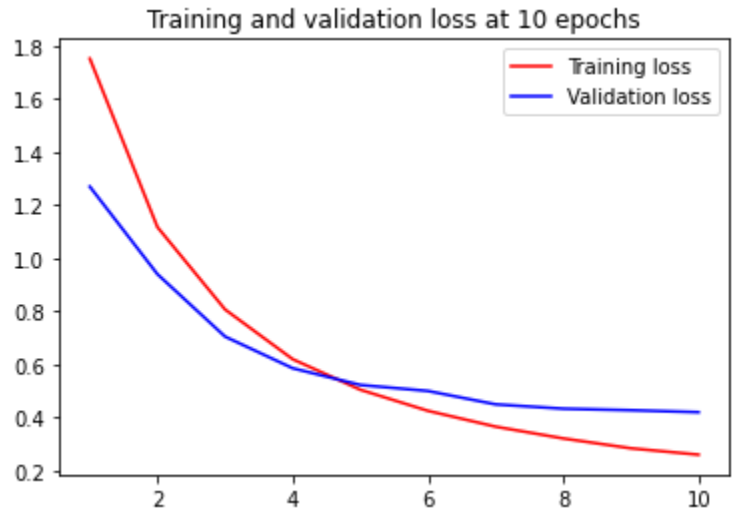
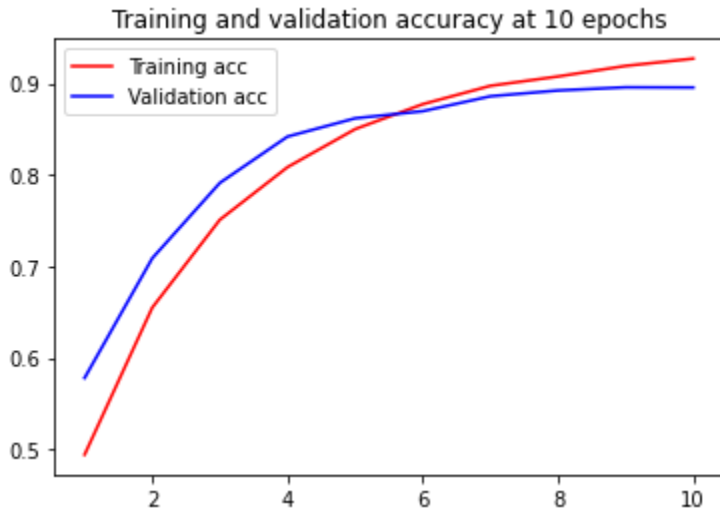


# Approach 1: LSTM



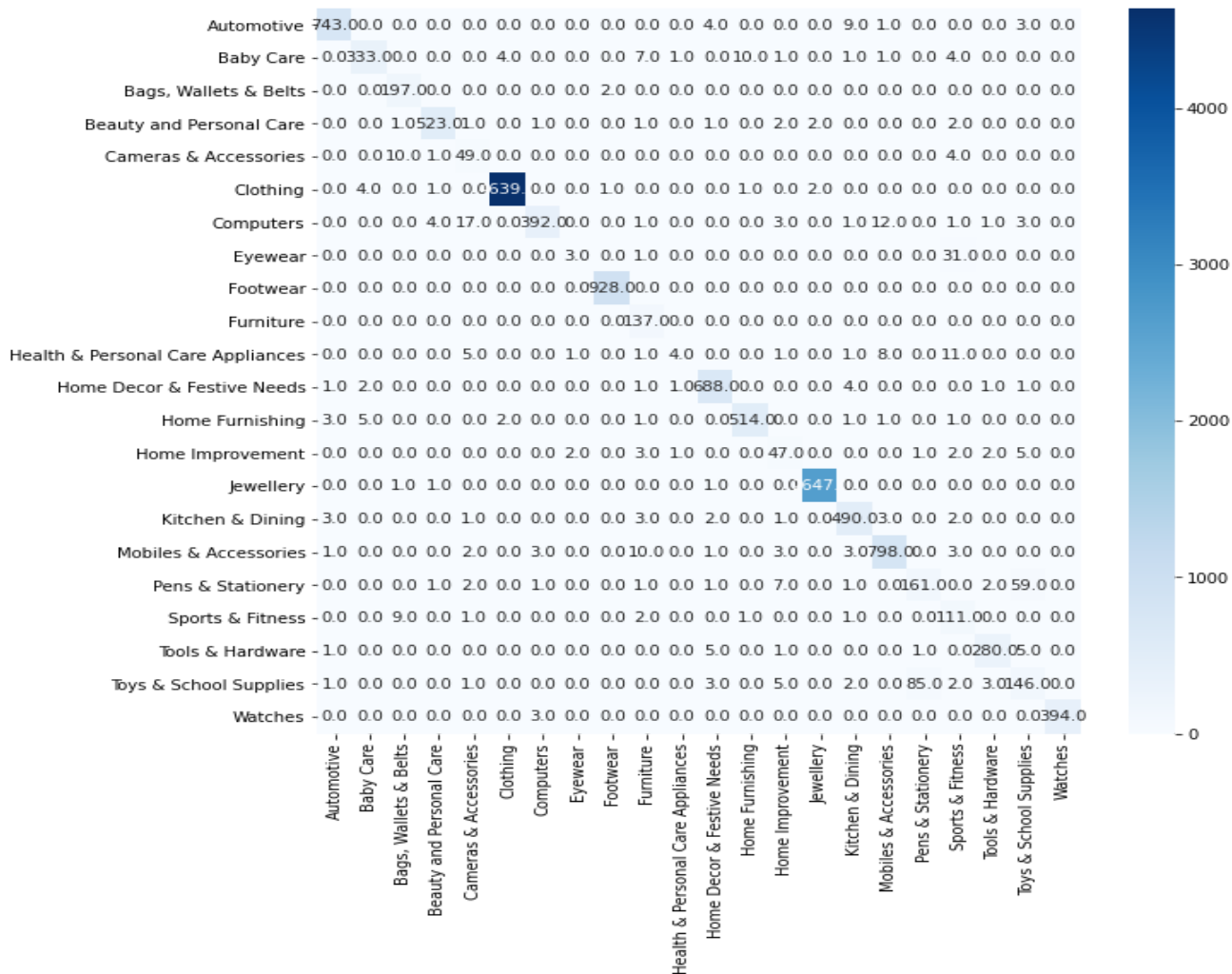
## 1.1 Training Classification Report

	precision	recall	f1-score	support
Automotive	0.99	0.98	0.98	760
Baby Care	0.97	0.92	0.94	362
Bags, Wallets & Belts	0.90	0.99	0.94	199
Beauty and Personal Care	0.98	0.98	0.98	534
Cameras & Accessories	0.62	0.77	0.69	64
Clothing	1.00	1.00	1.00	4648
Computers	0.98	0.90	0.94	435
Eyewear	0.50	0.09	0.15	35
Footwear	1.00	1.00	1.00	928
Furniture	0.81	1.00	0.90	137
Health & Personal Care Appliances	0.57	0.12	0.21	32
Home Decor & Festive Needs	0.97	0.98	0.98	699
Home Furnishing	0.98	0.97	0.98	528
Home Improvement	0.66	0.75	0.70	63
Jewellery	1.00	1.00	1.00	2650
Kitchen & Dining	0.95	0.97	0.96	505
Mobiles & Accessories	0.97	0.97	0.97	824
Pens & Stationery	0.65	0.68	0.67	236
Sports & Fitness	0.64	0.89	0.74	125
Tools & Hardware	0.97	0.96	0.96	293
Toys & School Supplies	0.66	0.59	0.62	248
Watches	1.00	0.99	1.00	397
accuracy			0.97	14702
macro avg	0.85	0.84	0.83	14702
weighted avg	0.97	0.97	0.97	14702

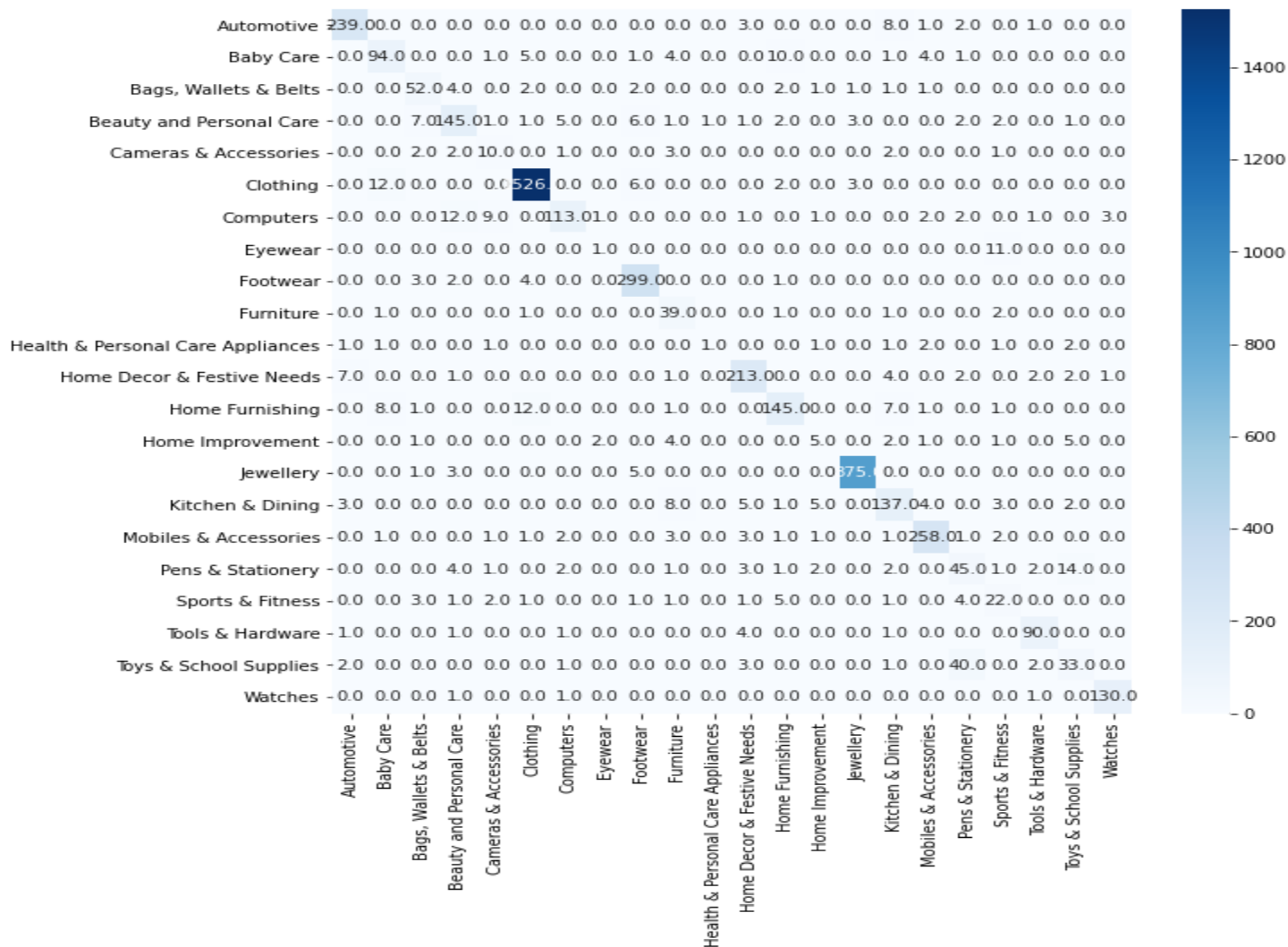
## 1.2 Validation classification report

	precision	recall	f1-score	support
Automotive	0.94	0.94	0.94	254
Baby Care	0.80	0.78	0.79	121
Bags, Wallets & Belts	0.74	0.79	0.76	66
Beauty and Personal Care	0.82	0.81	0.82	178
Cameras & Accessories	0.38	0.48	0.43	21
Clothing	0.98	0.99	0.98	1549
Computers	0.90	0.78	0.83	145
Eyewear	0.25	0.08	0.12	12
Footwear	0.93	0.97	0.95	309
Furniture	0.59	0.87	0.70	45
Health & Personal Care Appliances	0.50	0.09	0.15	11
Home Decor & Festive Needs	0.90	0.91	0.91	233
Home Furnishing	0.85	0.82	0.84	176
Home Improvement	0.31	0.24	0.27	21
Jewellery	0.99	0.99	0.99	884
Kitchen & Dining	0.81	0.82	0.81	168
Mobiles & Accessories	0.94	0.94	0.94	275
Pens & Stationery	0.45	0.58	0.51	78
Sports & Fitness	0.47	0.52	0.49	42
Tools & Hardware	0.91	0.92	0.91	98
Toys & School Supplies	0.56	0.40	0.47	82
Watches	0.97	0.98	0.97	133
accuracy			0.91	4901
macro avg	0.73	0.71	0.71	4901
weighted avg	0.91	0.91	0.91	4901

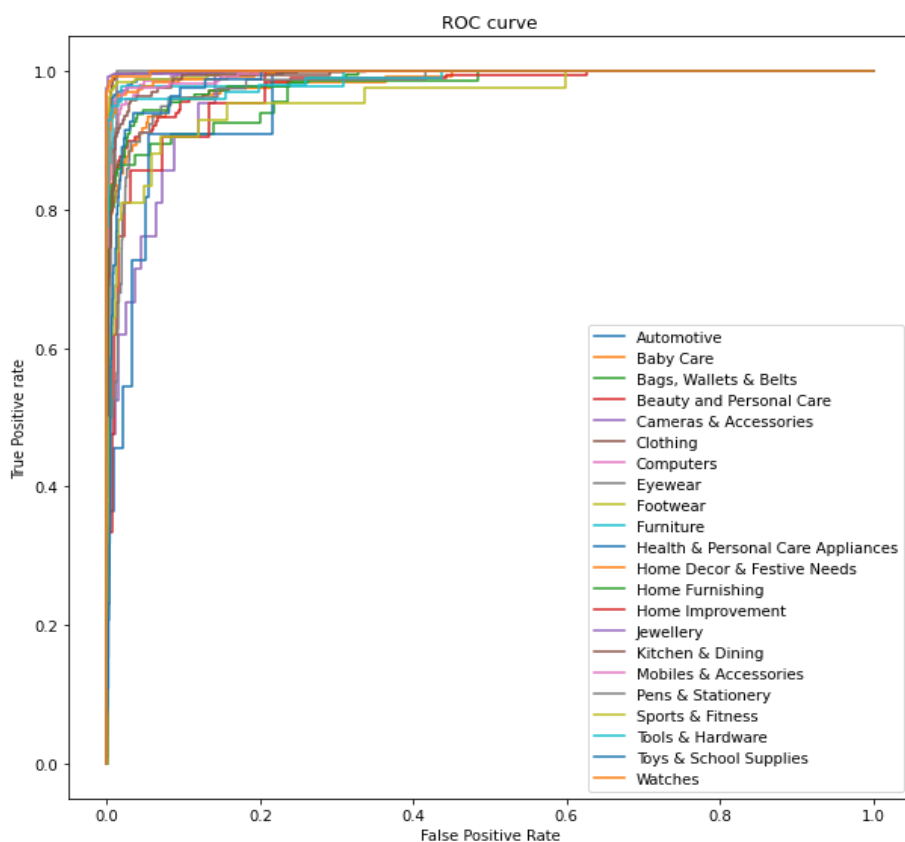
### 1.3 Training confusion matrix



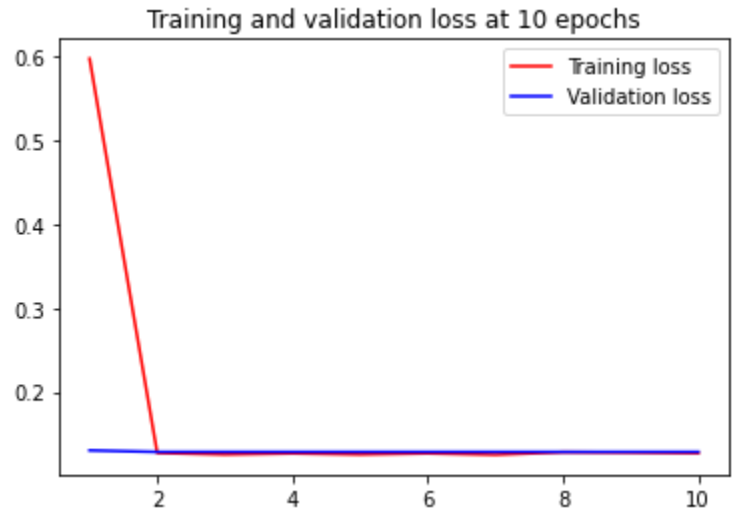
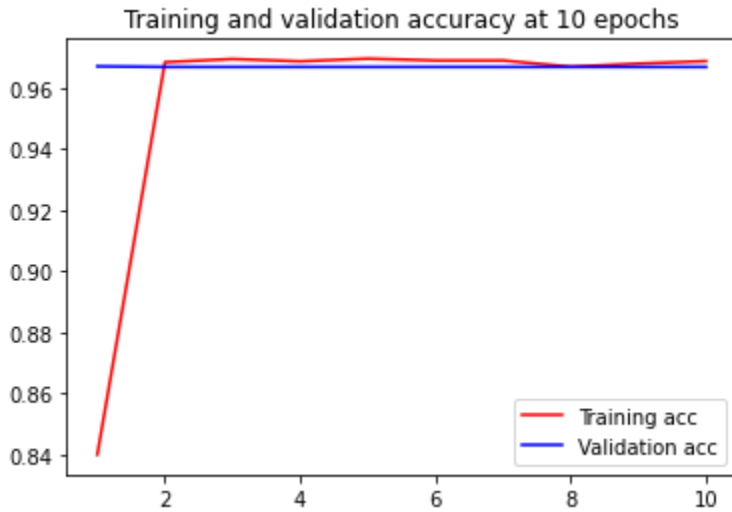
## 1.4 Validation confusion matrix



## 1.5 ROC Curve



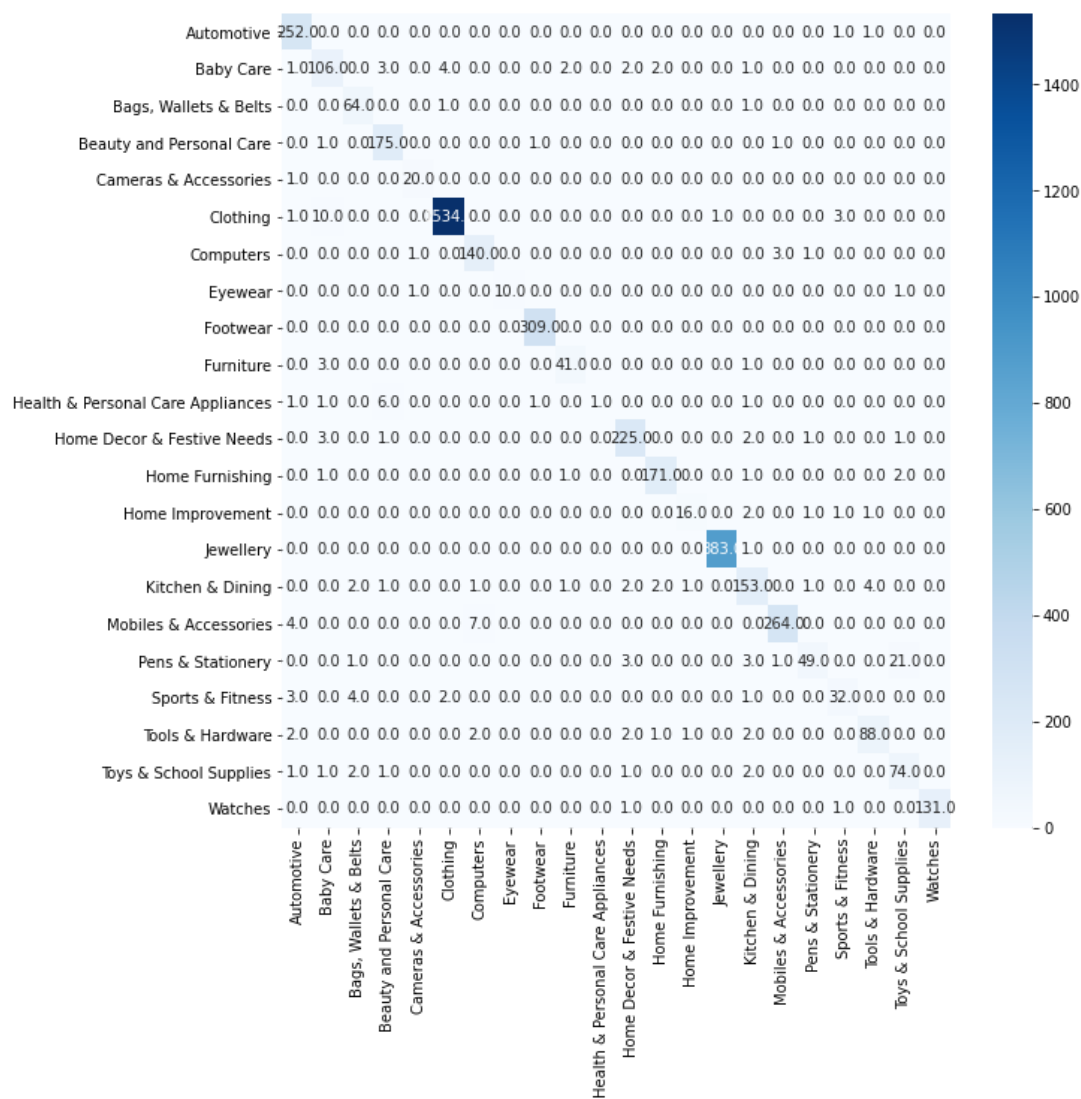
## Approach 2: BERT



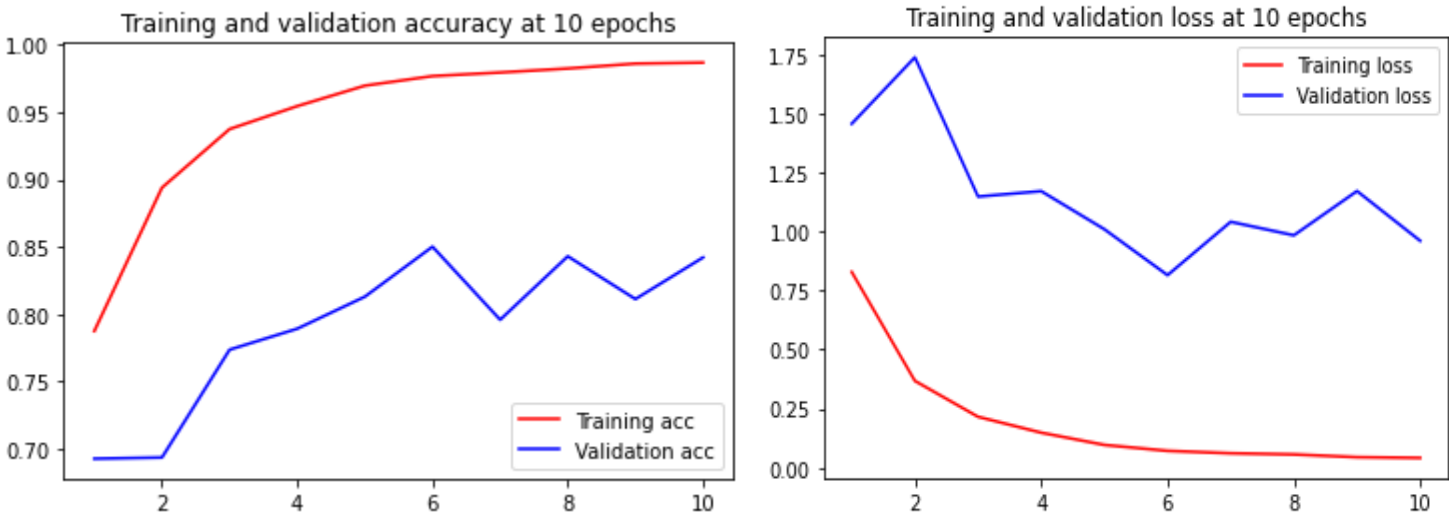
### 1.1 Validation classification report

	precision	recall	f1-score	support
Automotive	0.95	0.99	0.97	254
Baby Care	0.84	0.88	0.86	121
Bags, Wallets & Belts	0.88	0.97	0.92	66
Beauty and Personal Care	0.94	0.98	0.96	178
Cameras & Accessories	0.91	0.95	0.93	21
Clothing	1.00	0.99	0.99	1549
Computers	0.93	0.97	0.95	145
Eyewear	1.00	0.83	0.91	12
Footwear	0.99	1.00	1.00	309
Furniture	0.91	0.91	0.91	45
Health & Personal Care Appliances	1.00	0.09	0.17	11
Home Decor & Festive Needs	0.95	0.97	0.96	233
Home Furnishing	0.97	0.97	0.97	176
Home Improvement	0.89	0.76	0.82	21
Jewellery	1.00	1.00	1.00	884
Kitchen & Dining	0.89	0.91	0.90	168
Mobiles & Accessories	0.98	0.96	0.97	275
Pens & Stationery	0.92	0.63	0.75	78
Sports & Fitness	0.84	0.76	0.80	42
Tools & Hardware	0.94	0.90	0.92	98
Toys & School Supplies	0.75	0.90	0.82	82
Watches	1.00	0.98	0.99	133
accuracy			0.97	4901
macro avg	0.93	0.88	0.88	4901
weighted avg	0.97	0.97	0.97	4901

1.2 Validation confusion matrix



# Approach 3: Hybrid Model with Images



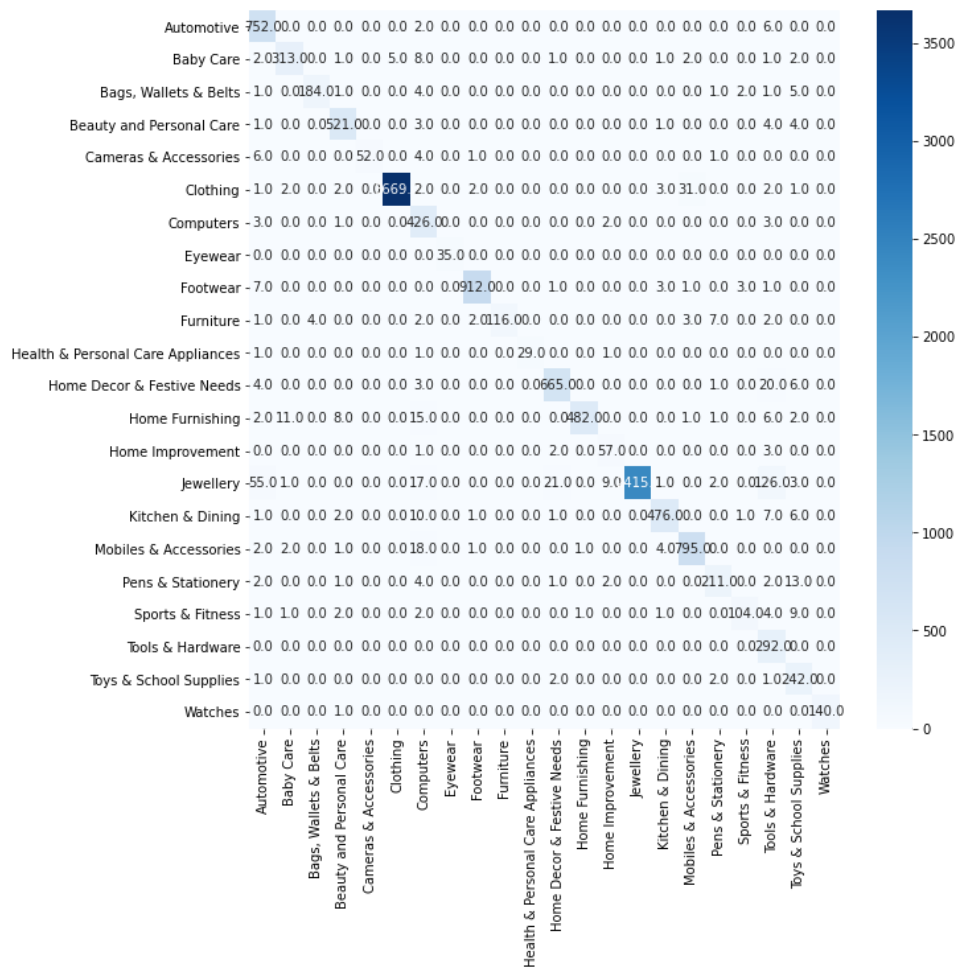
## 1.1 Training Classification Report

	precision	recall	f1-score	support
Automotive	0.89	0.99	0.94	760
Baby Care	0.95	0.93	0.94	336
Bags, Wallets & Belts	0.98	0.92	0.95	199
Beauty and Personal Care	0.96	0.98	0.97	534
Cameras & Accessories	1.00	0.81	0.90	64
Clothing	1.00	0.99	0.99	3715
Computers	0.82	0.98	0.89	435
Eyewear	1.00	1.00	1.00	35
Footwear	0.99	0.98	0.99	928
Furniture	1.00	0.85	0.92	137
Health & Personal Care Appliances	1.00	0.91	0.95	32
Home Decor & Festive Needs	0.96	0.95	0.95	699
Home Furnishing	1.00	0.91	0.95	528
Home Improvement	0.80	0.90	0.85	63
Jewellery	1.00	0.91	0.95	2650
Kitchen & Dining	0.97	0.94	0.96	505
Mobiles & Accessories	0.95	0.96	0.96	824
Pens & Stationery	0.93	0.89	0.91	236
Sports & Fitness	0.95	0.83	0.89	125
Tools & Hardware	0.61	1.00	0.76	292
Toys & School Supplies	0.83	0.98	0.89	248
Watches	1.00	0.99	1.00	141
accuracy			0.96	13486
macro avg	0.94	0.94	0.93	13486
weighted avg	0.96	0.96	0.96	13486

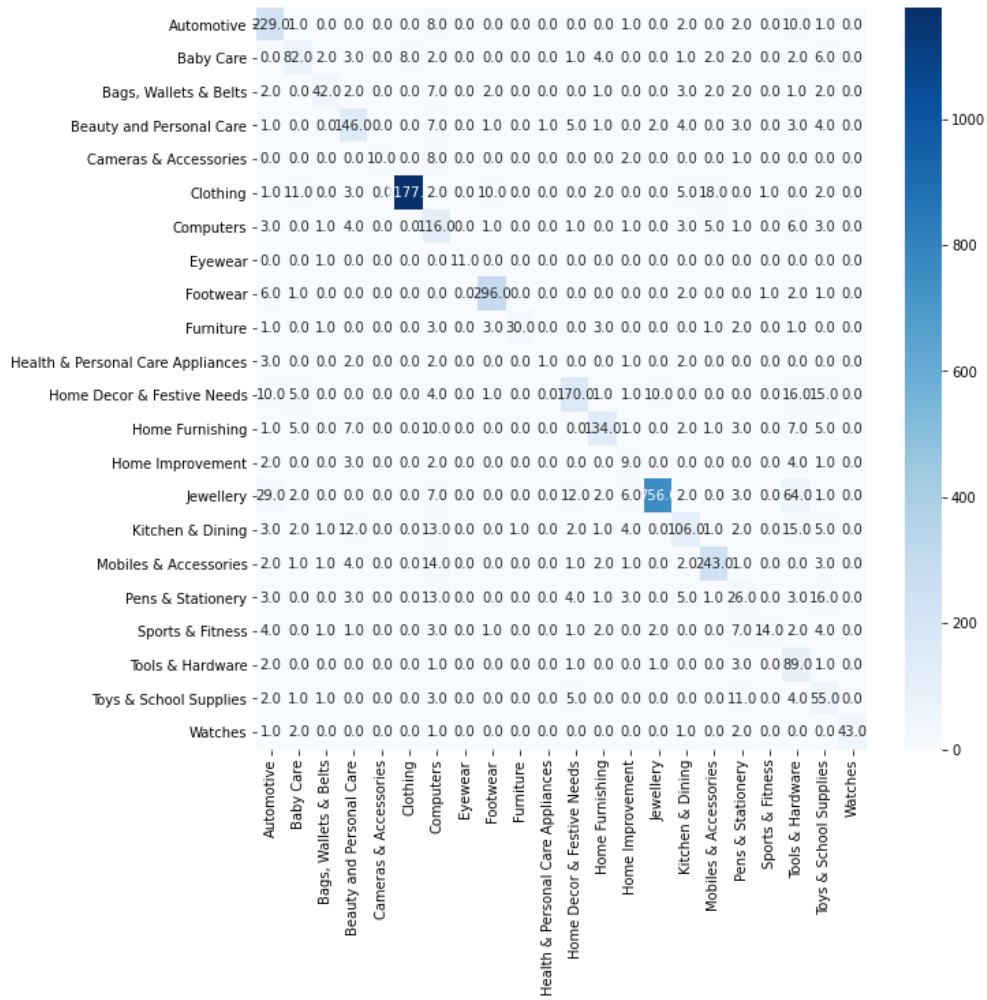
1.2 Validation classification report

	precision	recall	f1-score	support
Automotive	0.75	0.90	0.82	254
Baby Care	0.73	0.71	0.72	115
Bags, Wallets & Belts	0.82	0.64	0.72	66
Beauty and Personal Care	0.77	0.82	0.79	178
Cameras & Accessories	1.00	0.48	0.65	21
Clothing	0.99	0.96	0.97	1232
Computers	0.51	0.80	0.63	145
Eyewear	1.00	0.92	0.96	12
Footwear	0.94	0.96	0.95	309
Furniture	0.97	0.67	0.79	45
Health & Personal Care Appliances	0.50	0.09	0.15	11
Home Decor & Festive Needs	0.84	0.73	0.78	233
Home Furnishing	0.87	0.76	0.81	176
Home Improvement	0.30	0.43	0.35	21
Jewellery	0.98	0.86	0.91	884
Kitchen & Dining	0.76	0.63	0.69	168
Mobiles & Accessories	0.89	0.88	0.89	275
Pens & Stationery	0.37	0.33	0.35	78
Sports & Fitness	0.88	0.33	0.48	42
Tools & Hardware	0.39	0.91	0.54	98
Toys & School Supplies	0.44	0.67	0.53	82
Watches	1.00	0.86	0.92	50
accuracy			0.84	4495
macro avg	0.76	0.70	0.70	4495
weighted avg	0.87	0.84	0.85	4495

1.3 Training confusion matrix

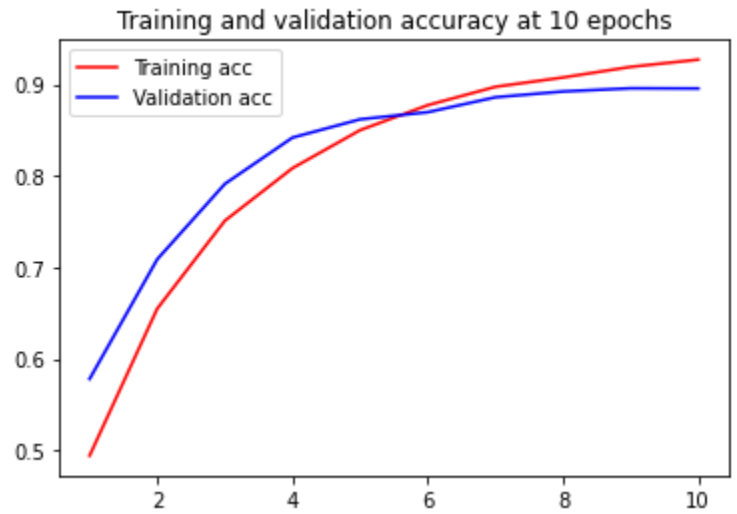
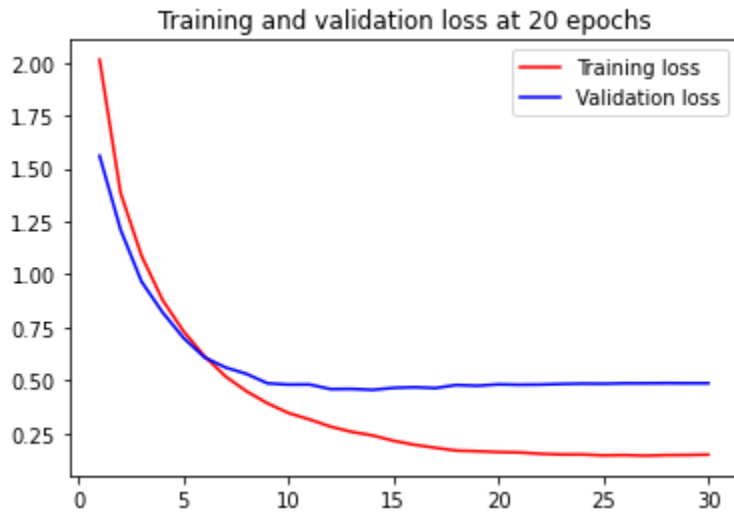


### 1.4 Validation confusion matrix





## Approach 5: CNN



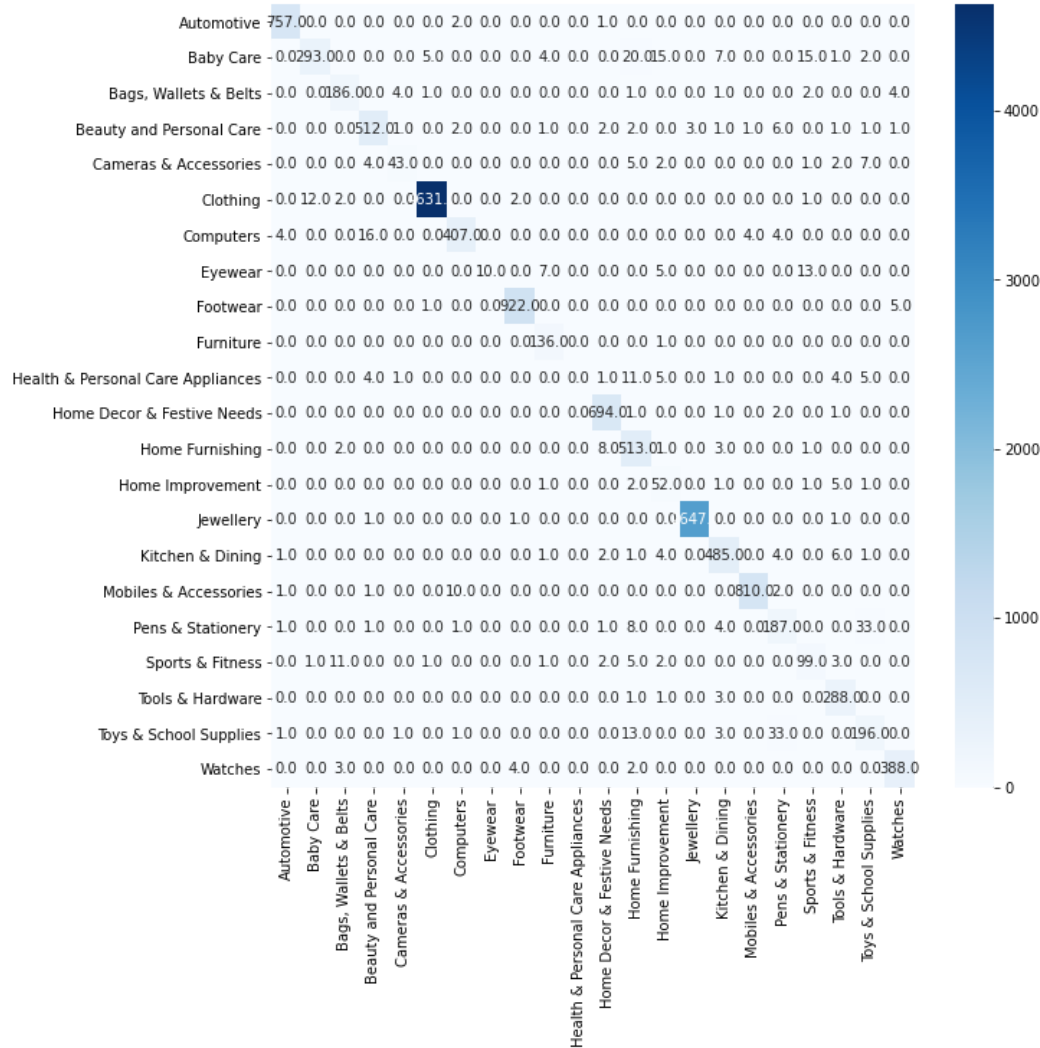
### 1.1 Training Classification Report

	precision	recall	f1-score	support
Automotive	0.99	1.00	0.99	760
Baby Care	0.96	0.81	0.88	362
Bags, Wallets & Belts	0.91	0.93	0.92	199
Beauty and Personal Care	0.95	0.96	0.95	534
Cameras & Accessories	0.86	0.67	0.75	64
Clothing	1.00	1.00	1.00	4648
Computers	0.96	0.94	0.95	435
Eyewear	1.00	0.29	0.44	35
Footwear	0.99	0.99	0.99	928
Furniture	0.90	0.99	0.94	137
Health & Personal Care Appliances	0.00	0.00	0.00	32
Home Decor & Festive Needs	0.98	0.99	0.98	699
Home Furnishing	0.88	0.97	0.92	528
Home Improvement	0.59	0.83	0.69	63
Jewellery	1.00	1.00	1.00	2650
Kitchen & Dining	0.95	0.96	0.96	505
Mobiles & Accessories	0.99	0.98	0.99	824
Pens & Stationery	0.79	0.79	0.79	236
Sports & Fitness	0.74	0.79	0.77	125
Tools & Hardware	0.92	0.98	0.95	293
Toys & School Supplies	0.80	0.79	0.79	248
Watches	0.97	0.98	0.98	397
accuracy			0.97	14702
macro avg	0.87	0.85	0.85	14702
weighted avg	0.97	0.97	0.97	14702

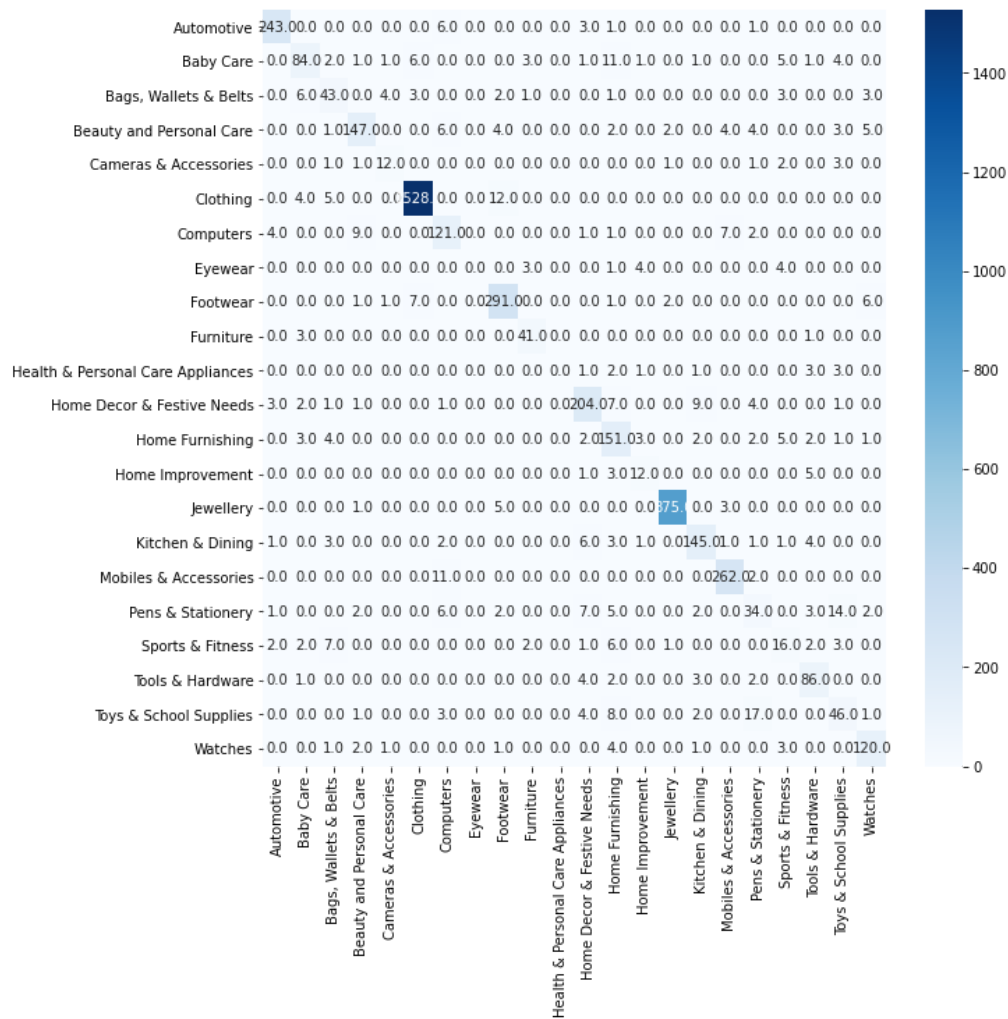
1.2 Validation classification report

	precision	recall	f1-score	support
Automotive	0.96	0.96	0.96	254
Baby Care	0.80	0.69	0.74	121
Bags, Wallets & Belts	0.63	0.65	0.64	66
Beauty and Personal Care	0.89	0.83	0.85	178
Cameras & Accessories	0.63	0.57	0.60	21
Clothing	0.99	0.99	0.99	1549
Computers	0.78	0.83	0.80	145
Eyewear	0.00	0.00	0.00	12
Footwear	0.92	0.94	0.93	309
Furniture	0.82	0.91	0.86	45
Health & Personal Care Appliances	0.00	0.00	0.00	11
Home Decor & Festive Needs	0.87	0.88	0.87	233
Home Furnishing	0.72	0.86	0.78	176
Home Improvement	0.55	0.57	0.56	21
Jewellery	0.99	0.99	0.99	884
Kitchen & Dining	0.87	0.86	0.87	168
Mobiles & Accessories	0.95	0.95	0.95	275
Pens & Stationery	0.49	0.44	0.46	78
Sports & Fitness	0.41	0.38	0.40	42
Tools & Hardware	0.80	0.88	0.84	98
Toys & School Supplies	0.59	0.56	0.57	82
Watches	0.87	0.90	0.89	133
accuracy			0.91	4901
macro avg	0.71	0.71	0.71	4901
weighted avg	0.91	0.91	0.91	4901

1.3 Training confusion matrix



1.4 Validation confusion matrix



1.5 ROC Curve

