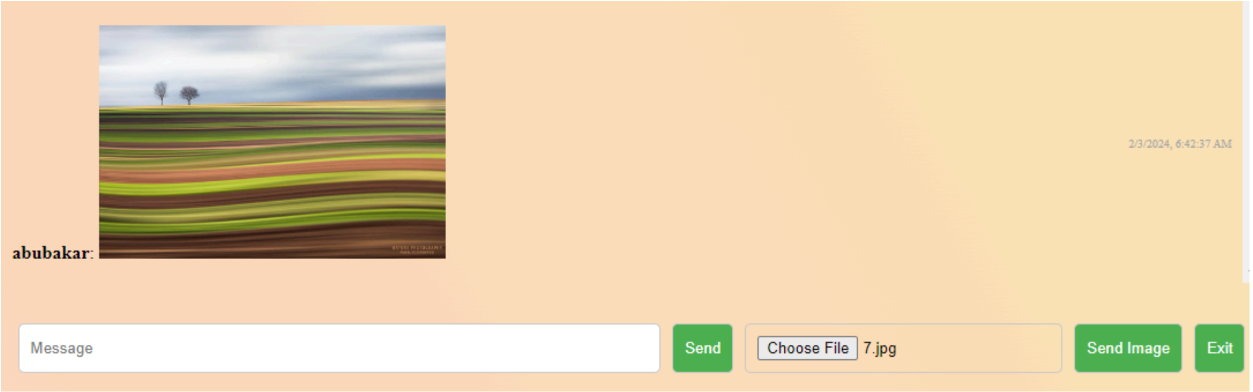
Send Text Message



abubakar: has entered the room

abubakar: Hello this is a Text Message.

Send Images



abubakar:

2/3/2024, 6:42:37 AM

7.jpg

6 Conclusion

6.1 Limitation

- No User Status Indicators
- No Message Editing or Deletion
- Less functions are used
- Not a complete messaging system

6.2 Future work

- User Authentication: Implement user authentication to secure chat rooms.
- Private Messaging: Introduce private messaging features between users.
- Notifications: Implement real-time notifications for new messages and room activities.

6.3 Conclusion

The Custom chat application successfully provides a real-time communication platform with room creation, text, and image messaging features. While achieving its main objectives, future work can enhance security, user experience, and introduce additional features to make it even more versatile and user-friendly.

References

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https://socket.io/docs/v4/

https://docs.python.org/3/tutorial/index.html