

# **Report**

**1- EDA**

**2- PrePrpcessing**

**3-Models used :**

**1- Basic CNN**

**2- Mobile netV2**

**3- EfficientNetB0**

**4- InceptionV3**

## EDA



## Some insights

- The data is uniform distributed
- The Data has un balanced classed **Sedan** is more than other classes)
- No missing or duplicated in data
- Data has 8 classes

# Preprocessing

**Stage1** Convert labels dtypes

**Stage2** DownSampling Data



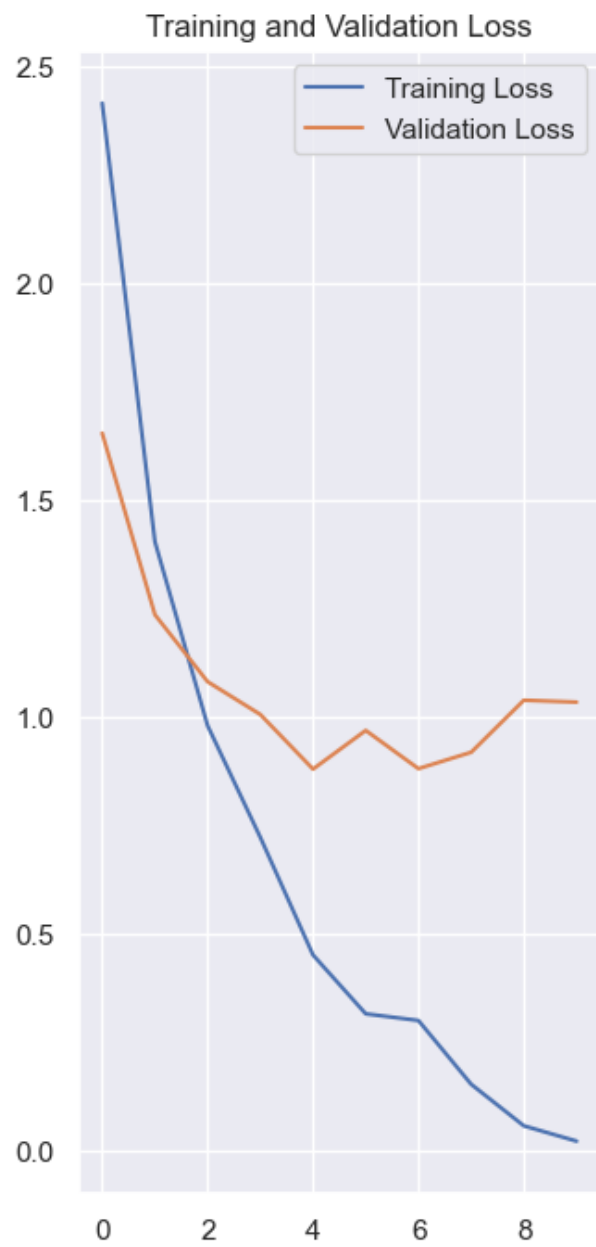
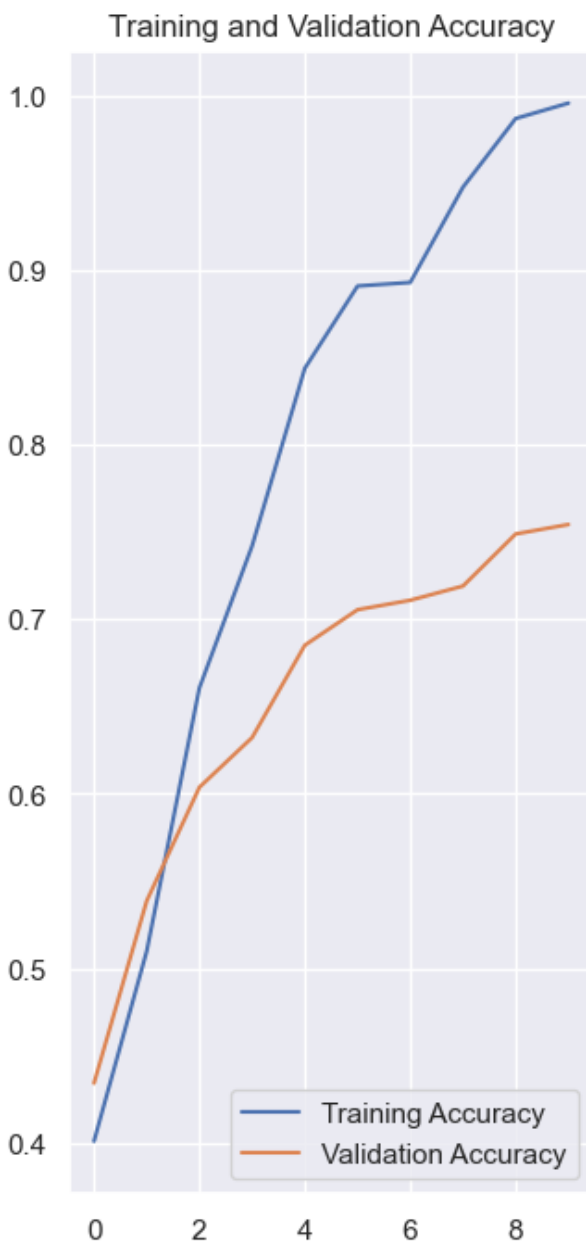
**Stage3** Extract features from images

**Stage4** Normalizing Images

## Stage5 Data Augmentation



## 1- CNN

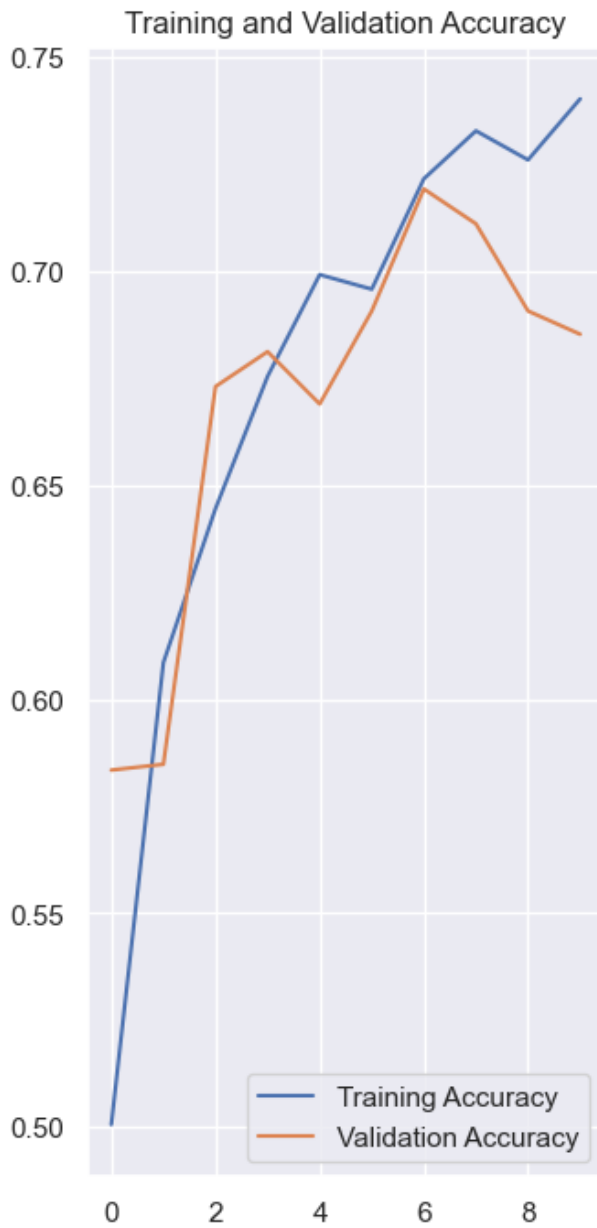


		Confusion Matrix							
Actual	bus	5	0	0	0	0	0	14	1
	crossover	0	58	29	0	10	17	1	5
	hatchback	0	10	63	0	7	22	0	3
	motorcycle	0	0	0	21	1	0	0	0
	pickup-truck	2	6	2	0	61	6	9	4
	sedan	1	8	46	0	5	321	11	4
	truck	2	0	1	0	14	3	39	6
	van	0	5	13	0	13	8	4	62
		bus	crossover	hatchback	motorcycle	pickup-truck	sedan	truck	van
		Predicted							

In [150]: `print(classification_report(test_labels,pred_labels))`

	precision	recall	f1-score	support
0	0.50	0.25	0.33	20
1	0.67	0.48	0.56	120
2	0.41	0.60	0.49	105
3	1.00	0.95	0.98	22
4	0.55	0.68	0.61	90
5	0.85	0.81	0.83	396
6	0.50	0.60	0.55	65
7	0.73	0.59	0.65	105
accuracy			0.68	923
macro avg	0.65	0.62	0.62	923
weighted avg	0.70	0.68	0.69	923

## 2- mobilenet\_v2



```
In [221]: print(classification_report(test_labels,pred_labels))
```

	precision	recall	f1-score	support
0	0.01	0.05	0.02	20
1	0.15	0.48	0.23	120
2	0.00	0.00	0.00	105
3	0.67	0.55	0.60	22
4	0.27	0.13	0.18	90
5	0.32	0.12	0.17	396
6	0.40	0.38	0.39	65
7	0.19	0.30	0.23	105
accuracy			0.20	923
macro avg	0.25	0.25	0.23	923
weighted avg	0.25	0.20	0.19	923

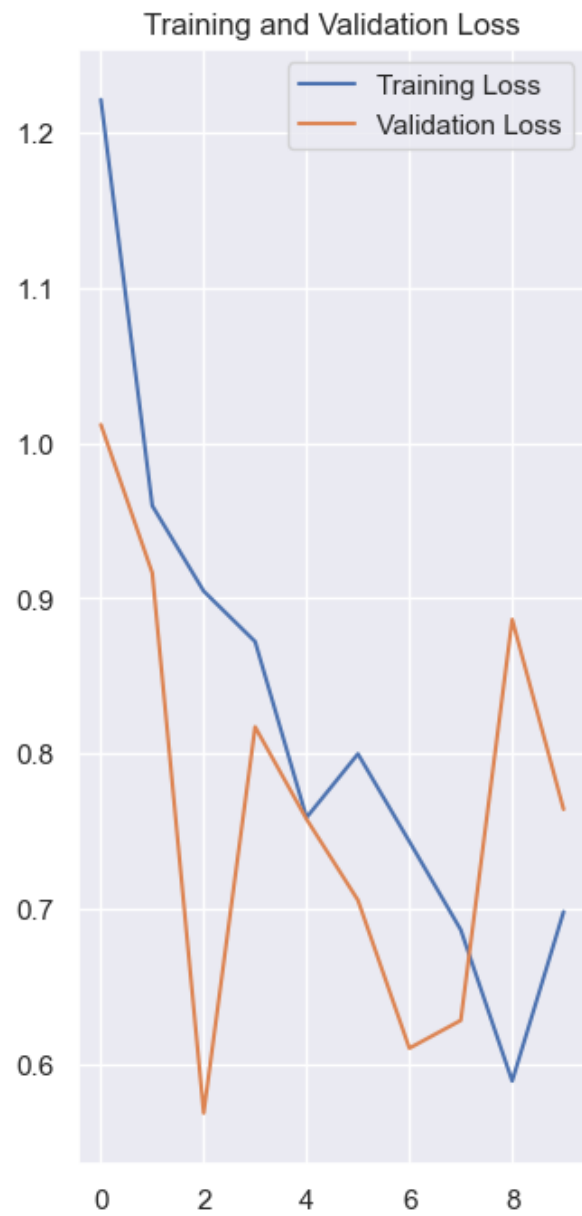
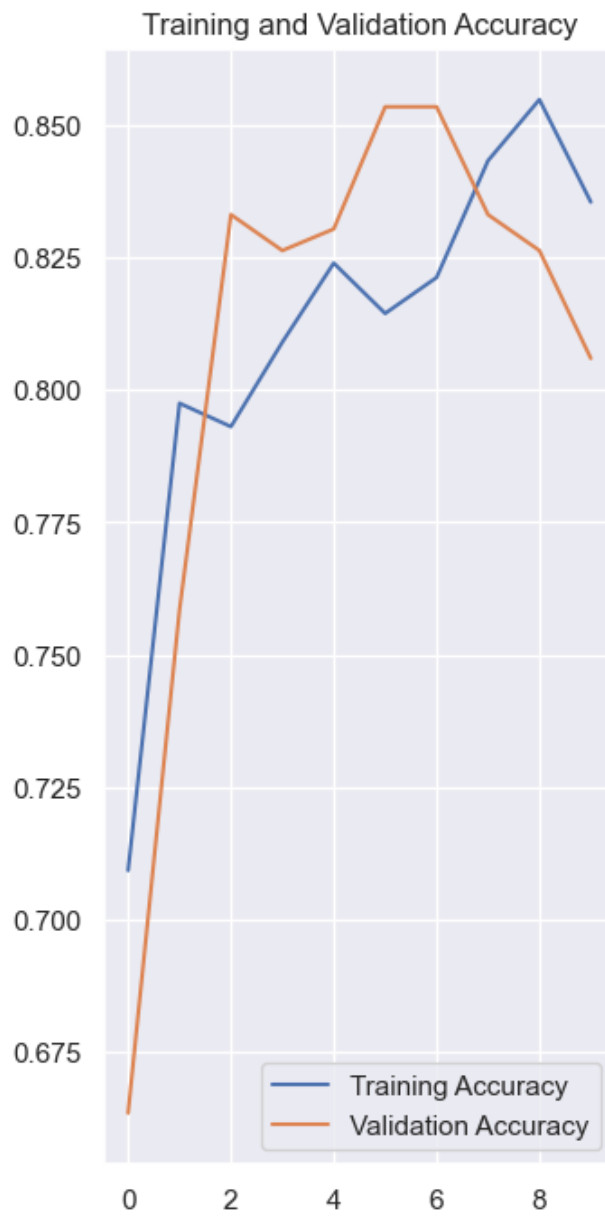
		Confusion Matrix							
Actual	bus	1	7	2	0	0	0	6	4
	crossover	5	58	0	1	2	38	6	10
	hatchback	13	42	0	2	3	26	4	15
	motorcycle	0	8	2	12	0	0	0	0
	pickup-truck	4	25	0	1	12	22	5	21
	sedan	60	180	2	2	24	46	7	75
	truck	4	26	3	0	1	1	25	5
	van	10	40	1	0	2	11	10	31
		bus	crossover	hatchback	motorcycle	pickup-truck	sedan	truck	van
		Predicted							

- It is not accepted model.

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### 3- inception\_v3



		Confusion Matrix							
Actual	bus	0	20	0	0	0	0	0	0
	crossover	0	120	0	0	0	0	0	0
	hatchback	0	105	0	0	0	0	0	0
	motorcycle	0	22	0	0	0	0	0	0
	pickup-truck	0	90	0	0	0	0	0	0
	sedan	0	396	0	0	0	0	0	0
	truck	0	65	0	0	0	0	0	0
	van	0	105	0	0	0	0	0	0
		bus	crossover	hatchback	motorcycle	pickup-truck	sedan	truck	van
		Predicted							

```
In [271]: print(classification_report(test_labels,pred_labels))
```

	precision	recall	f1-score	support
0	0.00	0.00	0.00	20
1	0.13	1.00	0.23	120
2	0.00	0.00	0.00	105
3	0.00	0.00	0.00	22
4	0.00	0.00	0.00	90
5	0.00	0.00	0.00	396
6	0.00	0.00	0.00	65
7	0.00	0.00	0.00	105
accuracy			0.13	923
macro avg	0.02	0.12	0.03	923
weighted avg	0.02	0.13	0.03	923