```
Type "copyright", "credits" or "license" for more information.
IPython 8.15.0 -- An enhanced Interactive Python.
Restarting kernel...
                'C:/Users/rincy/Desktop/ML IDS - RFC/Code/Feature Importance.py'
In [1]:
    ='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
                   41214
neptune
                    3633
satan
ipsweep
                    3599
portsweep
                    2931
smurf
                    2646
nmap
                    1493
                     956
back
teardrop
                     892
                     890
warezclient
                     201
pod
guess passwd
                      53
buffer_overflow
                      30
warezmaster
                      20
land
                      18
imap
                      11
rootkit
                      10
                       9
loadmodule
                       8
ftp write
multihop
                       7
                       4
phf
                       3
perl
spy
Name: count, dtype: int64
Accuracy: 0.9985314546537011
Classification Report:
```

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

bit (AMD64)]

	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

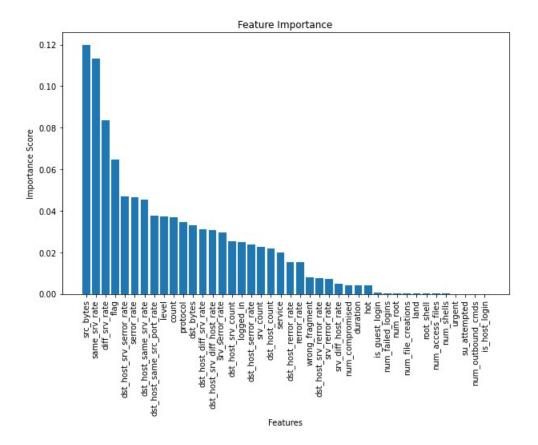
Confusion Matrix:

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Predicted 5 Predicted 6 Predicted 7 Predicted 8 Predicted 9 Predicted 10																
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Predicted 11 Predicted 12 Predicted 13 Predicted 14 Predicted 15 Predicted 16 Predicted 17 Predicted 18 Predicted 19 Predicted 20 Predicted 21																
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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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```

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



In [2]: