1. Upload the Dataset

```
from google.colab import files
uploaded = files.upload()
```

Choose Files Fake.csv

- **Fake.csv**(text/csv) - 62789876 bytes, last modified: 4/24/2025 - 100% done

```
Saving Fake.csv to Fake.csv
```

2. Load the Dataset

```
import pandas as pd

df = pd.read_csv("Fake.csv")  # Replace with your uploaded filename
df.head()
```

3. Data Exploration

```
print("Dataset Info:")
print(df.info())

print("\nDataset Description:")
print(df.describe(include='all'))

print("\nMissing Values:")
print(df.isnull().sum())

print("\nDuplicate Rows:")
print(df.duplicated().sum())
```

```
Dataset Info:
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 23481 entries, 0 to 23480
Data columns (total 4 columns):
 #   Column   Non-Null Count  Dtype 
---  ------   --------------  ----- 
 0   title    23481 non-null  object
 1   text     23481 non-null  object
 2   subject  23481 non-null  object
 3   date     23481 non-null  object
dtypes: object(4)
memory usage: 733.9+ KB
None

Dataset Description:
                                                    title   text subject  \
count                                               23481  23481   23481   
unique                                              17903  17455       6   
top     MEDIA IGNORES Time That Bill Clinton FIRED His...           News   
freq                                                    6    626    9050   

                date  
count          23481  
unique          1681  
top     May 10, 2017  
freq              46  

Missing Values:
title      0
text       0
subject    0
date       0
dtype: int64

Duplicate Rows:
3
```

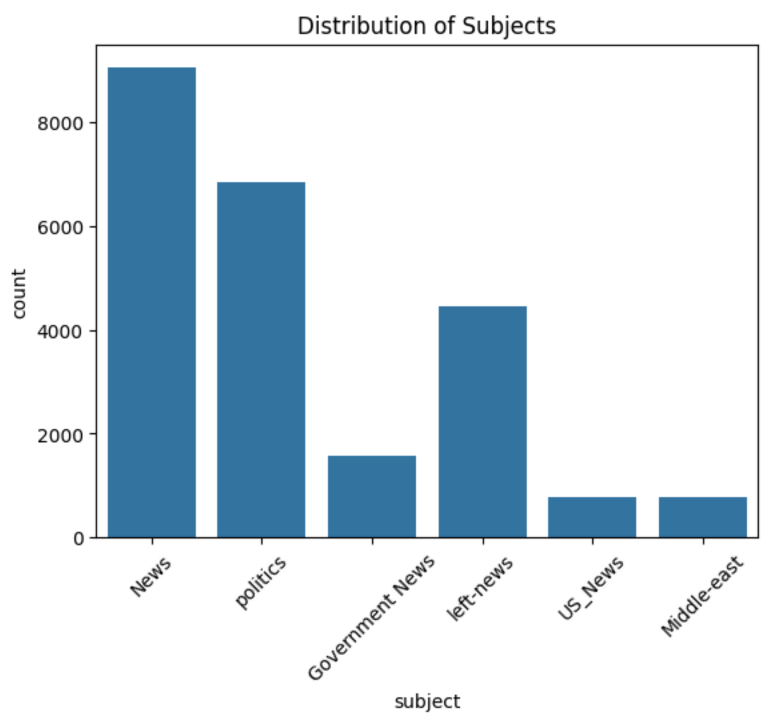
4. Check for Missing Values and Duplicates

```
# Drop duplicates
df = df.drop_duplicates()

# Check again
df.isnull().sum(), df.duplicated().sum()
```

```
(title      0
 text       0
 subject    0
 date       0
 dtype: int64,
 np.int64(0))
```

5. Visualize a Few Features

```
import seaborn as sns
import matplotlib.pyplot as plt

# Plot count of subjects
sns.countplot(x='subject', data=df)
plt.xticks(rotation=45)
plt.title("Distribution of Subjects")
plt.show()
```



6. Identify Target and Features

```
# We'll use 'text' as feature and create a fake news label (1 = Fake)
df['label'] = 1  # Since this dataset contains only fake news, label all as 1
X = df['text']
y = df['label']
```

7. Convert Categorical Columns to Numerical

```
# Not required at this point because 'text' is the only feature, and it's already textual.
# However, if needed later, we can convert 'subject' using label encoding.
from sklearn.preprocessing import LabelEncoder

le = LabelEncoder()
df['subject_encoded'] = le.fit_transform(df['subject'])
```

8. One-Hot Encoding

```
# Again, not necessary here since we aren't using 'subject' directly.
# If you were using categorical features like 'subject', you'd do:
df_encoded = pd.get_dummies(df, columns=['subject'])
```

9. Feature Scaling

```
# Scaling is not applied to text features. This step is skipped unless you have numeric features.
# However, we can mention it if you later add numerical features like word counts or sentiment scores.
```

10. Train-Test Split

```
from sklearn.model_selection import train_test_split

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
```

```
from google.colab import drive
drive.mount('/content/drive')
```

11. Model Building

```
X_train = X_train.astype(str)
X_test = X_test.astype(str)
print(X_train.isnull().sum())
print(y_train.isnull().sum())

# Drop missing
X_train = X_train.dropna()
y_train = y_train[X_train.index]  # align with cleaned X_train
print("X_train shape:", X_train.shape)
print("y_train shape:", y_train.shape)
model = Pipeline([
    ('tfidf', TfidfVectorizer(stop_words='english', max_df=0.7)),
    ('clf', LogisticRegression(solver='liblinear'))
])
```

12. Evaluation

```
from sklearn.metrics import classification_report, confusion_matrix, accuracy_score

try:
    print("➡️ Checking X_test and y_test formats...")
    X_test = X_test.fillna('').astype(str)
    print("✅ Format OK.")

    print("➡️ Checking model training...")
    model.named_steps['clf'].coef_  # test if model is trained
    print("✅ Model is trained.")

    print("➡️ Checking length match...")
    print(f"X_test: {X_test.shape}, y_test: {y_test.shape}")
    if len(X_test) != len(y_test):
        raise ValueError("❌ Mismatch between X_test and y_test length.")

    print("➡️ Predicting...")
    y_pred = model.predict(X_test)
    print("✅ Prediction complete.")

    print("\n🎯 Evaluation Metrics:")
    print("Accuracy Score:", accuracy_score(y_test, y_pred))
    print("Confusion Matrix:\n", confusion_matrix(y_test, y_pred))
    print("Classification Report:\n", classification_report(y_test, y_pred))

except Exception as e:
    print("🚨 ERROR OCCURRED DURING EVALUATION:")
    print(type(e).__name__, ":", e)
```

```
➡️ Checking X_test and y_test formats...
🚨 ERROR OCCURRED DURING EVALUATION:
NameError : name 'X_test' is not defined
```

13. Make Predictions from New Input

```
# Step 13: Make Predictions from New Input
new_input = ["Breaking news: NASA discovers water on Mars!"]

# Ensure input is valid
if not isinstance(new_input, list) or not all(isinstance(i, str) for i in new_input):
    raise ValueError("Input must be a list of strings")

try:
    prediction = model.predict(new_input)
    print("Prediction:", "Fake" if prediction[0] == 1 else "Real")
except Exception as e:
    print("🚨 ERROR during prediction:", type(e).__name__, "→", e)
```

```
🚨 ERROR during prediction: NameError → name 'model' is not defined
```

14. Convert to DataFrame and Encode

```
# Step 14: Convert to DataFrame and Predict

import pandas as pd

# Sample new data
new_data = [
    "New vaccine has been approved by the government",
    "Aliens have landed in California according to reports"
]

# Convert to DataFrame
new_df = pd.DataFrame(new_data, columns=['text'])

# Clean the text column
new_df['text'] = new_df['text'].fillna('').astype(str)

# Predict using your trained model
try:
    new_df['prediction'] = model.predict(new_df['text'])
    new_df['label'] = new_df['prediction'].apply(lambda x: "Fake" if x == 1 else "Real")
    print(new_df)
except Exception as e:
    print("🚨 ERROR during batch prediction:", type(e).__name__, "→", e)
```

```
🚨 ERROR during batch prediction: NameError → name 'model' is not defined
```

15. Predict the Final Grade

```
# Step 15: Predict the confidence score ("final grade")

# Make sure you define new_input correctly
new_input = ["Breaking news: NASA discovers water on Mars!"]

# Ensure model and input are ready
try:
    prob = model.predict_proba(new_input)
    print("Confidence Score (Fake):", prob[0][1])  # Probability that it's fake (label=1)
except Exception as e:
    print("🚨 ERROR during confidence prediction:", type(e).__name__, "→", e)
```

```
🚨 ERROR during confidence prediction: NameError → name 'model' is not defined
```

16. Deployment – Building an Interactive App

```
!pip install gradio
import gradio as gr
```

```
Collecting gradio
  Downloading gradio-5.29.0-py3-none-any.whl.metadata (16 kB)
Collecting aiofiles<25.0,>=22.0 (from gradio)
  Downloading aiofiles-24.1.0-py3-none-any.whl.metadata (10 kB)
Requirement already satisfied: anyio<5.0,>=3.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (4.9.0)
Collecting fastapi<1.0,>=0.115.2 (from gradio)
  Downloading fastapi-0.115.12-py3-none-any.whl.metadata (27 kB)
Collecting ffmpy (from gradio)
  Downloading ffmpy-0.5.0-py3-none-any.whl.metadata (3.0 kB)
Collecting gradio-client==1.10.0 (from gradio)
  Downloading gradio_client-1.10.0-py3-none-any.whl.metadata (7.1 kB)
Collecting groovy~=0.1 (from gradio)
  Downloading groovy-0.1.2-py3-none-any.whl.metadata (6.1 kB)
Requirement already satisfied: httpx>=0.24.1 in /usr/local/lib/python3.11/dist-packages (from gradio) (0.28.1)
Requirement already satisfied: huggingface-hub>=0.28.1 in /usr/local/lib/python3.11/dist-packages (from gradio) (0.30.2)
Requirement already satisfied: jinja2<4.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (3.1.6)
Requirement already satisfied: markupsafe<4.0,>=2.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (3.0.2)
Requirement already satisfied: numpy<3.0,>=1.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (2.0.2)
Requirement already satisfied: orjson~=3.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (3.10.18)
Requirement already satisfied: packaging in /usr/local/lib/python3.11/dist-packages (from gradio) (24.2)
Requirement already satisfied: pandas<3.0,>=1.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (2.2.2)
Requirement already satisfied: pillow<12.0,>=8.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (11.2.1)
Requirement already satisfied: pydantic<2.12,>=2.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (2.11.4)
Collecting pydub (from gradio)
  Downloading pydub-0.25.1-py2.py3-none-any.whl.metadata (1.4 kB)
Collecting python-multipart>=0.0.18 (from gradio)
```

```
    Downloading python_multipart-0.0.20-py3-none-any.whl.metadata (1.8 kB)
  Requirement already satisfied: pyyaml<7.0,>=5.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (6.0.2)
  Collecting ruff>=0.9.3 (from gradio)
    Downloading ruff-0.11.8-py3-none-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (25 kB)
  Collecting safehttpx<0.2.0,>=0.1.6 (from gradio)
    Downloading safehttpx-0.1.6-py3-none-any.whl.metadata (4.2 kB)
  Collecting semantic-version~=2.0 (from gradio)
    Downloading semantic_version-2.10.0-py2.py3-none-any.whl.metadata (9.7 kB)
  Collecting starlette<1.0,>=0.40.0 (from gradio)
    Downloading starlette-0.46.2-py3-none-any.whl.metadata (6.2 kB)
  Collecting tomlkit<0.14.0,>=0.12.0 (from gradio)
    Downloading tomlkit-0.13.2-py3-none-any.whl.metadata (2.7 kB)
  Requirement already satisfied: typer<1.0,>=0.12 in /usr/local/lib/python3.11/dist-packages (from gradio) (0.15.3)
  Requirement already satisfied: typing-extensions~=4.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (4.13.2)
  Collecting uvicorn>=0.14.0 (from gradio)
    Downloading uvicorn-0.34.2-py3-none-any.whl.metadata (6.5 kB)
  Requirement already satisfied: fsspec in /usr/local/lib/python3.11/dist-packages (from gradio-client==1.10.0->gradio) (2025.3.2)
  Requirement already satisfied: websockets<16.0,>=10.0 in /usr/local/lib/python3.11/dist-packages (from gradio-client==1.10.0->gra
  Requirement already satisfied: idna>=2.8 in /usr/local/lib/python3.11/dist-packages (from anyio<5.0,>=3.0->gradio) (3.10)
  Requirement already satisfied: sniffio>=1.1 in /usr/local/lib/python3.11/dist-packages (from anyio<5.0,>=3.0->gradio) (1.3.1)
  Requirement already satisfied: certifi in /usr/local/lib/python3.11/dist-packages (from httpx>=0.24.1->gradio) (2025.4.26)
  Requirement already satisfied: httpcore==1.* in /usr/local/lib/python3.11/dist-packages (from httpx>=0.24.1->gradio) (1.0.9)
  Requirement already satisfied: h11>=0.16 in /usr/local/lib/python3.11/dist-packages (from httpcore==1.*->httpx>=0.24.1->gradio) (
  Requirement already satisfied: filelock in /usr/local/lib/python3.11/dist-packages (from huggingface-hub>=0.28.1->gradio) (3.18.0
  Requirement already satisfied: requests in /usr/local/lib/python3.11/dist-packages (from huggingface-hub>=0.28.1->gradio) (2.32.3
  Requirement already satisfied: tqdm>=4.42.1 in /usr/local/lib/python3.11/dist-packages (from huggingface-hub>=0.28.1->gradio) (4.
  Requirement already satisfied: python-dateutil>=2.8.2 in /usr/local/lib/python3.11/dist-packages (from pandas<3.0,>=1.0->gradio)
  Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.11/dist-packages (from pandas<3.0,>=1.0->gradio) (2025.2)
  Requirement already satisfied: tzdata>=2022.7 in /usr/local/lib/python3.11/dist-packages (from pandas<3.0,>=1.0->gradio) (2025.2)
  Requirement already satisfied: annotated-types>=0.6.0 in /usr/local/lib/python3.11/dist-packages (from pydantic<2.12,>=2.0->gradi
  Requirement already satisfied: pydantic-core==2.33.2 in /usr/local/lib/python3.11/dist-packages (from pydantic<2.12,>=2.0->gradio
```

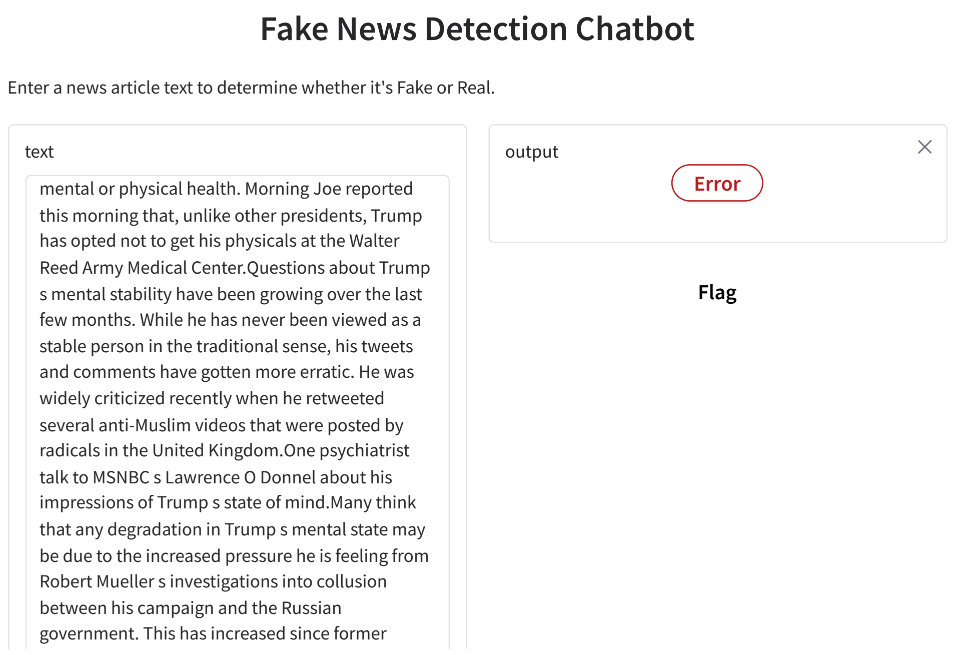
17. Create a Prediction Function

```
def fake_news_predictor(text):
    pred = model.predict([text])[0]
    proba = model.predict_proba([text])[0][1]
    label = "Fake" if pred == 1 else "Real"
    return f"{label} News (Confidence: {proba:.2f})"
```

18. Create the Gradio Interface

```
iface = gr.Interface(
    fn=fake_news_predictor,
    inputs="text",
    outputs="text",
    title="Fake News Detection Chatbot",
    description="Enter a news article text to determine whether it's Fake or Real."
)

iface.launch()
```

```
It looks like you are running Gradio on a hosted a Jupyter notebook. For the Gradio app to work, sharing must be enabled. Automatica

Colab notebook detected. To show errors in colab notebook, set debug=True in launch()
* Running on public URL: https://290d3857305cafe55e.gradio.live

This share link expires in 1 week. For free permanent hosting and GPU upgrades, run `gradio deploy` from the terminal in the working
```



Fake News Detection Chatbot

Enter a news article text to determine whether it's Fake or Real.

text

mental or physical health. Morning Joe reported this morning that, unlike other presidents, Trump has opted not to get his physicals at the Walter Reed Army Medical Center.Questions about Trump s mental stability have been growing over the last few months. While he has never been viewed as a stable person in the traditional sense, his tweets and comments have gotten more erratic. He was widely criticized recently when he retweeted several anti-Muslim videos that were posted by radicals in the United Kingdom.One psychiatrist talk to MSNBC s Lawrence O Donnel about his impressions of Trump s state of mind.Many think that any degradation in Trump s mental state may be due to the increased pressure he is feeling from Robert Mueller s investigations into collusion between his campaign and the Russian government. This has increased since former

output

Error

Flag