PHASE 3:DOCUMENTATION

Credit Card Fraud Detection in loading and preprocessing the dataset

The IMDb dataset typically includes a variety of features that describe different aspects of a movie.

While the exact features can vary depending on the dataset and the source,

here are some common features you might find in an IMDb dataset:

The Credit card fraud detection dataset extracted from kaggle platform accurately consists of 31 columns with 2 lakhs+ entries.

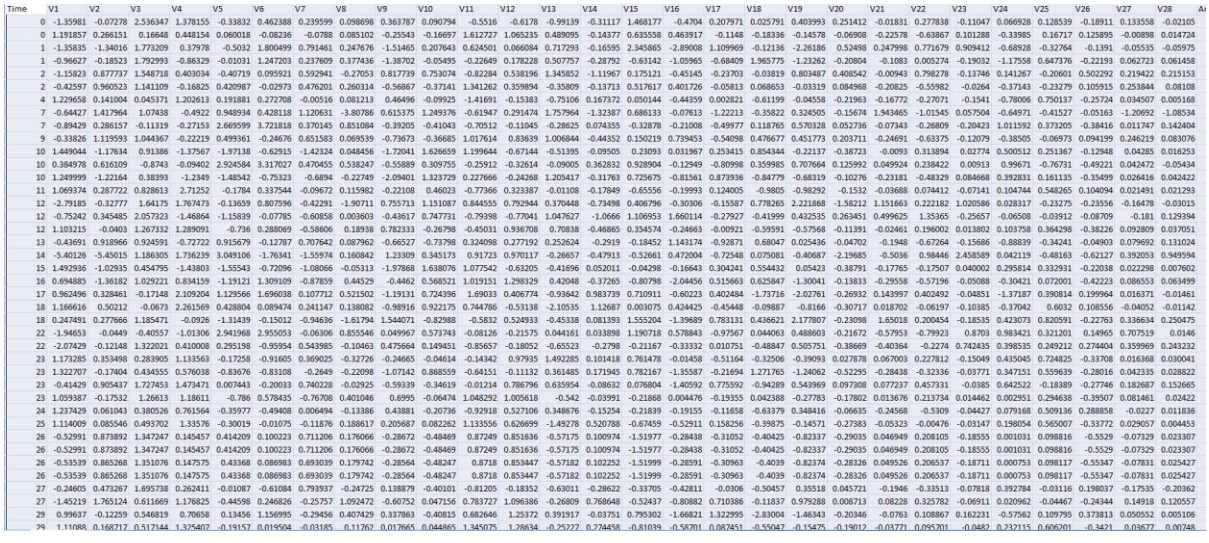
COLUMN NAMES

>Time

>V1-V28

>Amount

>Class



Time	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25	V26	V27	V28	A
0	-1.35981	-0.07278	2.536347	1.378155	-0.33832	0.462388	0.239599	0.098698	0.363787	0.090794	-0.5516	-0.6178	-0.99139	-0.31117	1.468177	-0.4704	0.207971	0.025791	0.403993	0.251412	-0.01831	0.277838	-0.11047	0.066928	0.128539	-0.18911	0.133558	-0.02105	
0	1.191857	0.266151	0.16648	0.448154	0.060018	-0.08236	-0.0788	0.085102	-0.25543	-0.16697	1.612727	1.065235	0.489095	-0.14377	0.635558	0.463917	-0.1148	-0.18336	-0.14578	-0.06908	-0.22578	-0.63867	0.101288	-0.33985	0.16717	0.125895	-0.00898	0.014724	
1	-1.35835	-1.34016	1.773209	0.37978	-0.5032	1.800499	0.791461	0.247676	-1.51465	0.207643	0.624501	0.066084	0.717293	-0.16595	2.345865	-2.89008	1.109969	-0.12136	-2.26186	0.52498	0.247998	0.771679	0.909412	-0.68928	-0.32764	-0.1391	-0.05535	-0.05975	
1	-0.96627	-0.18523	1.792993	-0.86329	-0.01031	1.247203	0.237609	0.377436	-1.38702	-0.05495	-0.22649	0.178228	0.507757	-0.28792	-0.63142	-1.05965	-0.68409	1.965775	-1.23262	-0.20804	-0.1083	0.005274	-0.19032	-1.17558	0.647376	-0.22193	0.062723	0.061458	
2	-1.15823	0.877737	1.548718	0.403034	-0.40719	0.095921	0.592941	-0.27053	0.817739	0.753074	-0.82284	0.538196	1.345852	-1.11967	0.175121	-0.45145	-0.23703	-0.03819	0.803487	0.408542	-0.00943	0.798278	-0.13746	0.141267	-0.20601	0.502292	0.219422	0.215153	
2	-0.42597	0.960523	1.141109	-0.16825	0.420987	-0.02973	0.476201	0.260314	-0.56867	-0.37141	1.341262	0.359894	-0.35809	-0.13713	0.517617	0.401726	-0.05813	0.068653	-0.03319	0.084968	-0.20825	-0.55982	-0.0264	-0.37143	-0.23279	0.105915	0.253844	0.08108	
4	1.229658	0.141004	0.045371	1.202613	0.191881	0.272708	-0.00516	0.081213	0.46496	-0.09925	-1.41691	-0.15383	-0.75106	0.167372	0.050144	-0.44359	0.002821	-0.61199	-0.04558	-0.21963	-0.16772	-0.27071	-0.1541	-0.78006	0.750137	-0.25724	0.034507	0.005168	
7	-0.64427	1.417964	1.07438	-0.4922	0.948934	0.428118	1.120631	-3.80786	0.615375	1.249376	-0.61947	0.291474	1.757964	-1.32387	0.686133	-0.07613	-1.22213	-0.35822	0.324505	-0.15674	1.943465	-1.01545	0.057504	-0.64971	-0.41527	-0.05163	-1.20692	-1.08534	
7	-0.89429	0.286157	-0.11319	-0.27153	2.669599	3.721818	0.370145	0.851084	-0.39205	-0.41043	-0.70512	-0.11045	-0.28625	0.074355	-0.32878	-0.21008	-0.49977	0.118765	0.570328	0.052736	-0.07343	-0.26809	-0.20423	1.011592	0.373205	-0.38416	0.011747	0.142404	
9	-0.33826	1.119593	1.044367	-0.22219	0.499361	-0.24676	0.651583	0.069539	-0.73673	-0.36685	1.017614	0.83639	1.006844	-0.44352	0.150219	0.739453	-0.54098	0.476677	0.451773	0.203711	-0.24691	-0.63375	-0.12079	-0.38505	-0.06973	0.094199	0.246219	0.083076	
10	1.449044	-1.17634	0.91386	-1.37567	-1.97138	-0.62915	-1.42324	0.048456	-1.72041	1.626659	1.199644	-0.67144	-0.51395	-0.09505	0.23093	0.031967	0.253415	0.854344	-0.22137	-0.38723	-0.0093	0.313894	0.02774	0.500512	0.251367	-0.12948	0.04285	0.016253	
10	0.384978	0.616109	-0.8743	-0.09402	2.924584	3.317027	0.470455	0.538247	-0.55889	0.309755	-0.25912	-0.32614	-0.09005	0.362832	0.928904	-0.12949	-0.80998	0.359985	0.707664	0.125992	0.049924	0.238422	0.00913	0.99671	-0.76731	-0.49221	0.042472	-0.05434	
10	1.249999	-1.22164	0.38393	-1.2349	-1.48542	-0.75323	-0.6894	-0.22749	-2.09401	1.323729	0.227666	-0.24268	1.205417	-0.31763	0.725675	-0.81561	0.873936	-0.84779	-0.68319	-0.10276	-0.23181	-0.48329	0.084668	0.392831	0.161135	-0.35499	0.026416	0.042422	
11	1.069374	0.287722	0.828613	2.71252	-0.1784	0.337544	-0.09672	0.115982	-0.22108	0.46023	-0.77366	0.323387	-0.01108	-0.17849	-0.65556	-0.19993	0.124005	-0.9805	-0.98292	-0.1532	-0.03688	0.074412	-0.07141	0.104744	0.548265	0.104094	0.021491	0.021293	
12	-2.79185	-0.32777	1.64175	1.767473	-0.13659	0.807596	-0.42291	-1.90711	0.755713	1.151087	0.844555	0.792944	0.370448	-0.73498	0.406796	-0.30306	-0.15587	0.778265	2.221868	-1.58212	1.151663	0.222182	1.020586	0.028317	-0.23275	-0.23556	-0.16478	-0.03015	
12	-0.75242	0.345485	2.057323	-1.46864	-1.15839	-0.07785	-0.60858	0.003603	-0.43617	0.747731	-0.79398	-0.77041	1.047627	-1.0666	1.106953	1.660114	-0.27927	-0.41999	0.432535	0.263451	0.499625	1.35365	-0.25657	-0.06508	-0.03912	-0.08709	-0.181	0.129394	
12	1.103215	-0.0403	1.267332	1.289091	-0.736	0.288069	-0.58606	0.18938	0.782333	-0.26798	-0.45031	0.936708	0.70838	-0.46865	0.354574	-0.24663	-0.00921	-0.59591	-0.57568	-0.11391	-0.02461	0.196002	0.013802	0.103758	0.364298	-0.38226	0.092809	0.037051	
13	-0.43691	0.918966	0.924591	-0.72722	0.915679	-0.12787	0.707642	0.087962	-0.66527	-0.73798	0.324098	0.277192	0.252624	-0.2919	-0.18452	1.143174	-0.92871	0.68047	0.025436	-0.04702	-0.1948	-0.67264	-0.15686	-0.88839	-0.34241	-0.04903	0.079692	0.131024	
14	-5.40126	-5.45015	1.186305	1.736239	3.049106	-1.76341	-1.55974	0.160842	1.23309	0.345173	0.91723	0.970117	-0.26657	-0.47913	-0.52661	0.472004	-0.72548	0.075081	-0.40687	-2.19685	-0.5036	0.98446	2.458589	0.042119	-0.48163	-0.62127	0.392053	0.949594	
15	1.492936	-1.02935	0.454795	-1.43803	-1.55543	-0.72096	-1.08066	-0.05313	-1.97868	1.638076	1.077542	-0.63205	-0.41696	0.052011	-0.04298	-0.16643	0.304241	0.554432	0.05423	-0.38791	-0.17765	-0.17507	0.040002	0.295814	0.332931	-0.22038	0.022298	0.007602	
16	0.694885	-1.36182	1.029221	0.834159	-1.19121	1.309109	-0.87859	0.44529	-0.4462	0.568521	1.019151	1.298329	0.42048	-0.37265	-0.80798	-2.04456	0.515663	0.625447	-1.30041	-0.13833	-0.29558	-0.57196	-0.05088	-0.30421	0.072001	-0.42223	0.086553	0.063499	
17	0.962496	0.328461	-0.17148	2.109204	1.129566	1.696038	0.107712	0.521502	-1.19131	0.724396	1.69033	0.406774	-0.93642	0.983739	0.710911	-0.60223	0.402484	-1.73716	-2.02761	-0.26932	0.143997	0.402492	-0.04851	-1.37187	0.390814	0.199964	0.016371	-0.01461	
18	1.166616	0.50212	-0.0673	2.261569	0.428804	0.089474	0.241147	0.138082	-0.98916	0.922175	0.744786	-0.53138	-2.10535	1.12687	0.003075	0.424425	-0.45448	-0.09887	-0.8166	-0.30717	0.018702	-0.06197	-0.10385	-0.37042	0.6032	0.108556	-0.04052	-0.01142	
18	0.247491	0.277666	1.185471	-0.0926	-1.31439	-0.15012	-0.94636	-1.61794	1.544071	-0.82988	-0.5832	0.524933	-0.45338	0.081393	1.555204	-1.39689	0.783131	0.436621	2.177807	-0.23098	1.65018	0.200454	-0.18535	0.423073	0.820591	-0.22763	0.336634	0.250475	
22	-1.94653	-0.0449	-0.40557	-1.01306	2.941968	2.955053	-0.06306	0.855546	0.049967	0.573743	-0.08126	-0.21575	0.044161	0.033898	1.190718	0.578843	-0.97567	0.044063	0.488603	-0.21672	-0.57953	-0.79923	0.8703	0.983421	0.321201	0.14965	0.707519	0.0146	
22	-2.07429	-0.12148	1.322021	0.410008	0.295198	-0.95954	0.543985	-0.10463	0.475664	0.149451	-0.85657	-0.18052	-0.65523	-0.2798	-0.21167	-0.33332	0.010751	-0.48847	0.505751	-0.38669	-0.40364	-0.2274	0.742435	0.398535	0.249212	0.274404	0.359969	0.243232	
23	1.173285	0.353498	0.283905	1.133563	-0.17258	-0.91605	0.369025	-0.32726	-0.24665	-0.04614	-0.14342	0.97935	1.492285	0.101418	0.761478	-0.01458	-0.51164	-0.32506	-0.39093	0.027878	0.067003	0.227812	-0.15049	0.435045	0.724825	-0.33708	0.016368	0.030041	
23	1.322707	-0.17404	0.434555	0.576038	-0.83676	-0.83108	-0.2649	-0.22098	-1.07142	0.868559	-0.64151	-0.11132	0.361485	0.171945	0.782167	-1.35587	-0.21694	1.271765	-1.24062	-0.52295	-0.28438	-0.32336	-0.03771	0.347151	0.559639	-0.28016	0.042335	0.028822	
23	-0.41429	0.905437	1.727453	1.473471	0.007443	-0.20033	0.740228	-0.02925	-0.59339	-0.34619	-0.01214	0.786796	0.635954	-0.08632	0.076804	-1.40592	0.775592	-0.94289	0.543969	0.097308	0.077237	0.457331	-0.0385	0.642522	-0.18389	-0.27746	0.182687	0.152665	
23	1.059387	-0.17532	1.26613	1.18611	-0.786	0.578435	-0.76708	0.401046	0.6995	-0.06474	1.048292	1.005618	-0.542	-0.03991	-0.21868	0.004476	-0.19355	0.042388	-0.27783	-0.17802	0.013676	0.213734	0.014462	0.002951	0.294638	-0.39507	0.081461	0.02422	
24	1.237429	0.061043	0.380526	0.761564	-0.35977	-0.49408	0.006494	-0.13386	0.43881	-0.20736	-0.92918	0.527106	0.348676	-0.15254	-0.21839	-0.19155	-0.11658	-0.63379	0.348416	-0.06635	-0.24568	-0.5309	-0.04427	0.079168	0.509136	0.288858	-0.0227	0.011836	
25	1.114009	0.085546	0.493702	1.33576	-0.30019	-0.01075	-0.11876	0.188617	0.205687	0.082262	1.133556	0.626699	-1.49278	0.520788	-0.67459	-0.52911	0.158256	-0.39875	-0.14571	-0.27383	-0.05323	-0.00476	-0.03147	0.198054	0.565007	-0.33772	0.029057	0.004453	
26	-0.52991	0.873892	1.347247	0.145457	0.414209	0.100223	0.711206	0.176066	-0.28672	-0.48469	0.87249	0.851636	-0.57175	0.100974	-1.51977	-0.28438	-0.31052	-0.40425	-0.82337	-0.29035	0.046949	0.208105	-0.18555	0.001031	0.098816	-0.5529	-0.07329	0.023307	
26	-0.52991	0.873892	1.347247	0.145457	0.414209	0.100223	0.711206	0.176066	-0.28672	-0.48469	0.87249	0.851636	-0.57175	0.100974	-1.51977	-0.28438	-0.31052	-0.40425	-0.82337	-0.29035	0.046949	0.208105	-0.18555	0.001031	0.098816	-0.5529	-0.07329	0.023307	
26	-0.53539	0.865268	1.351076	0.147575	0.43368	0.086983	0.693039	0.179742	-0.28564	-0.48247	0.8718	0.853447	-0.57182	0.102252	-1.51999	-0.28591	-0.30963	-0.4039	-0.82374	-0.28326	0.049526	0.206537	-0.18711	0.000753	0.098117	-0.55347	-0.07831	0.025427	
26	-0.53539	0.865268	1.351076	0.147575	0.43368	0.086983	0.693039	0.179742	-0.28564	-0.48247	0.8718	0.853447	-0.57182	0.102252	-1.51999	-0.28591	-0.30963	-0.4039	-0.82374	-0.28326	0.049526	0.206537	-0.18711	0.000753	0.098117	-0.55347	-0.07831	0.025427	
27	-0.24605	0.473267	1.695738	0.262411	-0.01087	-0.61084	0.793937	-0.24725	0.138879	-0.40101	-0.81205	-0.18352	-0.63011	-0.28622	-0.33705	-0.42811	-0.0306	-0.50457	0.35518	0.045721	-0.1946	-0.33513	-0.07818	0.392784	-0.03116	0.198037	-0.17535	-0.20362	
27	-1.45219	1.765124	0.611669	1.176825	-0.44598	0.246826	-0.25757	1.092472	-0.60752	0.047156	0.783727	1.096386	-0.26809	0.768648	-0.52437	-0.80882	0.710386	-0.11837	0.979288	0.008713	0.08228	0.325782	-0.06911	0.020962	-0.04467	-0.24344	0.14918	0.120557	
29	0.99637	-0.12259	0.546819	0.70658	0.13456	1.156995	-0.29456	0.407429	0.337863	-0.40815	0.682646	1.25372	0.391917	-0.03751	0.795302	-1.66821	1.322995	-2.83004	-1.46343	-0.20346	-0.0763	0.108867	0.162231	-0.57562	0.109795	0.373813	0.050552	0.005106	
29	1.11088	0.168717	0.517144	1.325407	-0.19157	0.019504	-0.03185	0.11762	0.017665	0.044865	1.345075	1.28634	-0.25222	0.274458	-0.81039	-0.58701	0.087451	-0.55047	-0.15475	-0.19012	-0.03771	0.095701	-0.0482	0.232115	0.606201	-0.3421	0.03677	0.00748	

NOTE:

The initial columns from the dataset is displayed above for you perusal.

MODEL DEVELOPMENT

DATA PREPROCESSING

Logistic regression is a fundamental and highly interpretable algorithm that offers several advantages when applied to credit card fraud detection. Its simplicity makes it an excellent starting point for developing fraud detection models. This algorithm is particularly well-suited for binary classification problems, which are inherent in fraud detection, where the goal is to distinguish between genuine and fraudulent transactions

```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler

# Load the dataset (replace 'data.csv' with your dataset file)
data = pd.read_csv('data.csv')

# Split the data into features (X) and the target variable (y)
X = data.drop('Class', axis=1)
y = data['Class']

# Split the data into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)

# Standardize the features (mean = 0, variance = 1)
scaler = StandardScaler()
X_train = scaler.fit_transform(X_train)
X_test = scaler.transform(X_test)

# Your data is now preprocessed and ready for training a fraud detection model.
```

The logistic regression algorithm is selected due to its enormous benefits notably its straightforward and intuitive model interpretation makes it valuable in fields requiring transparency, like healthcare and finance.