

# Analyzing a 10x20 DataFrame with Machine Learning:

## 1. Task Description:

The provided Python notebook analyzes a 10x20 DataFrame with various student data attributes, including age, gender, study hours, attendance, parental education, previous scores, participation, and assignments completed. It then applies machine learning using a Logistic Regression model to predict whether a student will pass or fail based on the given attributes.

## 2. Task Output Screenshot:

- 10\*20 DataFrame

	StudentID	Age	Gender	StudyHours	Attendance	ParentalEducation	PreviousScores	Participation	AssignmentsCompleted	Pass
0	1	24	Female	16	84	2	78	1	8	1
1	2	21	Female	19	73	2	64	4	9	1
2	3	22	Female	18	68	2	50	2	7	1
3	4	24	Female	18	85	2	74	1	5	1
4	5	20	Female	19	61	2	56	5	8	1
5	6	22	Male	18	79	3	58	3	9	1
6	7	22	Male	7	87	3	73	4	8	0
7	8	24	Female	16	66	2	50	3	9	1
8	9	19	Female	11	67	3	57	3	9	1
9	10	20	Female	8	94	1	73	1	7	0
10	11	24	Male	13	73	2	60	3	9	1
11	12	20	Female	7	76	1	66	5	8	0
12	13	20	Male	9	95	1	57	3	9	1
13	14	22	Male	7	99	2	84	1	7	0
14	15	21	Male	11	63	3	84	5	7	1
15	16	20	Male	9	61	1	82	2	8	1
16	17	23	Male	13	65	2	54	3	6	1
17	18	22	Female	11	63	1	88	1	6	1
18	19	19	Female	6	88	1	77	2	9	0
19	20	21	Female	8	77	1	56	2	5	0

- Classification Report For The Following Model:

Classification Report:				
	precision	recall	f1-score	support
0	0.00	0.00	0.00	0
1	1.00	0.50	0.67	4
accuracy			0.50	4
macro avg	0.50	0.25	0.33	4
weighted avg	1.00	0.50	0.67	4

- Output For Custom Datapoint:

```
Age Gender StudyHours Attendance ParentalEducation PreviousScores \
0 21 Male 12 85 2 75

Participation AssignmentsCompleted Predicted Pass
0 4 8 1
```

### 3. Algorithm Used In Task :

The notebook uses the following Python libraries and algorithms:

- Pandas for data manipulation and preprocessing.
- Scikit-learn for machine learning, including the LogisticRegression model.
- Numpy for random number generation.
- One-hot encoding for the 'Gender' column.
- Train-test split for evaluation.
- Accuracy score and classification report for model performance.