

logistic-regression-28

March 10, 2025

```
[ ]:
```

```
[ ]: import pandas as pd
      from sklearn.linear_model import LinearRegression
      from pickle import dump
      from pickle import load
```

```
[ ]: df = pd.read_csv(r'/content/claimants.csv')
```

```
[ ]: df.head()
```

```
[ ]: 
```

	CASENUM	ATTORNEY	CLMSEX	CLMINSUR	SEATBELT	CLMAGE	LOSS
0	5	0	0.0	1.0	0.0	50.0	34.940
1	3	1	1.0	0.0	0.0	18.0	0.891
2	66	1	0.0	1.0	0.0	5.0	0.330
3	70	0	0.0	1.0	1.0	31.0	0.037
4	96	1	0.0	1.0	0.0	30.0	0.038

```
[ ]: df
```

```
[ ]: 
```

	CASENUM	ATTORNEY	CLMSEX	CLMINSUR	SEATBELT	CLMAGE	LOSS
0	5	0	0.0	1.0	0.0	50.0	34.940
1	3	1	1.0	0.0	0.0	18.0	0.891
2	66	1	0.0	1.0	0.0	5.0	0.330
3	70	0	0.0	1.0	1.0	31.0	0.037
4	96	1	0.0	1.0	0.0	30.0	0.038
...
1335	34100	1	0.0	1.0	0.0	NaN	0.576
1336	34110	0	1.0	1.0	0.0	46.0	3.705
1337	34113	1	1.0	1.0	0.0	39.0	0.099
1338	34145	0	1.0	0.0	0.0	8.0	3.177
1339	34153	1	1.0	1.0	0.0	30.0	0.688

```
[1340 rows x 7 columns]
```

```
[ ]: correlation = df.corr()
```

```
[ ]: correlation = df['ATTORNEY'].corr(df['LOSS'])  
correlation
```

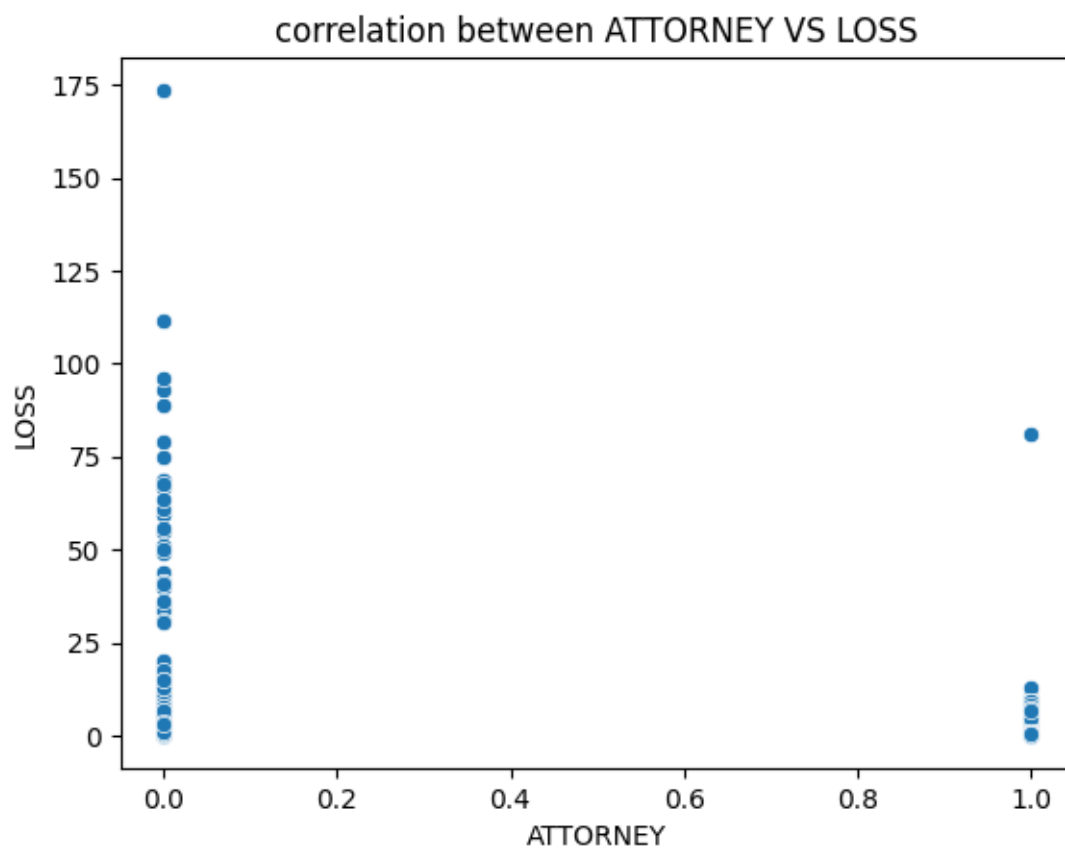
```
[ ]: -0.2197150271023389
```

```
[ ]: correlation = df['ATTORNEY'].corr(df['CLMSEX'])  
correlation
```

```
[ ]: 0.07967388309782608
```

```
[ ]: import matplotlib.pyplot as plt  
import seaborn as sns  
  
sns.scatterplot(x='ATTORNEY', y='LOSS', data=df)  
  
plt.title('correlation between ATTORNEY VS LOSS')  
plt.xlabel('ATTORNEY')  
plt.ylabel('LOSS')  
#plt.show()
```

```
[ ]: Text(0, 0.5, 'LOSS')
```



```
[ ]: import pandas as pd
from sklearn.linear_model import LogisticRegression
from pickle import dump
from pickle import load
claimants = pd.read_csv(r'/content/claimants.csv')
claimants.drop(['CASENUM'], axis=1, inplace=True)
claimants = claimants.dropna()
print(claimants)
X = claimants.iloc[:, [1,2,3,4,5]]
print(X)
Y = claimants.iloc[:,0]
print(Y)
model = LogisticRegression(max_iter=200)
model.fit(X,Y)

dump(model,open('Logistic_Model.sav','wb'))

loaded_model = load(open('Logistic_Model.sav','rb'))
result = loaded_model.score(X,Y)
print(result)
```

	ATTORNEY	CLMSEX	CLMINSUR	SEATBELT	CLMAGE	LOSS
0	0	0.0	1.0	0.0	50.0	34.940
1	1	1.0	0.0	0.0	18.0	0.891
2	1	0.0	1.0	0.0	5.0	0.330
3	0	0.0	1.0	1.0	31.0	0.037
4	1	0.0	1.0	0.0	30.0	0.038
...
1334	1	1.0	1.0	0.0	16.0	0.060
1336	0	1.0	1.0	0.0	46.0	3.705
1337	1	1.0	1.0	0.0	39.0	0.099
1338	0	1.0	0.0	0.0	8.0	3.177
1339	1	1.0	1.0	0.0	30.0	0.688

[1096 rows x 6 columns]

	CLMSEX	CLMINSUR	SEATBELT	CLMAGE	LOSS
0	0.0	1.0	0.0	50.0	34.940
1	1.0	0.0	0.0	18.0	0.891
2	0.0	1.0	0.0	5.0	0.330
3	0.0	1.0	1.0	31.0	0.037
4	0.0	1.0	0.0	30.0	0.038
...
1334	1.0	1.0	0.0	16.0	0.060
1336	1.0	1.0	0.0	46.0	3.705
1337	1.0	1.0	0.0	39.0	0.099
1338	1.0	0.0	0.0	8.0	3.177

```
1339      1.0      1.0      0.0      30.0      0.688
```

```
[1096 rows x 5 columns]
```

```
0      0
```

```
1      1
```

```
2      1
```

```
3      0
```

```
4      1
```

```
..
```

```
1334    1
```

```
1336    0
```

```
1337    1
```

```
1338    0
```

```
1339    1
```

```
Name: ATTORNEY, Length: 1096, dtype: int64
```

```
0.708029197080292
```

```
[ ]: !pip install streamlit
```

```
Requirement already satisfied: streamlit in /usr/local/lib/python3.11/dist-packages (1.42.2)
```

```
Requirement already satisfied: altair<6,>=4.0 in /usr/local/lib/python3.11/dist-packages (from streamlit) (5.5.0)
```

```
Requirement already satisfied: blinker<2,>=1.0.0 in /usr/local/lib/python3.11/dist-packages (from streamlit) (1.9.0)
```

```
Requirement already satisfied: cachetools<6,>=4.0 in /usr/local/lib/python3.11/dist-packages (from streamlit) (5.5.2)
```

```
Requirement already satisfied: click<9,>=7.0 in /usr/local/lib/python3.11/dist-packages (from streamlit) (8.1.8)
```

```
Requirement already satisfied: numpy<3,>=1.23 in /usr/local/lib/python3.11/dist-packages (from streamlit) (1.26.4)
```

```
Requirement already satisfied: packaging<25,>=20 in /usr/local/lib/python3.11/dist-packages (from streamlit) (24.2)
```

```
Requirement already satisfied: pandas<3,>=1.4.0 in /usr/local/lib/python3.11/dist-packages (from streamlit) (2.2.2)
```

```
Requirement already satisfied: pillow<12,>=7.1.0 in /usr/local/lib/python3.11/dist-packages (from streamlit) (11.1.0)
```

```
Requirement already satisfied: protobuf<6,>=3.20 in /usr/local/lib/python3.11/dist-packages (from streamlit) (4.25.6)
```

```
Requirement already satisfied: pyarrow>=7.0 in /usr/local/lib/python3.11/dist-packages (from streamlit) (18.1.0)
```

```
Requirement already satisfied: requests<3,>=2.27 in /usr/local/lib/python3.11/dist-packages (from streamlit) (2.32.3)
```

```
Requirement already satisfied: rich<14,>=10.14.0 in /usr/local/lib/python3.11/dist-packages (from streamlit) (13.9.4)
```

```
Requirement already satisfied: tenacity<10,>=8.1.0 in /usr/local/lib/python3.11/dist-packages (from streamlit) (9.0.0)
```

```
Requirement already satisfied: toml<2,>=0.10.1 in
```

/usr/local/lib/python3.11/dist-packages (from streamlit) (0.10.2)
 Requirement already satisfied: typing-extensions<5,>=4.4.0 in
 /usr/local/lib/python3.11/dist-packages (from streamlit) (4.12.2)
 Requirement already satisfied: watchdog<7,>=2.1.5 in
 /usr/local/lib/python3.11/dist-packages (from streamlit) (6.0.0)
 Requirement already satisfied: gitpython!=3.1.19,<4,>=3.0.7 in
 /usr/local/lib/python3.11/dist-packages (from streamlit) (3.1.44)
 Requirement already satisfied: pydeck<1,>=0.8.0b4 in
 /usr/local/lib/python3.11/dist-packages (from streamlit) (0.9.1)
 Requirement already satisfied: tornado<7,>=6.0.3 in
 /usr/local/lib/python3.11/dist-packages (from streamlit) (6.4.2)
 Requirement already satisfied: jinja2 in /usr/local/lib/python3.11/dist-packages
 (from altair<6,>=4.0->streamlit) (3.1.5)
 Requirement already satisfied: jsonschema>=3.0 in
 /usr/local/lib/python3.11/dist-packages (from altair<6,>=4.0->streamlit)
 (4.23.0)
 Requirement already satisfied: narwhals>=1.14.2 in
 /usr/local/lib/python3.11/dist-packages (from altair<6,>=4.0->streamlit)
 (1.28.0)
 Requirement already satisfied: gitdb<5,>=4.0.1 in
 /usr/local/lib/python3.11/dist-packages (from
 gitpython!=3.1.19,<4,>=3.0.7->streamlit) (4.0.12)
 Requirement already satisfied: python-dateutil>=2.8.2 in
 /usr/local/lib/python3.11/dist-packages (from pandas<3,>=1.4.0->streamlit)
 (2.8.2)
 Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.11/dist-
 packages (from pandas<3,>=1.4.0->streamlit) (2025.1)
 Requirement already satisfied: tzdata>=2022.7 in /usr/local/lib/python3.11/dist-
 packages (from pandas<3,>=1.4.0->streamlit) (2025.1)
 Requirement already satisfied: charset-normalizer<4,>=2 in
 /usr/local/lib/python3.11/dist-packages (from requests<3,>=2.27->streamlit)
 (3.4.1)
 Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.11/dist-
 packages (from requests<3,>=2.27->streamlit) (3.10)
 Requirement already satisfied: urllib3<3,>=1.21.1 in
 /usr/local/lib/python3.11/dist-packages (from requests<3,>=2.27->streamlit)
 (2.3.0)
 Requirement already satisfied: certifi>=2017.4.17 in
 /usr/local/lib/python3.11/dist-packages (from requests<3,>=2.27->streamlit)
 (2025.1.31)
 Requirement already satisfied: markdown-it-py>=2.2.0 in
 /usr/local/lib/python3.11/dist-packages (from rich<14,>=10.14.0->streamlit)
 (3.0.0)
 Requirement already satisfied: pygments<3.0.0,>=2.13.0 in
 /usr/local/lib/python3.11/dist-packages (from rich<14,>=10.14.0->streamlit)
 (2.18.0)
 Requirement already satisfied: smmap<6,>=3.0.1 in
 /usr/local/lib/python3.11/dist-packages (from

gitdb<5,>=4.0.1->gitpython!=3.1.19,<4,>=3.0.7->streamlit) (5.0.2)
Requirement already satisfied: MarkupSafe>=2.0 in
/usr/local/lib/python3.11/dist-packages (from jinja2->altair<6,>=4.0->streamlit)
(3.0.2)
Requirement already satisfied: attrs>=22.2.0 in /usr/local/lib/python3.11/dist-
packages (from jsonschema>=3.0->altair<6,>=4.0->streamlit) (25.1.0)
Requirement already satisfied: jsonschema-specifications>=2023.03.6 in
/usr/local/lib/python3.11/dist-packages (from
jsonschema>=3.0->altair<6,>=4.0->streamlit) (2024.10.1)
Requirement already satisfied: referencing>=0.28.4 in
/usr/local/lib/python3.11/dist-packages (from
jsonschema>=3.0->altair<6,>=4.0->streamlit) (0.36.2)
Requirement already satisfied: rpds-py>=0.7.1 in /usr/local/lib/python3.11/dist-
packages (from jsonschema>=3.0->altair<6,>=4.0->streamlit) (0.23.1)
Requirement already satisfied: mdurl~=0.1 in /usr/local/lib/python3.11/dist-
packages (from markdown-it-py>=2.2.0->rich<14,>=10.14.0->streamlit) (0.1.2)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.11/dist-
packages (from python-dateutil>=2.8.2->pandas<3,>=1.4.0->streamlit) (1.17.0)

```
[ ]: import pandas as pd
import streamlit as st
from sklearn.linear_model import LogisticRegression
st.title('Model Deployment: Logistic Regression')
st.sidebar.header('User Input Parameters')
```

2025-03-04 05:16:57.610 Thread 'MainThread': missing ScriptRunContext! This
warning can be ignored when running in bare mode.
2025-03-04 05:16:57.612 Thread 'MainThread': missing ScriptRunContext! This
warning can be ignored when running in bare mode.
2025-03-04 05:16:57.614 Thread 'MainThread': missing ScriptRunContext! This
warning can be ignored when running in bare mode.
2025-03-04 05:16:57.618 Thread 'MainThread': missing ScriptRunContext! This
warning can be ignored when running in bare mode.

```
[ ]: DeltaGenerator(_root_container=1, _parent=DeltaGenerator())
```

```
[ ]: def user_input_features():
    CLMSEX = st.sidebar.selectbox('Gender', ('1', '0'))
    CLMINSUR = st.sidebar.selectbox('Insurance', ('1', '0'))
    SEATBELT = st.sidebar.selectbox('SeatBelt', ('1', '0'))
    CLMAGE = st.sidebar.number_input("Insert the Age")
    LOSS = st.sidebar.number_input("Insert Loss")
    data = {'CLMSEX': CLMSEX,
            'CLMINSUR': CLMINSUR,
            'SEATBELT': SEATBELT,
            'CLMAGE': CLMAGE,
            'LOSS': LOSS}
    features = pd.DataFrame(data, index = [0])
```

```
return features
```

```
[ ]: df = user_input_features()  
st.subheader('User Input parameters')  
st.write(df)
```

```
2025-03-04 05:16:57.659 Thread 'MainThread': missing ScriptRunContext! This  
warning can be ignored when running in bare mode.  
2025-03-04 05:16:57.663 Thread 'MainThread': missing ScriptRunContext! This  
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2025-03-04 05:16:57.669 Thread 'MainThread': missing ScriptRunContext! This  
warning can be ignored when running in bare mode.  
2025-03-04 05:16:57.670 Session state does not function when running a script  
without `streamlit run`  
2025-03-04 05:16:57.672 Thread 'MainThread': missing ScriptRunContext! This  
warning can be ignored when running in bare mode.  
2025-03-04 05:16:57.674 Thread 'MainThread': missing ScriptRunContext! This  
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2025-03-04 05:16:57.691 Thread 'MainThread': missing ScriptRunContext! This
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 2025-03-04 05:16:57.695 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.
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 2025-03-04 05:16:57.714 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.
 2025-03-04 05:16:57.789 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.
 2025-03-04 05:16:57.794 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

```
[ ]: claimants = pd.read_csv(r'/content/claimants.csv')
      claimants.drop(['CASENUM'], axis=1, inplace=True)
      claimants = claimants.dropna()
      print(claimants)
```

	ATTORNEY	CLMSEX	CLMINSUR	SEATBELT	CLMAGE	LOSS
0	0	0.0	1.0	0.0	50.0	34.940
1	1	1.0	0.0	0.0	18.0	0.891
2	1	0.0	1.0	0.0	5.0	0.330
3	0	0.0	1.0	1.0	31.0	0.037
4	1	0.0	1.0	0.0	30.0	0.038
...
1334	1	1.0	1.0	0.0	16.0	0.060
1336	0	1.0	1.0	0.0	46.0	3.705
1337	1	1.0	1.0	0.0	39.0	0.099
1338	0	1.0	0.0	0.0	8.0	3.177
1339	1	1.0	1.0	0.0	30.0	0.688

[1096 rows x 6 columns]

```
[ ]: x = claimants.iloc[:,[1,2,3,4,5]]
     y = claimants.iloc[:,0]
```

```
[ ]: clf = LogisticRegression()
     clf.fit(x,y)
     prediction = clf.predict(df)
     prediction_proba = clf.predict_proba(df)
```

```
[ ]: st.subheader('Prediction Result')
     st.write('Yes' if prediction_proba[0][1] > 0.5 else 'No')
     st.subheader('Prediction Probability')
     st.write(prediction_proba)
```

2025-03-04 05:16:57.930 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-03-04 05:16:57.933 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-03-04 05:16:57.936 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-03-04 05:16:57.939 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

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2025-03-04 05:16:57.944 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-03-04 05:16:57.946 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

2025-03-04 05:16:57.949 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

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2025-03-04 05:16:57.953 Thread 'MainThread': missing ScriptRunContext! This warning can be ignored when running in bare mode.

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