In [ ]:

```
import numpy as np
import pandas as pd
from sklearn.linear_model import LogisticRegression
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score
from sklearn.preprocessing import LabelEncoder
import matplotlib.pyplot as plt
import seaborn as sns
```

In [ ]:

```
# Load the dataset
df = pd.read_csv("accident.csv", sep = ',')
```

In [ ]:

```
df
```

Out[ ]:

	Age	Gender	Speed_of_Impact	Helmet_Used	Seatbelt_Used	Survived
0	56	Female	27.0	No	No	1
1	69	Female	46.0	No	Yes	1
2	46	Male	46.0	Yes	Yes	0
3	32	Male	117.0	No	Yes	0
4	60	Female	40.0	Yes	Yes	0
...	...	...	...	...	...	...
195	69	Female	111.0	No	Yes	1
196	30	Female	51.0	No	Yes	1
197	58	Male	110.0	No	Yes	1
198	20	Male	103.0	No	Yes	1
199	56	Female	43.0	No	Yes	1

200 rows × 6 columns

```
In [ ]: print(df.isna().sum())
```

```
Age                 0
Gender              1
Speed_of_Impact     3
Helmet_Used         0
Seatbelt_Used       0
Survived            0
dtype: int64
```

```
In [ ]: mean=df["Speed_of_Impact"].mean()
```

```
In [ ]: df["Speed_of_Impact"].fillna(mean, inplace=True)
```

```
C:\Users\Asus\AppData\Local\Temp\ipykernel_4104\3290107872.py:1: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series through chained
assignment using an inplace method.
The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on which we are setting values always behaves as a
copy.

For example, when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col] = df[col].method(value) instead, t
o perform the operation inplace on the original object.


  df["Speed_of_Impact"].fillna(mean, inplace=True)
```

```
In [ ]: df.dropna()
```

Out[ ]:

	Age	Gender	Speed_of_Impact	Helmet_Used	Seatbelt_Used	Survived
0	56	Female	27.0	No	No	1
1	69	Female	46.0	No	Yes	1
2	46	Male	46.0	Yes	Yes	0
3	32	Male	117.0	No	Yes	0
4	60	Female	40.0	Yes	Yes	0
...	...	...	...	...	...	...
195	69	Female	111.0	No	Yes	1
196	30	Female	51.0	No	Yes	1
197	58	Male	110.0	No	Yes	1
198	20	Male	103.0	No	Yes	1
199	56	Female	43.0	No	Yes	1

199 rows × 6 columns

In [ ]:

```
label_encoder=LabelEncoder()
df["Gender"]= label_encoder.fit_transform(df["Gender"])
df["Helmet_Used"]= label_encoder.fit_transform(df["Helmet_Used"])
df["Seatbelt_Used"]= label_encoder.fit_transform(df["Seatbelt_Used"])
```

In [ ]:

```
df
```

Out[ ]:

	Age	Gender	Speed_of_Impact	Helmet_Used	Seatbelt_Used	Survived
0	56	0	27.0	0	0	1
1	69	0	46.0	0	1	1
2	46	1	46.0	1	1	0
3	32	1	117.0	0	1	0
4	60	0	40.0	1	1	0
...	...	...	...	...	...	...
195	69	0	111.0	0	1	1
196	30	0	51.0	0	1	1
197	58	1	110.0	0	1	1
198	20	1	103.0	0	1	1
199	56	0	43.0	0	1	1

200 rows × 6 columns

In [ ]:

```
print(df['Survived'].value_counts(normalize=True))
```

```
Survived
1    0.505
0    0.495
Name: proportion, dtype: float64
```

In [ ]:

```
X = df.drop(["Survived"],axis=1)
y = df["Survived"].values


# Splitting data into training (80%) and testing (20%) sets
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=100)

# Initializing the logistic regression model
model = LogisticRegression()
```

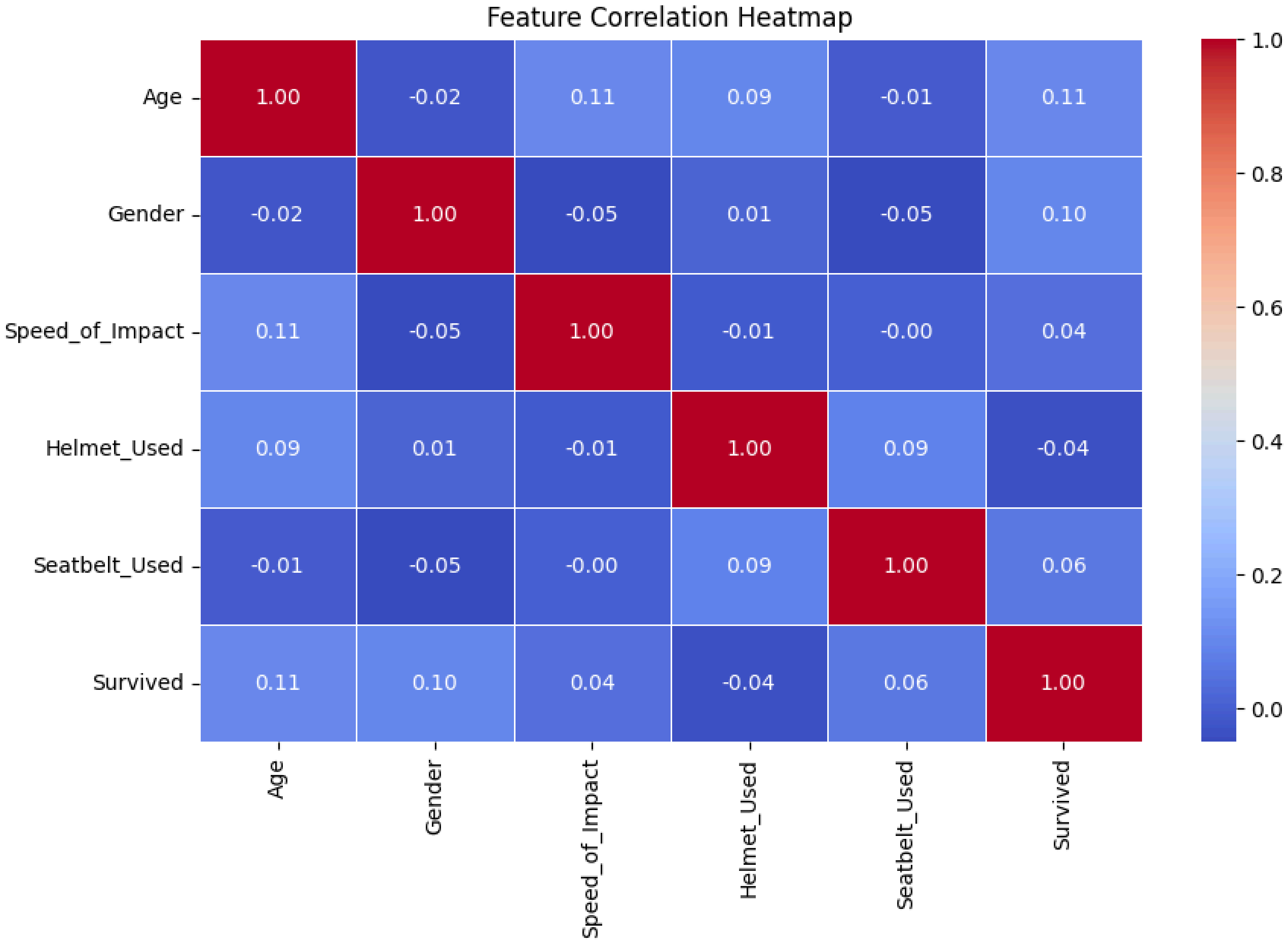
```
# Training the model
model.fit(X_train, y_train)

# Predicting survival on the test set
y_pred = model.predict(X_test)

# Evaluating accuracy
accuracy = accuracy_score(y_test, y_pred)
print(f"Model Accuracy: {accuracy:.2f}")


# Making predictions for new cases
new_cases = np.array([
    [40,1,100,0,0],
    [90,0,56,0,1]
])
predictions = model.predict(new_cases)
print(f"Predicted : {predictions}")
```

```
Model Accuracy: 0.68
Predicted : [1 1]
```

```
C:\Users\Asus\AppData\Local\Packages\PythonSoftwareFoundation.Python.3.12_qbz5n2kfra8p0\LocalCache\local-packages\Python312\site-packages\sklearn\utils\validation.py:2739: UserWarning: X does not have valid feature names, but LogisticRegression was fitted with feature names
  warnings.warn(
```

In [ ]:

```
corr_matrix = df.corr()
plt.figure(figsize=(10, 6))
sns.heatmap(corr_matrix, annot=True, fmt=".2f", cmap="coolwarm", linewidths=0.5)
plt.title("Feature Correlation Heatmap")
plt.show()
```


Feature Correlation Heatmap
Age
Gender
Speed_of_Impact
Helmet_Used
Seatbelt_Used
Survived
1.00 -0.02 0.11 0.09 -0.01 0.11
-0.02 1.00 -0.05 0.01 -0.05 0.10
0.11 -0.05 1.00 -0.01 -0.00 0.04
0.09 0.01 -0.01 1.00 0.09 -0.04
-0.01 -0.05 -0.00 0.09 1.00 0.06
0.11 0.10 0.04 -0.04 0.06 1.00
Age
Gender
Speed_of_Impact
Helmet_Used
Seatbelt_Used
Survived
1.0
0.8
0.6
0.4
0.2
0.0