TEXAS TECH UNIVERSITY

CS-5342 - Network Security

OnDemand Teacher Q&A Bot

Team Number: - 4

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ABSTRACT:

- *The "OnDemand Professor Q&A Bot"* is a software application with a conversational interface that enables users to communicate with it in the same way they would with a human. A piece of software sophisticated enough to resemble human interactions is known as a virtual chatbot. Virtually all customer interactions involve conversational bots, such as when a client is messaged immediately. Since the creation of the first chatbot, their functionality and user interface have advanced, and their importance to the technical community cannot be understated. But even now, modelling interactions in this area is still quite difficult. Conversational agents are now utilized in numerous applications, despite the fact that they are far from flawless.

Introduction:

- In an era of rapid technological advancements, the Q&A Bot emerges as a versatile and intelligent solution designed to streamline the process of information retrieval and problem-solving.
- This innovative bot is equipped with the capability to respond to user queries, offering a dynamic and efficient approach to addressing a wide array of questions across diverse domains.
- The Q&A Bot finds applications in various fields, including education, customer support, and general information retrieval. Its versatility makes it a valuable asset for individuals and organizations seeking quick and reliable answers to their questions.

Components:

BERT ALGORITHM Which is the one of the top LLM model

Benefits:

- With its diverse approach, the "OnDemand Professor Q&A Bot" project aims to improve students' network security education. Users can ask questions at their own pace and receive prompt, correct responses from the Q&A Bot, which enhances their grasp of the course material. The Q&A Bot is dynamic and interactive. One of the project's most important goals is to prioritize data privacy, which is accomplished by storing the Q&A Bot and its related data only locally. Users will feel more comfortable interacting with the bot because of this measure's significant reduction in the likelihood of sensitive network security information being compromised.

Prototype Submission / Simulation Setup:

1. Software setup:

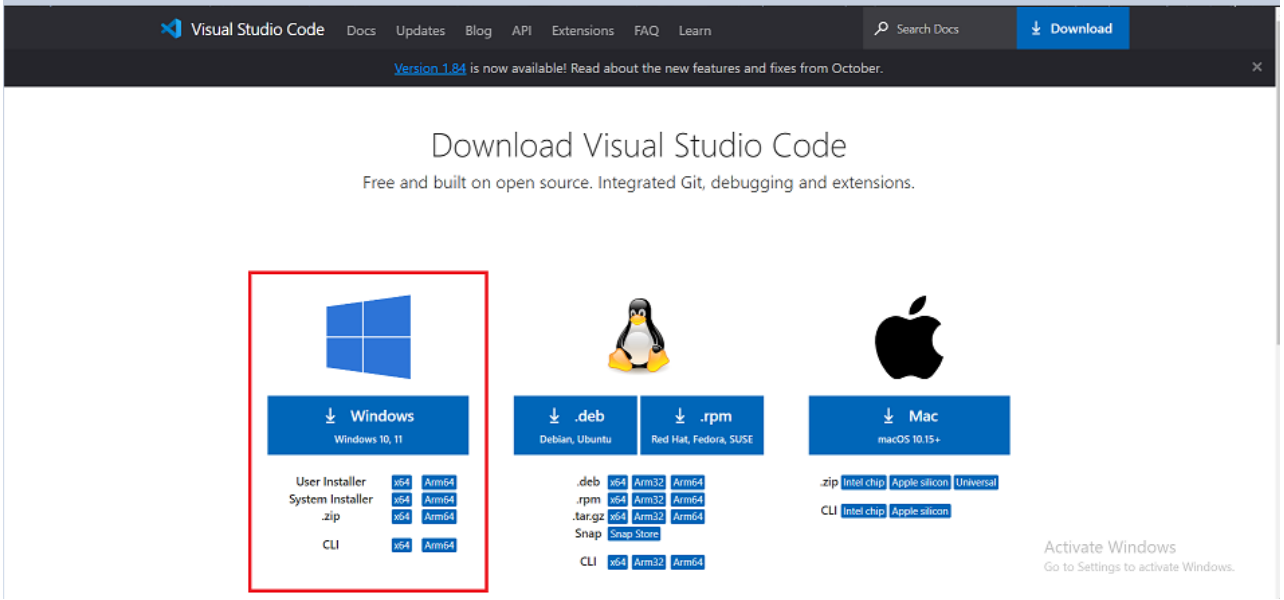
The software setup for this project are :

- Visual Studio Code
- Python 3.11
- Anaconda

Visual Studio Code

A code editor with many features, Visual Studio Code is adaptable to a wide range of developers and programming languages. Because of its tremendous capabilities, extensibility, and user-friendly interface, the developer community has adopted it widely.

https://code.visualstudio.com/download

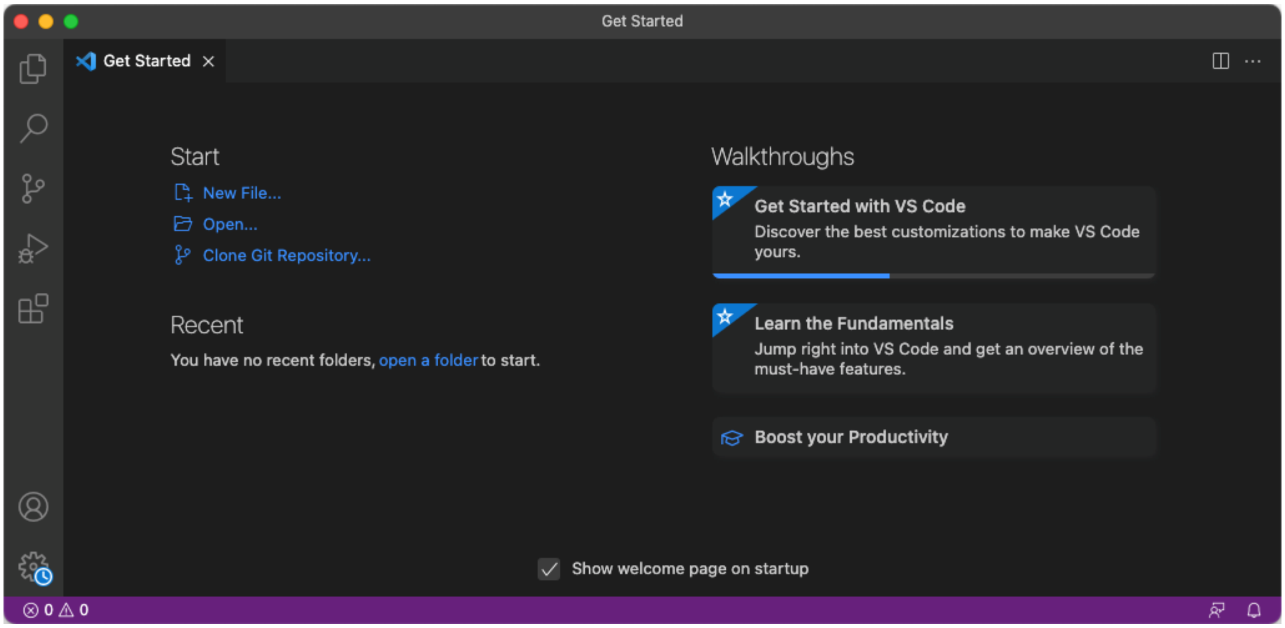


Version 1.84 is now available! Read about the new features and fixes from October.

Download Visual Studio Code

Free and built on open source. Integrated Git, debugging and extensions.

Activate Windows
Go to Settings to activate Windows.



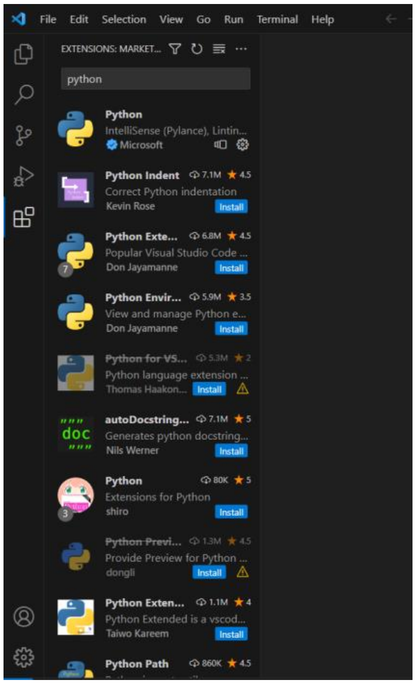
You have no recent folders, open a folder to start.

Get Started with VS Code
Discover the best customizations to make VS Code yours.

Learn the Fundamentals
Jump right into VS Code and get an overview of the must-have features.

☑ Show welcome page on startup

Install the Python extension in Visual Studio Code for Python language implementation.



Python
IntelliSense (Pylance), Lintin...
Microsoft

Python Indent 7.1M ★ 4.5
Correct Python indentation
Kevin Rose Install

Python Exte... 6.8M ★ 4.5
Popular Visual Studio Code ...
Don Jayamanne Install

Python Envir... 5.9M ★ 3.5
View and manage Python e...
Don Jayamanne Install

~~Python for VS...~~ 5.3M ★ 2
Python language extension ...
Thomas Haakon... Install ⚠

autoDocstring... 7.1M ★ 5
Generates python docstring...
Nils Werner Install

Python 80K ★ 5
Extensions for Python
shiro Install

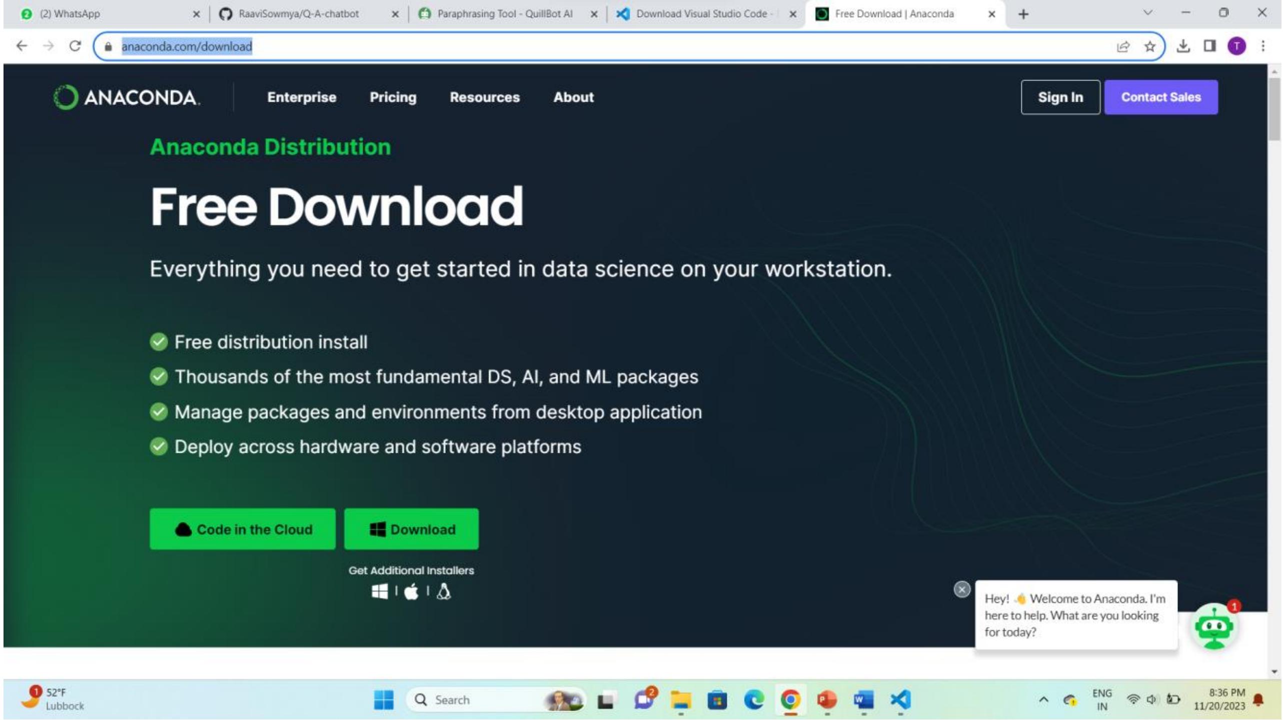
~~Python Previ...~~ 1.3M ★ 4.5
Provide Preview for Python ...
dongli Install ⚠

Python Exten... 1.1M ★ 4
Python Extended is a vscod...
Taiwo Kareem Install

Python Path 860K ★ 4.5

Anaconda:

https://www.anaconda.com/download



Anaconda Distribution

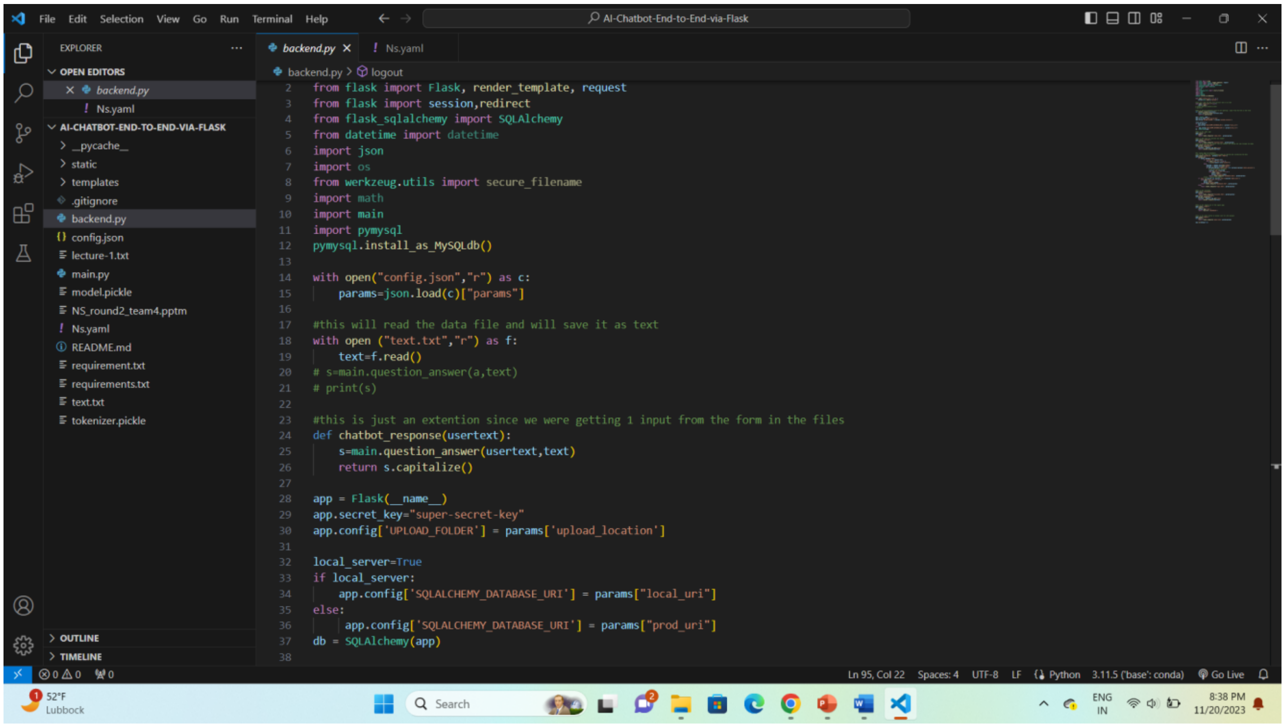
Free Download

Everything you need to get started in data science on your workstation.

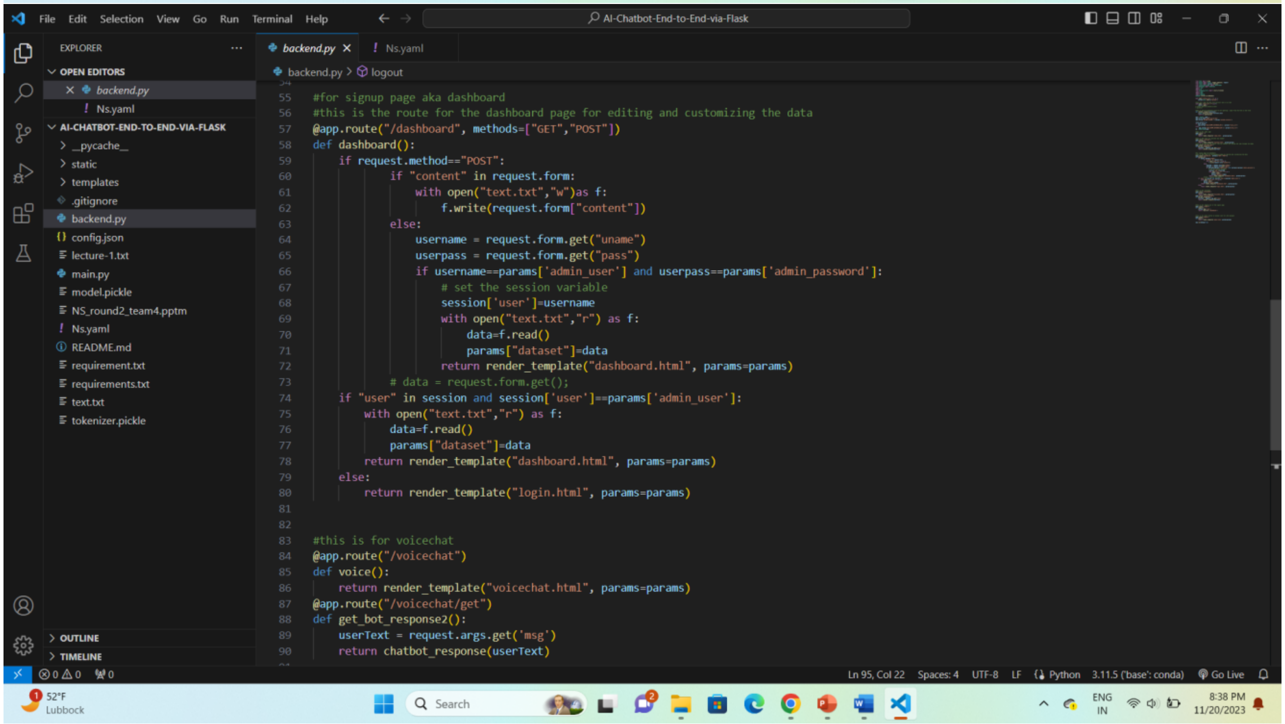
- ✓ Free distribution install
- ✓ Thousands of the most fundamental DS, AI, and ML packages
- ✓ Manage packages and environments from desktop application
- ✓ Deploy across hardware and software platforms

Hey! 👋 Welcome to Anaconda. I'm here to help. What are you looking for today?

Source Code:



```python
from flask import Flask, render_template, request
from flask import session,redirect
from flask_sqlalchemy import SQLAlchemy
from datetime import datetime
import json
import os
from werkzeug.utils import secure_filename
import math
import main
import pymysql
pymysql.install_as_MySQLdb()

with open("config.json","r") as c:
    params=json.load(c)["params"]

#this will read the data file and will save it as text
with open ("text.txt","r") as f:
    text=f.read()
# s=main.question_answer(a,text)
# print(s)

#this is just an extention since we were getting 1 input from the form in the files
def chatbot_response(usertext):
    s=main.question_answer(usertext,text)
    return s.capitalize()

app = Flask(__name__)
app.secret_key="super-secret-key"
app.config['UPLOAD_FOLDER'] = params['upload_location']

local_server=True
if local_server:
    app.config['SQLALCHEMY_DATABASE_URI'] = params["local_uri"]
else:
     app.config['SQLALCHEMY_DATABASE_URI'] = params["prod_uri"]
db = SQLAlchemy(app)
```

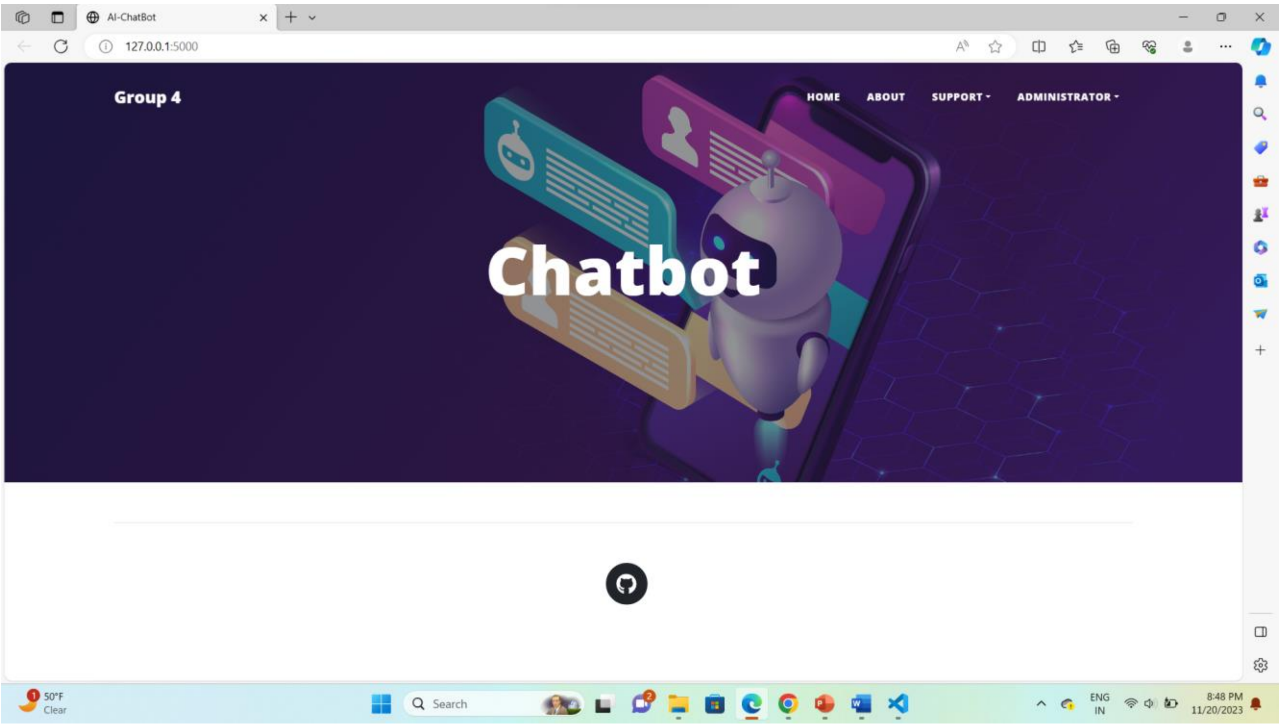


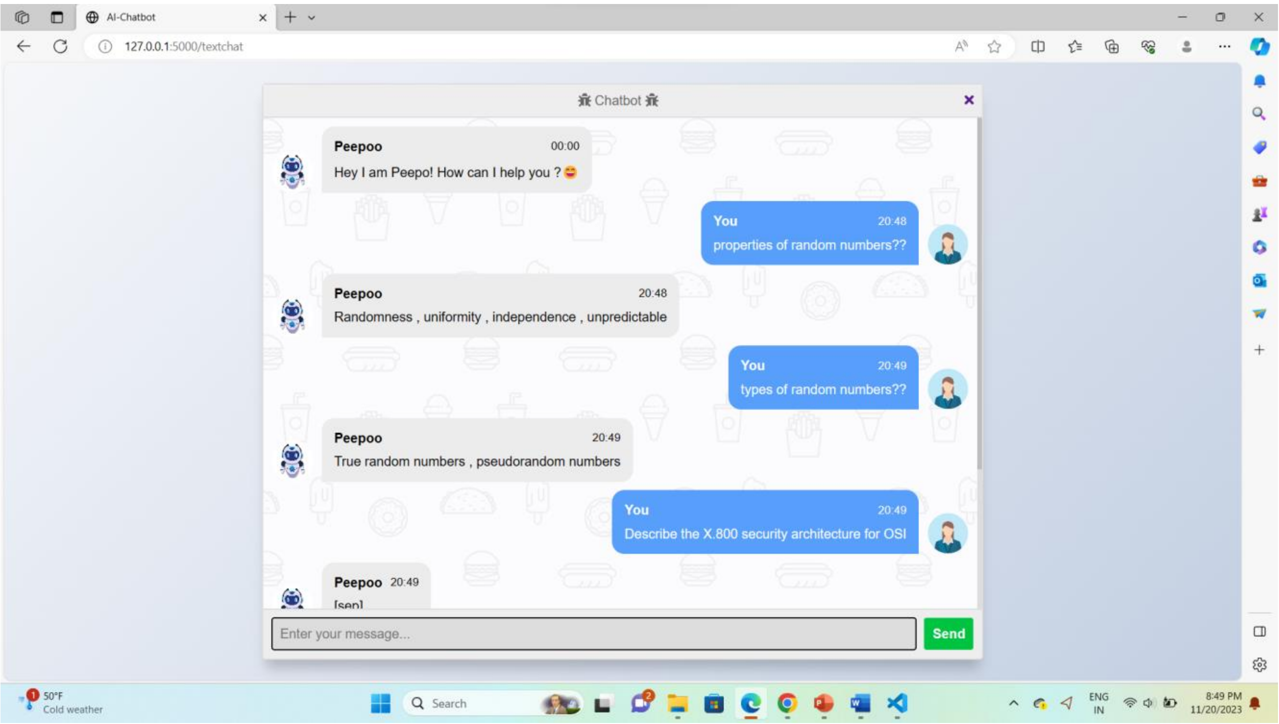
```python
#for signup page aka dashboard
#this is the route for the dashboard page for editing and customizing the data
@app.route("/dashboard", methods=["GET","POST"])
def dashboard():
    if request.method=="POST":
            if "content" in request.form:
                with open("text.txt","w")as f:
                    f.write(request.form["content"])
            else:
                username = request.form.get("uname")
                userpass = request.form.get("pass")
                if username==params['admin_user'] and userpass==params['admin_password']:
                    # set the session variable
                    session['user']=username
                    with open("text.txt","r") as f:
                        data=f.read()
                        params["dataset"]=data
                    return render_template("dashboard.html", params=params)
            # data = request.form.get();
    if "user" in session and session['user']==params['admin_user']:
        with open("text.txt","r") as f:
            data=f.read()
            params["dataset"]=data
        return render_template("dashboard.html", params=params)
    else:
        return render_template("login.html", params=params)


#this is for voicechat
@app.route("/voicechat")
def voice():
    return render_template("voicechat.html", params=params)
@app.route("/voicechat/get")
def get_bot_response2():
    userText = request.args.get('msg')
    return chatbot_response(userText)
```

Libraries / Dependencies /Python Packages – Versions :

- PyTorch
- Pickle
- Bootstrap is used for frontend development
- certifi
- charset-normalizer==3.1.0
- click==8.1.3
- colorama==0.4.6
- filelock==3.11.0
- Flask==2.2.3
- Flask-SQLAlchemy==3.0.3
- greenlet==2.0.2
- huggingface-hub==0.13.4
- idna==3.4
- importlib-metadata==6.2.0
- itsdangerous==2.1.2
- Jinja2==3.1.2
- MarkupSafe==2.1.2
- mpmath==1.3.0
- mysqlclient==2.1.1
- networkx==3.1
- numpy==1.24.2
- packaging==23.0
- PyMySQL==1.0.3
- PyYAML==6.0
- regex==2023.3.23
- requests==2.28.2
- SQLAlchemy==2.0.9
- sympy==1.11.1
- tokenizers==0.13.3
- torch==2.0.0
- tqdm==4.65.0
- transformers==4.27.4
- typing_extensions==4.5.0
- urllib3==1.26.15
- Werkzeug==2.2.3
- wincertstore==0.2
- zipp==3.15.0

Chatbot Outputs:





Peepoo 00:00
Hey I am Peepo! How can I help you ?😊

You 20:48
properties of random numbers??

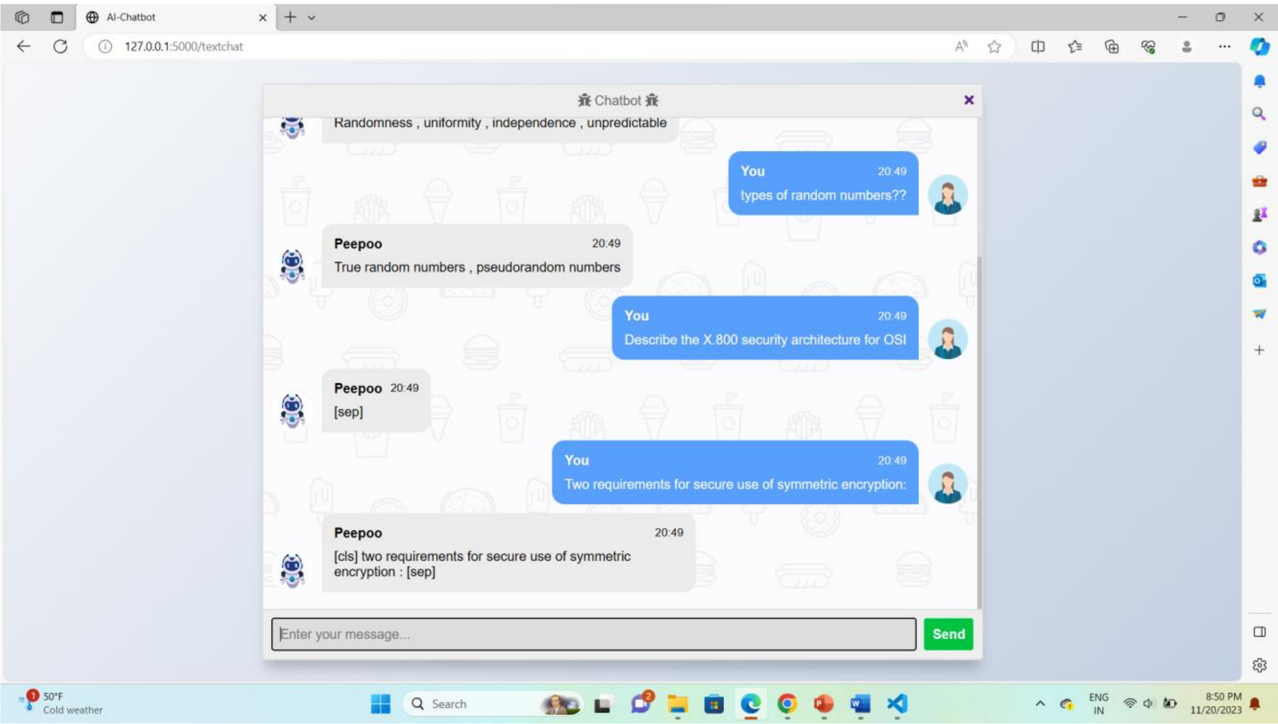
Peepoo 20:48
Randomness , uniformity , independence , unpredictable

You 20:49
types of random numbers??

Peepoo 20:49
True random numbers , pseudorandom numbers

You 20:49
Describe the X.800 security architecture for OSI

Peepoo 20:49
[sep]



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Peepoo 20:49
[sep]

You 20:49
Two requirements for secure use of symmetric encryption:

Peepoo 20:49
[cls] two requirements for secure use of symmetric encryption : [sep]

Team Contribution:

Sowmya Raavi	• Framing the questions and evaluating the answer components, ensuring that the responses are accurate.
Sasi kiran Boyapati	• UI design and development.
Thanmayee Kandula	• Writing algorithms based on queries and content and implementing NLP techniques to understand queries.
Sarath Chandra sharma kasibotla	• Testing and training rigorously and taking the feedback.
Naga Vidya Kolli	• Finding the algorithms which provides accurate results.
Jahnavi Gurrala	• Gathering the data and storing it in the database,running the project on loacal machines.

Conclusion:

- The main objective of Q&A chatbot is to respond to user questions with accurate and pertinent information.
- The chatbot will be able to comprehend the user's query, offer detailed responses, and engage the user in easy-to-use activities.
- The chatbot should have a thorough understanding of the context in which the information or data for which it is intended will be used.
- The bot is well trained to identify and respond to any errors submitted by the user.

Future Work:

- The future of the project may be focused on continuously improving Q&A Bot functionality by means of machine learning techniques, with a view to enhancing its understanding of Natural Language and addressing user's input using appropriate responses. In addition, there is the possibility to add a voice feature.