

```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.naive_bayes import MultinomialNB
from sklearn.pipeline import Pipeline
from sklearn.metrics import classification_report, confusion_matrix
import matplotlib.pyplot as plt
import seaborn as sns

file_path = "20000-Utterances-Training-dataset-for-chatbots-virtual-assistant-Bitext-sample.xlsx"
df = pd.read_excel("/content/chatbot_dataset.csv")

print(df.head())
df.dropna(subset=["utterance", "intent"], inplace=True)

X = df['utterance']
y = df['intent']

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

model = Pipeline([
    ('tfidf', TfidfVectorizer(stop_words='english')),
    ('clf', MultinomialNB())
])

model.fit(X_train, y_train)

y_pred = model.predict(X_test)
print("Classification Report:\n")
print(classification_report(y_test, y_pred))

conf_matrix = confusion_matrix(y_test, y_pred)
plt.figure(figsize=(12, 8))
sns.heatmap(conf_matrix, annot=False, cmap='Blues', cbar=True)
plt.title('Confusion Matrix')
plt.xlabel('Predicted')
plt.ylabel('Actual')
plt.show()
```

```

flags      utterance      category \
BILC      I don't have an online account, what do I have... ACCOUNT
BILQZ      can you tell me if i can regisger two accounts... ACCOUNT
BPLC      I have no online account, open one, please ACCOUNT
BIPLD      could you ask an agent how to open an account,... ACCOUNT
BLQC      i want an online account, create one ACCOUNT

```

```

intent
create_account
create_account
create_account
create_account
create_account
lassification Report:

```

	precision	recall	f1-score	support
cancel_order	0.00	0.00	0.00	7
change_order	0.95	0.99	0.97	185
change_shipping_address	1.00	0.86	0.93	22
check_cancellation_fee	1.00	1.00	1.00	72
check_invoices	0.97	0.73	0.84	203
check_payment_methods	1.00	0.80	0.89	54
check_refund_policy	1.00	0.98	0.99	96
complaint	0.98	1.00	0.99	149
contact_customer_service	0.98	1.00	0.99	411
contact_human_agent	1.00	0.97	0.99	205
create_account	0.94	1.00	0.97	424
delete_account	0.94	0.99	0.96	183
delivery_options	0.93	0.97	0.95	72
delivery_period	1.00	0.82	0.90	28
edit_account	1.00	0.52	0.68	27
get_invoice	0.87	0.95	0.91	286
get_refund	0.98	0.99	0.98	230
newsletter_subscription	1.00	0.96	0.98	47
payment_issue	0.94	1.00	0.97	873
place_order	0.00	0.00	0.00	14
recover_password	1.00	1.00	1.00	197
registration_problems	1.00	0.15	0.27	26
review	1.00	0.97	0.99	116
set_up_shipping_address	1.00	0.84	0.91	19
switch_account	0.96	0.91	0.93	55
track_order	0.94	0.99	0.96	245
track_refund	1.00	0.84	0.91	61
accuracy			0.96	4307
macro avg	0.90	0.82	0.85	4307
weighted avg	0.95	0.96	0.95	4307

```

usr/local/lib/python3.11/dist-packages/sklearn/metrics/_classification.py:1565: UndefinedMetricWarning: Precision is ill-defined an
_warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
usr/local/lib/python3.11/dist-packages/sklearn/metrics/_classification.py:1565: UndefinedMetricWarning: Precision is ill-defined an
_warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))
usr/local/lib/python3.11/dist-packages/sklearn/metrics/_classification.py:1565: UndefinedMetricWarning: Precision is ill-defined an
_warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

```

