

Predicting Survival Time for Cirrhosis Patients Using ARTIFICIAL NEURAL NETWORK (ANN)

Using Python, Pandas, Numpy, and Matplotlib

OBJECTIVE

To predict survival time for cirrhosis patients based on clinical features.

- Predicting survival time helps healthcare providers prioritize care and better plan treatments for high-risk patients.

Overview of Dataset

Cirrhosis dataset contains clinical data on patients with liver disease

duration	status	drug	age	sex	ascites	hepatomology	spiders	edema	bilirubin	cholesterol	albumin	copper	phosphatase	SGOT	triglycerides	platelets	prothrombin	stage
400	2	1	21464	1	1	1	1	1.0	14.5	261.0	2.60	156.0	1718.0	137.95	172.0	190.0	12.2	4
4500	0	1	20617	1	0	1	1	0.0	1.1	302.0	4.14	54.0	7394.8	113.52	88.0	221.0	10.6	3
1012	2	1	25594	0	0	0	0	0.5	1.4	176.0	3.48	210.0	516.0	96.10	55.0	151.0	12.0	4
1925	2	1	19994	1	0	1	1	0.5	1.8	244.0	2.54	64.0	6121.8	60.63	92.0	183.0	10.3	4
1504	1	2	13918	1	0	1	1	0.0	3.4	279.0	3.53	143.0	671.0	113.15	72.0	136.0	10.9	3

Key Features:

- **Demographic:** Age, sex
- **Clinical Metrics:** Bilirubin, albumin, copper, SGOT, cholesterol, and more.

Target Variable: duration (survival time), a continuous variable for prediction.

Data Preprocessing

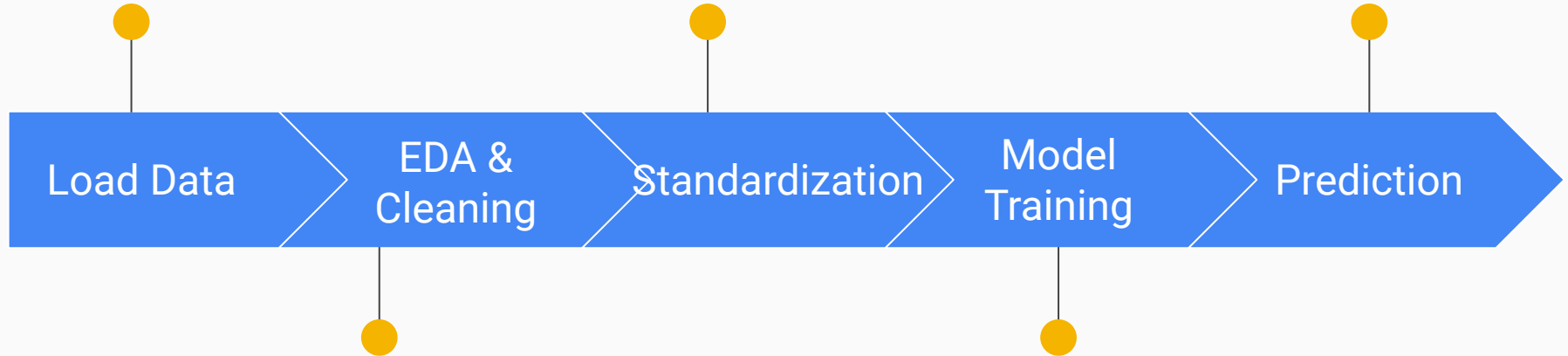
- Missing Values: Filled with column means to avoid loss of data.
- Normalization: Essential columns were normalized to improve model convergence.

Procedure

The dataset is loaded into a dataframe

Feature scaling is performed to improve model effectiveness

Model predictions are done on the Test dataset. An accuracy of 97% is recorded



Null values are filled with means and plots are created for insights and analysis

Dataset is split into Training and Test. Model is trained with the training dataset

Summary

Successfully built a custom neural network for predicting survival time and achieved reasonable performance on test data.

Future Improvements:

- Experiment by training the model with a huge dataset.
- Tune hyperparameters for improved accuracy.
- Add feature engineering to derive additional insights from clinical data.