Experiment 2: Introduction to Streamlit for Machine Learning Applications

Aim:

To understand the basics of Streamlit and demonstrate how to create a simple machine learning web application using Streamlit.

Apparatus Required:

- Python (Anaconda/Miniconda/Standard Python Installation)
- Streamlit Library
- Code Editor (e.g., VSCode, Jupyter Notebook, or PyCharm)
- Web browser

Theory:

Streamlit is an open-source Python library that allows the creation of custom web applications for machine learning and data science. It is used to quickly build interactive user interfaces directly from Python scripts. Streamlit automatically detects changes in code and updates the web app in real time. It supports input widgets, charting libraries, and seamless integration with ML models.

Key Features:

- Simple syntax with no need for front-end programming
- Real-time UI updates
- Integration with popular ML libraries (TensorFlow, Scikit-learn, etc.)

Code:

!pip install streamlit

```
streamlit_code = '''
import streamlit as st
st.title("Streamlit App from Jupyter")
st.write("This is a Streamlit app created from within Jupyter Notebook.")
name = st.text_input("Enter your name:")
if name:
    st.success(f"Welcome, {name}!")
'''
with open("app_from_jupyter.py", "w") as f:
    f.write(streamlit_code)
print("✅ Streamlit file created: app_from_jupyter.py")
```

```
streamlit_code = '''
import streamlit as st
st.set_page_config(page_title="BMI Calculator", layout="centered")
st.title("🧮 BMI Calculator")
st.write("Calculate your Body Mass Index (BMI) based on your height and weight.")

# Input fields
weight = st.number_input("Enter your weight (kg)", min_value=1.0,
max_value=200.0, value=70.0)
height = st.number_input("Enter your height (cm)", min_value=50.0,
max_value=250.0, value=170.0)
if st.button("Calculate BMI"):
    height_m = height / 100
    bmi = weight / (height_m ** 2)
    st.success(f"Your BMI is: {bmi:.2f}")
    if bmi < 18.5:
        st.warning("You are underweight.")
    elif 18.5 <= bmi < 24.9:
        st.info("You have a normal weight.")
    elif 25 <= bmi < 29.9:
        st.warning("You are overweight.")
    else:
        st.error("You are obese.")
'''
with open("bmi_calculator.py", "w", encoding="utf-8") as f:
    f.write(streamlit_code)
print("✅ Streamlit BMI Calculator created: bmi_calculator.py")
```

How to Run:

Open a terminal or command prompt and run the following command:

streamlit run app.py

This command launches the Streamlit web app on the default browser.

Result:

When the above code is run using Streamlit, a web page is launched in the browser with a title, a text display, and an interactive text input box that responds to user input.