

Python 3.11.5 | packaged by Anaconda, Inc. | (main, Sep 11 2023, 13:26:23) [MSC v.1916 64 bit (AMD64)]

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IPython 8.15.0 -- An enhanced Interactive Python.

Restarting kernel...

```
In [1]: 'C:/Users/rincy/Desktop/ML_IDS - RFC/Code/Feature Importance.py'
        = 'C:/Users/rincy/Desktop/ML_IDS - RFC/Code'
```

Shape of the dataset: (125973, 43)

Columns in the dataset: Index(['duration', 'protocol', 'service', 'flag', 'src_bytes', 'dst_bytes', 'land', 'wrong_fragment', 'urgent', 'hot', 'num_failed_logins', 'logged_in', 'num_compromised', 'root_shell', 'su_attempted', 'num_root', 'num_file_creations', 'num_shells', 'num_access_files', 'num_outbound_cmds', 'is_host_login', 'is_guest_login', 'count', 'srv_count', 'serror_rate', 'srv_serror_rate', 'rerror_rate', 'srv_rerror_rate', 'same_srv_rate', 'diff_srv_rate', 'srv_diff_host_rate', 'dst_host_count', 'dst_host_srv_count', 'dst_host_same_srv_rate', 'dst_host_diff_srv_rate', 'dst_host_same_src_port_rate', 'dst_host_srv_diff_host_rate', 'dst_host_serror_rate', 'dst_host_srv_serror_rate', 'dst_host_rerror_rate', 'dst_host_srv_rerror_rate', 'class', 'level'], dtype='object')

Class distribution:

class	
normal	67343
neptune	41214
satan	3633
ipsweep	3599
portsweep	2931
smurf	2646
nmap	1493
back	956
teardrop	892
warezclient	890
pod	201
guess_passwd	53
buffer_overflow	30
warezmaster	20
land	18
imap	11
rootkit	10
loadmodule	9
ftp_write	8
multihop	7
phf	4
perl	3
spy	2

Name: count, dtype: int64

Accuracy: 0.9985314546537011

Classification Report:

	precision	recall	f1-score	support
0	1.00	1.00	1.00	185
1	1.00	0.33	0.50	9
2	0.00	0.00	0.00	0
3	1.00	0.82	0.90	11
4	1.00	1.00	1.00	1
5	0.99	0.99	0.99	733
6	1.00	0.33	0.50	3
7	0.00	0.00	0.00	0
9	1.00	1.00	1.00	8228
10	0.99	0.99	0.99	313
11	1.00	1.00	1.00	13422
12	1.00	1.00	1.00	1
13	1.00	1.00	1.00	1
14	1.00	0.93	0.96	43
15	1.00	0.99	1.00	573
16	0.00	0.00	0.00	1
17	1.00	0.99	1.00	738
18	1.00	1.00	1.00	534
19	0.00	0.00	0.00	1
20	1.00	1.00	1.00	188
21	1.00	1.00	1.00	202
22	1.00	0.88	0.93	8
accuracy			1.00	25195
macro avg	0.82	0.74	0.76	25195
weighted avg	1.00	1.00	1.00	25195

[illegible]

0	0	0	0	2	0
0	0	0	0	0	0
Actual 4	0	0	0	0	1
0	0	0	0	0	0
0	0	0	0	0	0
Actual 5	0	0	0	0	0
729	0	0	0	4	0
0	0	0	0	0	0
Actual 6	0	0	0	0	0
1	0	0	0	1	0
0	0	1	0	0	0
0	0	0	0	0	0
Actual 7	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
Actual 8	0	0	0	0	0
0	0	8226	0	2	0
0	0	0	0	0	0
Actual 9	0	0	0	0	3
0	0	0	309	1	0
0	0	0	0	0	0
Actual 10	0	0	0	0	1
0	0	0	0	13420	0
0	0	0	0	1	0
Actual 11	0	0	0	0	0
0	0	0	0	0	1
0	0	0	0	0	0
Actual 12	0	0	0	0	0
0	0	0	0	0	0
1	0	0	0	0	0
0	0	0	0	0	0
Actual 13	0	0	0	0	0
0	0	0	0	3	0
0	40	0	0	0	0
0	0	0	0	0	0
Actual 14	0	0	0	0	0
0	0	0	0	3	0
0	0	570	0	0	0
0	0	0	0	0	0
Actual 15	0	0	0	0	0
0	0	0	0	1	0
0	0	0	0	0	0
0	0	0	0	0	0
Actual 16	0	0	0	0	1
0	0	0	0	3	0
0	0	1	0	733	0
0	0	0	0	0	0

Actual 17	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	534	0
Actual 18	0	0	0	0	0	0
0	0	0	0	0	1	0
0	0	0	0	0	0	0
Actual 19	0	0	0	0	0	0
0	0	0	0	0	0	0
0	188	0	0	0	0	0
Actual 20	0	0	0	0	0	0
0	0	0	0	0	1	0
0	0	201	0	0	0	0
Actual 21	0	0	0	0	0	0
0	0	0	0	0	1	0
0	0	0	7	0	0	0

```

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```

C:\Users\rincy\anaconda3\Lib\site-packages\sklearn\metrics_classification.py:1509:

UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero_division` parameter to control this behavior.

_warn_prf(average, modifier, f"{metric.capitalize()} is", len(result))

C:\Users\rincy\anaconda3\Lib\site-packages\sklearn\metrics_classification.py:1509:

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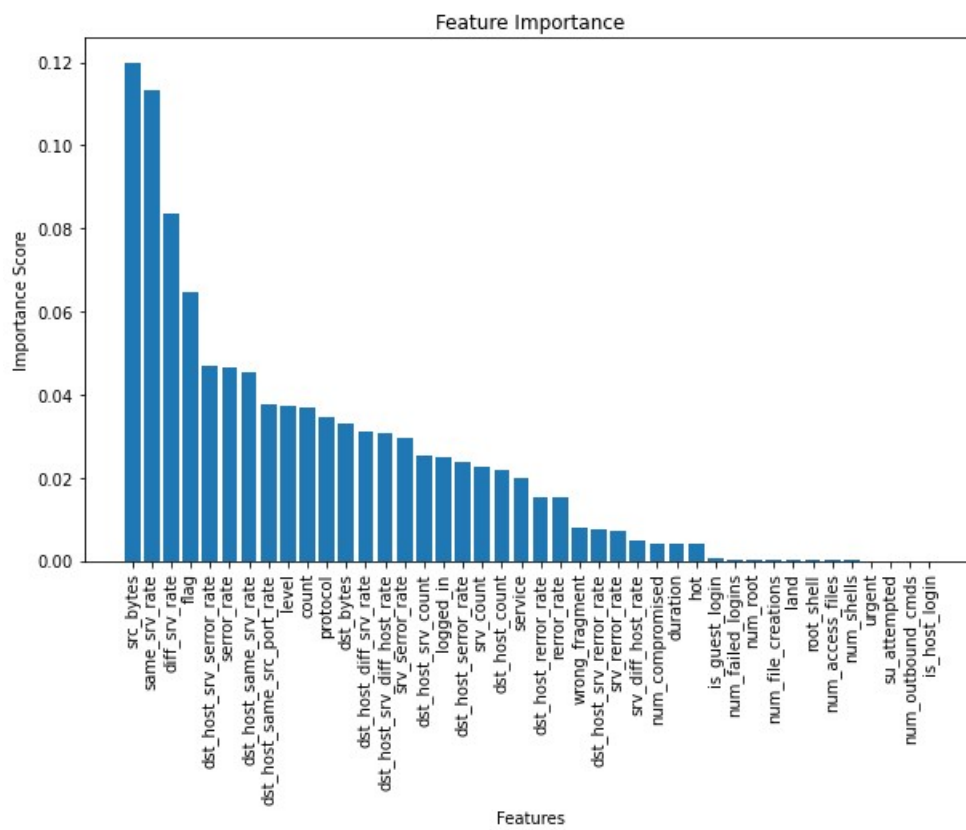
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In [2]: