Network dataset lab 19 04

April 19, 2023

```
[]: import numpy as np
     import pandas as pd
     import seaborn as sn
     import matplotlib.pyplot as plt
     pd.set option("display.max.columns", None)
     pd.set_option("display.precision", 4)
[]: # Klasy (w kolumnie Label): 0 - normal data (68424), 1 - attack data
     df1 = pd.read_csv(r'.\Normal_data_with_ddos.csv') # 48413 DDoS data
[]: df1
[]:
                                               Flow ID
                                                                 Src IP
                                                                         Src Port \
     0
                                                          185.127.17.56
             185.127.17.56-192.168.20.133-443-53648-6
                                                                              443
     1
             185.127.17.56-192.168.20.133-443-53650-6
                                                         192.168.20.133
                                                                            53650
               192.168.20.133-192.168.20.2-35108-53-6
                                                         192.168.20.133
                                                                            35108
     3
               192.168.20.133-192.168.20.2-35108-53-6
                                                           192.168.20.2
                                                                               53
             154.59.122.74-192.168.20.133-443-60900-6
                                                         192.168.20.133
                                                                            60900
     116832
                  192.168.20.134-199.128.37.150-0-0-0
                                                         199.128.37.150
                                                                                0
     116833
                   192.168.20.134-204.43.184.74-0-0-0
                                                          204.43.184.74
                   192.168.20.134-83.216.215.83-0-0-0
                                                                                0
     116834
                                                          83.216.215.83
     116835
                                 8.0.6.4-8.6.0.1-0-0-0
                                                                8.6.0.1
     116836
                              137.66.2.7-4.0.0.0-0-0-0
                                                             137.66.2.7
                     Dst IP
                             Dst Port Protocol
                                                                Timestamp
     0
             192.168.20.133
                                 53648
                                               6
                                                           5/2/2020 13:58
     1
              185.127.17.56
                                               6
                                                           5/2/2020 13:58
                                   443
     2
                                               6
                                                           5/2/2020 13:58
               192.168.20.2
                                    53
     3
             192.168.20.133
                                 35108
                                                           5/2/2020 13:58
              154.59.122.74
                                   443
                                               6
                                                           5/2/2020 13:58
     116832
             192.168.20.134
                                     0
                                               0
                                                           4/2/2020 15:20
     116833
             192.168.20.134
                                     0
                                               0
                                                           4/2/2020 15:20
             192.168.20.134
                                     0
                                               0
                                                           4/2/2020 15:20
     116834
     116835
                    8.0.6.4
                                     0
                                                  31/12/2019 06:14:05 PM
                    4.0.0.0
                                     0
                                                  31/12/2019 06:14:01 PM
     116836
```

	Flow Duration T	ot Fwd Pkts T	ot Bwd Pkts	TotLen	Fwd Pkts	\	
0	245230	44	40		124937		
1	1605449	107	149		1071		
2	53078	5	5		66		
3	6975	1	1		0		
4	190141	13	16		780		
•••	•••	•••					
116832	2	0	2		0		
116833	2	0	2		0		
116834	2	0	2		0		
116835	64815031	910748	1		0		
116836	70611188	19	1		0		
	TotLen Bwd Pkts	Fwd Pkt Len M	lax Fwd Pkt	Len Min	Fwd Pkt	Len Mean	\
0	1071	91	.00	0	2	2839.4773	
1	439537	5	517	0		10.0093	
2	758		66	0		13.2000	
3	0		0	0		0.0000	
4	11085	4	27	0		60.0000	
•••	•••	•••	•••		•••		
116832	0		0	0		0.0000	
116833	0		0	0		0.0000	
116834	0		0	0		0.0000	
116835	0		0	0		0.0000	
116836	0		0	0		0.0000	
	Fwd Pkt Len Std	Bwd Pkt Len M	lax Bwd Pkt	Len Min	Bwd Pkt	Len Mean	\
0	1839.5083		517	0	Dwa 1110	26.7750	`
1	67.4967	273		0		2949.9128	
2	29.5161		38	0	-	151.6000	
3	0.0000	· ·	0	0		0.0000	
4	130.0429	25	596	0		692.8125	
-					•••	002.0120	
116832	0.0000		0	0		0.0000	
116833	0.0000		0	0		0.0000	
116834	0.0000		0	0		0.0000	
116835	0.0000		0	0		0.0000	
116836	0.0000		0	0		0.0000	
				·			
	Bwd Pkt Len Std	Flow Byts/s	Flow Pkts/	s Flow I	IAT Mean	\	
0	109.1880	513835.9907	342.535	6 2.9	9546e+03		
1	3012.5895	274445.3421	159.456		2959e+03		
2	276.8263	15524.3227	188.402		3976e+03		
3	0.0000	0.0000	286.738		9750e+03		
4	794.1573	62401.0603	152.518		7908e+03		
•••	•••	•••	•••	•••			

116832	0.00		0000	1000000.				
116833	0.00		0000	1000000.				
116834	0.00		0000	1000000.		2.0000		
116835	0.00		0000	14051.		7.1167		
116836	0.00	000 0.	0000	0.	2832	3.7164	e+06	
	Flow IAT Std	Flow IAT M	ax F	low IAT M	lin :	Fwd IAT Tot	Fwd IAT Me	an \
0	7.9532e+03	640	66	=	-44	238564	5.5480e+	03
1	5.6408e+04	8597	60	-1	.02	1332121	1.2567e+	04
2	1.5185e+04	462	32		19	50302	1.2576e+	04
3	0.0000e+00	69	75	69	975	0	0.0000e+	00
4	1.2933e+04	385	21	-	-54	86882	7.2402e+	03
 116832	 0.0000e+00	•••	2	•••	2	 0	 0.0000e+	00
116833	0.0000e+00		2		2	0	0.0000e+	
116834	0.0000e+00		2		2	0	0.0000e+	
116835	4.0770e+03	23993		_	-30	64700000	7.1067e+	
116836	2.2419e+06	111000		12277		67500000	3.7507e+	
	T1 TAT C+1	C 3 TAT M	F 4	TAT M:	D 1	TAT T-+ D	1 TAT M	`
^		Fwd IAT Max		IAT Min	Bwa		wd IAT Mean	\
0	1.0446e+04	64066		2		245230	6287.9487	
1	8.3434e+04	861138		2		1603130	10831.9595	
2	2.2522e+04	46251		67		52962	13240.5000	
3	0.0000e+00	2000		0		0	0.0000	
4	1.3051e+04	38805		1		190141	12676.0667	
 116832	0.0000e+00		•••	0	•••	2	2.0000	
116833	0.0000e+00	0		0		2	2.0000	
116834	0.0000e+00	0		0		2	2.0000	
116835	4.0759e+03	2399309		-30		0	0.0000	
116836	2.3018e+06	11100000		1227799		0	0.0000	
110000	2.00100.00	1110000		1221100		V	0.0000	
_		Bwd IAT Max			Fwd		Bwd PSH Fla	_
0	12986.4688	79070		29		0		0
1	73926.6524	861129		1		0		0
2	22052.0441	46258		405		0		0
3	0.0000	0		0		0		0
4	15949.0928	38521		1		0		0
•••	•••	•••	•••		•••		•••	
116832	0.0000	2		2		0		0
116833	0.0000	2		2		0		0
116834	0.0000	2		2		0		0
116835	0.0000	0		0		0		0
116836	0.0000	0		0		0		0
	Fwd URG Flags	s Bwd URG F	lags	Fwd Head	ler L	en Bwd Hea	der Len \	
0	C		0			80	804	

1		0	0		214	ŧ0	3004	1	
2		0	0		10		124		
3		0	0		2	20	20)	
4		0	0		26	80	344	1	
•••	•••	•••		•••		•••			
116832		0	0			0	()	
116833		0	0			0	()	
116834		0	0			0	()	
116835		0	0			0	()	
116836		0	0			0	()	
	Fwd Pkts/s	Bwd Pkts/s	Dlr+	Ion Min	Dl++	Ion Mow	Dlr+ I on	Mean \	
0	179.4234	163.1122	PKU.	0	PKU	9100		меан (.4471	
1	66.6480	92.8089		0		27300		.4280	
2	94.2010	94.2010		0		638		. 4200	
3	143.3692	143.3692		0		0		.0000	
4	68.3703	84.1481		0		2596		.5000	
-		04.1401		O		2090		. 5000	
116832		1000000.0000		0		0		.0000	
116833		1000000.0000		0		0		.0000	
116834		1000000.0000		0		0		.0000	
116835		0.0154		0		0		.0000	
116836	0.2691	0.0142		0		0		.0000	
	Pkt Len Std	Pkt Len Var	FIN	Flag Cnt	SYN	I Flag Cn	t RST F	lag Cnt	\
0	1933.2683	3.7375e+06		0			1	0	
1	2713.4659	7.3629e+06		0			1	0	
2	190.8075	3.6407e+04		0			1	0	
3	0.0000	0.0000e+00		0			0	0	
4	661.6917	4.3784e+05		0			1	0	
•••	•••	•••	•••		•••		•••		
116832	0.0000	0.0000e+00		0			0	0	
116833	0.0000	0.0000e+00		0			0	0	
116834	0.0000	0.0000e+00		0			0	0	
116835	0.0000	0.0000e+00		0			0	0	
116836	0.0000	0.0000e+00		0			0	0	
	PSH Flag Cnt	ACK Flag Cn	t IJR	G Flag Cı	nt O	CWE Flag	Count \		
0	00		1		0	=6	0		
1	O)	0		0		0		
2	O		0		0		0		
3	O)	1		0		0		
4	C)	0		0		0		
•••	***	•••		•••					
116832	O)	0		0		0		
116833	0)	0		0		0		
116834	O)	0		0		0		

116835	0	0 0	0	
116836	0	0 0	0	
		D D1 . G	T 1 G G: A)	
^	-	Ratio Pkt Size Avg		
0	0	0 1500.0952		
1	0	1 1721.1250		
2	0	1 82.4000		
3	0	1 0.0000		
4	0	1 409.1379	60.0000	
 116020				
116832	0	0.0000		
116833	0	0.0000		
116834	0	0 0.0000		
116835	0	0 0.0000		
116836	0	0 0.0000	0.0000	
	Rud Cog Sizo Aug Euc	N Buta/h Aug End Dirt	s/b Avg Fwd Blk Rate Avg '	\
0	26.7750	O O O O O O O O O O O O O O O O O O O	0 0	`
1	2949.9128	0	0 0	
2	151.6000	0	0 0	
3	0.0000	0	0 0	
4	692.8125	0		
4	092.0125	U	0 0	
 116832	0.0000	0	0 0	
116833	0.0000	0	0 0	
116834	0.0000	0	0 0	
116835	0.0000	0	0 0	
116836	0.0000	0	0 0	
110030	0.0000	U	0	
	Bud Byts/h Avg Bud F	Pkts/h Avor Rwd Rlk R	ate Avg Subflow Fwd Pkts '	\
0	Dwa bytto, b Avg bwa i	0	0 44	`
1	0	0	0 107	
2	0	0	0 5	
3	0	0	0 1	
4	0	0	0 13	
	V			
 116832	 O	0	0 0	
116833	0	0	0 0	
116834	0	0	0 0	
116835	0	0	0 910748	
116836	0	0	0 910748	
110000	V	V	· 19	
	Subflow Fwd Byts Sub	oflow Bwd Pkts Subfl	ow Bwd Byts \	
0	124937	40	1071	
1	1071	149	439537	
2	66	5	758	
3	0	1	0	
-	•	-	-	

```
4
                      780
                                          16
                                                          11085
                                           2
116832
                        0
                                                              0
                                           2
                                                              0
116833
                        0
116834
                        0
                                           2
                                                              0
                        0
116835
                                           1
                                                              0
                        0
                                           1
                                                              0
116836
                            Init Bwd Win Byts Fwd Act Data Pkts
        Init Fwd Win Byts
0
                        -1
                                         65535
1
                        -1
                                         64240
                                                                 4
2
                        -1
                                         64240
                                                                 1
3
                        -1
                                         64239
                                                                 0
4
                        -1
                                         64240
                                                                  3
116832
                        -1
                                            -1
                                                                 0
                        -1
                                            -1
                                                                 0
116833
                        -1
                                            -1
                                                                 0
116834
                                                                  0
116835
                        -1
                                            -1
116836
                        -1
                                            -1
        Fwd Seg Size Min Active Mean Active Std Active Max Active Min \
0
                            0.0000e+00 0.0000e+00
                                                               0
                                                                            0
1
                                                                            0
                        0
                            0.0000e+00 0.0000e+00
                                                               0
2
                        0
                            0.0000e+00
                                         0.0000e+00
                                                               0
                                                                            0
3
                        0
                            0.0000e+00
                                         0.0000e+00
                                                               0
                                                                            0
                            0.0000e+00
4
                                         0.0000e+00
                                                                            0
                               •••
116832
                        0
                            0.0000e+00
                                         0.0000e+00
                                                               0
                                                                            0
                        0
                            0.0000e+00
                                         0.0000e+00
                                                               0
                                                                            0
116833
                        0
                            0.0000e+00
                                         0.0000e+00
                                                               0
                                                                            0
116834
                        0
                                                                            0
116835
                            0.0000e+00
                                         0.0000e+00
                                                               0
116836
                            5.6393e+06
                                         6.0924e+06
                                                        12600000
                                                                      1227799
        Idle Mean
                      Idle Std
                                Idle Max
                                           Idle Min Label
0
              0.0 0.0000e+00
                                                   0
                                                          0
1
              0.0 0.0000e+00
                                        0
                                                   0
                                                          0
2
              0.0 0.0000e+00
                                        0
                                                   0
                                                          0
3
              0.0 0.0000e+00
                                        0
                                                   0
                                                          0
4
              0.0
                   0.0000e+00
                                        0
                                                   0
                                                          0
116832
              0.0 0.0000e+00
                                        0
                                                   0
                                                          1
116833
              0.0 0.0000e+00
                                        0
                                                   0
                                                          1
              0.0 0.0000e+00
116834
                                        0
                                                   0
                                                          1
              0.0 0.0000e+00
                                        0
                                                   0
                                                          1
116835
116836 6750987.0 2.9197e+06 11100000
                                            5103137
                                                          1
```

[]: df1.describe()

[]:		Src Port	Dst Port	Proto	col Flo	w Duration	n Tot Fwd Pk	ts \
	count		116837.0000			1.1684e+0		
	mean	21879.9805	5700.4316	6.6	874	7.9813e+06	3 14.71	.00
	std	24087.3536	15566.5742	7.0	494	2.6577e+07	7 2665.83	47
	min	0.0000	0.0000	0.0	000 -	1.5400e+02	0.00	00
	25%	0.0000	0.0000	0.0	000	2.0000e+00	0.00	00
	50%	443.0000	53.0000	6.0	000	2.4400e+03	3 1.00	00
	75%	46051.0000	443.0000	17.0	000	8.3240e+03	1.00	00
	max	65513.0000	60998.0000	17.0	000	1.2000e+08	910748.00	00
		Tot Bwd Pkts	TotLen Fwd	l Pkts Tot	Len Bwd 1	Pkts Fwd	Pkt Len Max	\
	count	116837.0000	1.168	4e+05	1.1684	e+05	116837.0000	
	mean	11.7173	1.964	:5e+03	2.4176	e+04	249.4013	
	std	180.7494	1.194	7e+05	5.8808	e+05	1110.8013	
	min	1.0000	0.000	0e+00	0.0000	e+00	0.0000	
	25%	2.0000	0.000	0e+00	0.0000	e+00	0.0000	
	50%	2.0000	0.000	0e+00	0.0000	e+00	0.0000	
	75%	3.0000	4.200	0e+01	6.2200	e+02	42.0000	
	max	34094.0000	3.160	0e+07	1.0700	e+08	64239.0000	
		Fwd Pkt Len M	lin Fwd Pkt	Len Mean	Fwd Pkt	Len Std	Bwd Pkt Len	Max \
	count	116837.00	000 11	6837.0000	116	837.0000	116837.0	000
	mean	13.05	582	89.5535		94.6916	936.0	695
	std	52.60	70	448.3130		555.5502	4830.3	437
	min	0.00	000	0.0000		0.0000	0.0	000
	25%	0.00		0.0000		0.0000	0.0	
	50%	0.00		0.0000		0.0000		000
	75%	30.00	000	36.0000		0.0000	345.0	000
	max	3900.00	000 3	2119.5000	45	423.8325	64239.0	000
		Bwd Pkt Len M		Len Mean			Flow Byts/s	\
	count	116837.00		.6837.0000		837.0000	1.1684e+05	
	mean	15.22		193.1011		224.0320	1.9508e+05	
	std	34.23		575.7508	;	817.4183	1.1239e+06	
	min	0.00		0.0000		0.0000	-2.6271e+05	
	25%	0.00		0.0000		0.0000	0.0000e+00	
	50%	0.00		0.0000		0.0000	4.1564e+00	
	75%	31.00		186.3333		167.3091	1.1896e+05	
	max	761.00	000 2	2660.7227	32	119.5000	8.6300e+07	
		Flow Pkts/s	Flow IAT Me	an Flow I	AT Std	Flow IAT N	Max Flow IAT	'Min \
	count	1.1684e+05	1.1684e+		84e+05	1.1684e-		
	mean	6.3526e+05	3.1627e+		08e+05	3.1797e-		

```
8.3569e+05
                        1.4636e+06
                                       3.2238e+06
                                                                     7.3446e+05
std
                                                      1.1415e+07
                                       0.0000e+00
min
       -1.6949e+04
                       -1.5400e+02
                                                     -1.5400e+02
                                                                    -1.1570e+04
25%
        5.0441e+02
                        2.0000e+00
                                       0.0000e+00
                                                      2.0000e+00
                                                                     1.0000e+00
50%
        1.4493e+03
                        9.5367e+02
                                       0.0000e+00
                                                      1.9680e+03
                                                                     3.0000e+00
75%
        1.0000e+06
                        3.1470e+03
                                       2.6495e+03
                                                      6.8360e+03
                                                                     7.1000e+01
        3.0000e+06
                        1.1900e+08
                                       6.2400e+07
                                                      1.1900e+08
                                                                     1.1900e+08
max
       Fwd IAT Tot
                     Fwd IAT Mean
                                    Fwd IAT Std
                                                  Fwd IAT Max
                                                               Fwd IAT Min
        1.1684e+05
                       1.1684e+05
                                     1.1684e+05
                                                   1.1684e+05
                                                                 1.1684e+05
count
mean
        7.6600e+06
                       6.7630e+05
                                     1.1064e+06
                                                   3.0362e+06
                                                                 5.4238e+04
std
        2.6316e+07
                       3.1671e+06
                                     4.6894e+06
                                                   1.1294e+07
                                                                 1.1689e+06
        0.0000e+00
                       0.0000e+00
                                     0.0000e+00
                                                   0.0000e+00
                                                                -3.0000e+01
min
25%
        0.0000e+00
                       0.0000e+00
                                     0.0000e+00
                                                   0.0000e+00
                                                                 0.0000e+00
50%
        0.0000e+00
                       0.0000e+00
                                     0.0000e+00
                                                   0.0000e+00
                                                                 0.0000e+00
75%
        0.0000e+00
                       0.0000e+00
                                     0.0000e+00
                                                   0.0000e+00
                                                                 0.0000e+00
max
        1.2000e+08
                       1.1800e+08
                                     8.4400e+07
                                                   1.1900e+08
                                                                 1.1800e+08
       Bwd IAT Tot
                     Bwd IAT Mean
                                    Bwd IAT Std
                                                  Bwd IAT Max
                                                                Bwd IAT Min
        1.1684e+05
                       1.1684e+05
                                     1.1684e+05
                                                   1.1684e+05
                                                                 1.1684e+05
count
        7.4103e+06
                       5.0774e+05
                                     9.7776e+05
                                                   2.9878e+06
                                                                 2.0459e+04
mean
std
        2.5758e+07
                       2.2712e+06
                                     4.0537e+06
                                                   1.1173e+07
                                                                 7.2024e+05
                                                                -1.5400e+02
       -1.5400e+02
                      -1.5400e+02
                                     0.0000e+00
                                                  -1.5400e+02
min
25%
                       1.0000e+00
                                     0.0000e+00
                                                   1.0000e+00
                                                                 1.0000e+00
        1.0000e+00
50%
        3.0000e+00
                       3.0000e+00
                                     0.0000e+00
                                                   3.0000e+00
                                                                 2.0000e+00
                       2.6170e+03
                                                   4.2220e+03
75%
        4.8980e+03
                                     2.4445e+03
                                                                 2.7400e+02
        1.2000e+08
                       6.5000e+07
                                     6.8300e+07
                                                   1.1900e+08
                                                                 6.5000e+07
max
       Fwd PSH Flags
                       Bwd PSH Flags
                                       Fwd URG Flags
                                                       Bwd URG Flags
count
             116837.0
                         116837.0000
                                             116837.0
                                                             116837.0
                  0.0
                               0.0651
                                                  0.0
                                                                  0.0
mean
                  0.0
                                                  0.0
                                                                  0.0
std
                               0.2467
                  0.0
                                                  0.0
                                                                  0.0
min
                               0.0000
25%
                  0.0
                               0.0000
                                                  0.0
                                                                  0.0
50%
                  0.0
                               0.0000
                                                  0.0
                                                                  0.0
75%
                                                  0.0
                                                                  0.0
                  0.0
                               0.0000
                  0.0
                               1.0000
                                                  0.0
                                                                  0.0
max
                        Bwd Header Len
                                           Fwd Pkts/s
                                                        Bwd Pkts/s
                                                                     Pkt Len Min
       Fwd Header Len
           116837.0000
                            116837.0000
                                           116837.0000
                                                         1.1684e+05
                                                                     116837.0000
count
mean
              133.6369
                               211.6137
                                             3006.3801
                                                        6.3225e+05
                                                                          12.4065
std
             1953.4799
                              3727.6632
                                            47274.7719
                                                        8.3393e+05
                                                                          22.9663
min
                0.0000
                                 0.0000
                                                0.0000
                                                        0.0000e+00
                                                                           0.0000
25%
                0.0000
                                 0.0000
                                                0.0000
                                                        3.0441e+02
                                                                           0.0000
50%
                8.0000
                                20.0000
                                                0.2562
                                                        1.0826e+03
                                                                           0.0000
75%
                                24.0000
                                              244.9780
                                                         1.0000e+06
                                                                          30.0000
               20.0000
                                                        2.0000e+06
max
           360448.0000
                            681904.0000
                                         1000000.0000
                                                                         448.0000
```

	Pkt Len Max Pkt	Len Mean Pkt Len St	d Pkt Len Var FIN	Flag Cnt \
count	116837.0000 11	6837.0000 116837.000	00 1.1684e+05 116	837.0000
mean	1071.1880	148.6180 241.329	01 6.6397e+05	0.0208
std	4917.8551	391.6154 778.280	05 9.4256e+06	0.1426
min	0.0000	0.0000 0.000	0.0000e+00	0.0000
25%	0.0000	0.0000 0.000	0.0000e+00	0.0000
50%	31.0000	7.6000 12.65	57 1.6017e+02	0.0000
75%	379.0000	150.3333 163.310	01 2.6670e+04	0.0000
max		8354.0000 31345.422		1.0000
	SYN Flag Cnt RS	T Flag Cnt PSH Flag	Cnt ACK Flag Cnt U	RG Flag Cnt \
count	116837.0000 1	16837.0000 116837.0	0000 116837.0000	116837.0
mean	0.1155	0.0004 0.0	0.1763	0.0
std	0.3196	0.0194 0.2	2467 0.3810	0.0
min	0.0000	0.0000 0.0	0.000	0.0
25%	0.0000	0.0000 0.0	0.000	0.0
50%	0.0000	0.0000 0.0	0.000	0.0
75%	0.0000	0.0000 0.0	0.000	0.0
max	1.0000		0000 1.0000	0.0
	CWE Flag Count	ECE Flag Cnt Down/U _l	Ratio Pkt Size Avg	; \
count	116837.0	116837.0 11683	37.0000 116837.0000)
mean	0.0	0.0	0.9565 165.8051	
std	0.0	0.0	1.2297 414.5476	}
min	0.0	0.0	0.0000 0.0000)
25%	0.0	0.0	0.0000 0.0000)
50%	0.0	0.0	0.0000 9.5000	
75%	0.0	0.0	1.0000 189.5000	
max	0.0	0.0	7.0000 21413.0000	
	Fwd Seg Size Avg	Bwd Seg Size Avg l	Fwd Byts/b Avg Fwd P	kts/b Avg \
count	116837.0000	116837.0000	116837.0	116837.0
mean	89.5535	193.1011	0.0	0.0
std	448.3130	575.7508	0.0	0.0
min	0.0000	0.0000	0.0	0.0
25%	0.0000	0.0000	0.0	0.0
50%	0.0000	0.0000	0.0	0.0
75%	36.0000	186.3333	0.0	0.0
max	32119.5000	22660.7227	0.0	0.0
	Fwd Blk Rate Avg	Bwd Byts/b Avg Bwo	d Pkts/b Avg Bwd Blk	Rate Avg \
count	116837.0	116837.0	116837.0	116837.0
mean	0.0	0.0	0.0	0.0
std	0.0	0.0	0.0	0.0
min	0.0	0.0	0.0	0.0
OF*/	0.0	0.0	0.0	0.0
25%	0.0	0.0	0.0	0.0

```
75%
                          0.0
                                            0.0
                                                             0.0
                                                                                0.0
                          0.0
                                            0.0
                                                             0.0
                                                                                0.0
     max
            Subflow Fwd Pkts
                                Subflow Fwd Byts
                                                   Subflow Bwd Pkts
                                                                      Subflow Bwd Byts
                  116837.0000
                                      1.1684e+05
                                                        116837.0000
                                                                             1.1684e+05
     count
                                      1.9646e+03
                                                                             2.4182e+04
     mean
                      14.7100
                                                             11.7173
     std
                    2665.8347
                                      1.1944e+05
                                                            180.7494
                                                                             5.8886e+05
     min
                       0.0000
                                      0.0000e+00
                                                              1.0000
                                                                             0.0000e+00
     25%
                                      0.0000e+00
                                                              2.0000
                                                                             0.0000e+00
                       0.0000
     50%
                       1.0000
                                      0.0000e+00
                                                              2.0000
                                                                             0.0000e+00
     75%
                       1.0000
                                      4.2000e+01
                                                              3.0000
                                                                             6.2200e+02
                  910748.0000
                                      3.1565e+07
                                                          34094.0000
                                                                             1.0744e+08
     max
            Init Fwd Win Byts
                                 Init Bwd Win Byts
                                                     Fwd Act Data Pkts
                      116837.0
                                       116837.0000
                                                            116837.0000
     count
     mean
                          -1.0
                                        16540.6892
                                                                 2.2789
                           0.0
     std
                                        27976.4085
                                                                43.7252
     min
                          -1.0
                                            -1.0000
                                                                 0.0000
     25%
                          -1.0
                                            -1.0000
                                                                 0.0000
     50%
                          -1.0
                                            -1.0000
                                                                 0.0000
     75%
                          -1.0
                                        64239.0000
                                                                 1.0000
                                                             11180.0000
                          -1.0
                                        65535.0000
     max
            Fwd Seg Size Min
                               Active Mean
                                             Active Std
                                                          Active Max
                                                                       Active Min
                     116837.0
                                 1.1684e+05
                                              1.1684e+05
                                                           1.1684e+05
                                                                       1.1684e+05
     count
     mean
                          0.0
                                 1.1060e+05
                                             8.4034e+04
                                                           2.3323e+05
                                                                       5.0161e+04
                                                           1.8990e+06
     std
                          0.0
                                 1.0549e+06
                                              8.4923e+05
                                                                       7.8740e+05
                          0.0
     min
                                 0.0000e+00
                                              0.0000e+00
                                                           0.0000e+00
                                                                       0.0000e+00
     25%
                          0.0
                                 0.0000e+00
                                              0.0000e+00
                                                           0.0000e+00
                                                                       0.0000e+00
     50%
                          0.0
                                 0.0000e+00
                                              0.0000e+00
                                                           0.0000e+00
                                                                       0.0000e+00
     75%
                          0.0
                                                                       0.0000e+00
                                 0.0000e+00
                                              0.0000e+00
                                                           0.0000e+00
                          0.0
                                 1.0400e+08
                                             6.8300e+07
                                                           1.0400e+08
                                                                       1.0400e+08
     max
             Idle Mean
                           Idle Std
                                        Idle Max
                                                     Idle Min
                                                                      Label
            1.1684e+05
                         1.1684e+05
                                      1.1684e+05
                                                   1.1684e+05
                                                                116837.0000
     count
            2.6406e+06
                         3.5382e+05
                                      2.9675e+06
                                                   2.3280e+06
                                                                     0.4144
     mean
                         2.6844e+06
     std
            1.0303e+07
                                      1.1360e+07
                                                   9.7366e+06
                                                                     0.4926
            0.0000e+00
                         0.0000e+00
                                      0.0000e+00
                                                   0.0000e+00
     min
                                                                     0.0000
     25%
            0.0000e+00
                         0.0000e+00
                                      0.0000e+00
                                                   0.0000e+00
                                                                     0.0000
     50%
            0.0000e+00
                         0.0000e+00
                                      0.0000e+00
                                                   0.0000e+00
                                                                     0.0000
     75%
            0.0000e+00
                         0.0000e+00
                                      0.0000e+00
                                                   0.0000e+00
                                                                     1.0000
     max
            1.1900e+08
                         7.3000e+07
                                      1.1900e+08
                                                   1.1900e+08
                                                                     1.0000
[]: # liczba rekordów w każdej klasie
```

print(pd.value_counts(df1['Label'], sort = False))# ilość rekordów w klasie Ou (normalny przepływ) jest większa niż w klasie 1 (atak DDoS), co może wpłynąću

→na wyniki klasyfikacji

```
0 68424
1 48413
```

Name: Label, dtype: int64

```
[]: # Xn = df1.iloc[0:524].copy()

# Xa = df1.iloc[524:600].copy()

# df = pd.concat([Xn,Xa], ignore_index=True) #łączenie dwóch zbiorów danych wu

→ jeden

# print(pd.value_counts(df1['Label'], sort = False)) #sprawdzenie czy liczbau

→rekordów w klasie 0 i 1 jest taka sama jak w oryginalnym zbiorze danych
```

```
[]: df1_cut = df1.drop(["Label","Src IP","Src Port","Dst IP","Dst U → Port", "Protocol", "Flow ID", "Timestamp"], axis=1) #usuwanie kolumn, które nie w będą brane pod uwagę w klasyfikacji
y1 = df1["Label"]
df1_cut
```

[]:	Flow Duration	Tot Fwd Pkts	Tot Bwd Pkts	TotLen Fwd Pkts	\
0	245230	44	40	124937	
1	1605449	107	149	1071	
2	53078	5	5	66	
3	6975	1	1	0	
4	190141	13	16	780	
•••	•••	•••	•••	•••	
116832	2	0	2	0	
116833	2	0	2	0	
116834	2	0	2	0	
116835	64815031	910748	1	0	
116836	70611188	19	1	0	

	TotLen Bwd Pkts	Fwd Pkt Len Max	Fwd Pkt Len Min	Fwd Pkt Len Mean	\
0	1071	9100	0	2839.4773	
1	439537	517	0	10.0093	
2	758	66	0	13.2000	
3	0	0	0	0.0000	
4	11085	427	0	60.0000	
•••	•••	•••	•••	•••	
116832	0	0	0	0.0000	
116833	0	0	0	0.0000	
116834	0	0	0	0.0000	
116835	0	0	0	0.0000	
116836	0	0	0	0.0000	

	Fwd Pkt Len Std	Bwd Pkt Len Max	Bwd Pkt Len Min	Bwd Pkt Len Mean	\
0	1839.5083	517	0	26.7750	
1	67.4967	27300	0	2949.9128	
2	29.5161	638	0	151.6000	

3	0.0000		0	0	0.0000	
4	130.0429	2	596	0	692.8125	
 116832	0.0000	•••	0	0	0.0000	
116833	0.0000		0	0	0.0000	
116834	0.0000		0	0	0.0000	
116835	0.0000		0	0	0.0000	
116836	0.0000		0	0	0.0000	
110000	0.0000		v	· ·	0.0000	
	Bwd Pkt Len Std	Flow Byts/s	Flow Pkts/s	Flow IAT Mea	an \	
0	109.1880	513835.9907	342.5356	2.9546e+0	03	
1	3012.5895	274445.3421	159.4569	6.2959e+0	03	
2	276.8263	15524.3227	188.4020	5.8976e+0	03	
3	0.0000	0.0000	286.7384	6.9750e+0	03	
4	794.1573	62401.0603	152.5184	6.7908e+0	03	
•••	***	•••	•••	***		
116832	0.0000	0.0000	1000000.0000	2.0000e+0	00	
116833	0.0000	0.0000	1000000.0000	2.0000e+0	00	
116834	0.0000	0.0000	1000000.0000	2.0000e+0	00	
116835	0.0000	0.0000	14051.5091	7.1167e+0	01	
116836	0.0000	0.0000	0.2832	3.7164e+0	06	
					Fwd IAT Mean	\
0	7.9532e+03	64066	-44	238564	5.5480e+03	
1	5.6408e+04	859760	-102	1332121	1.2567e+04	
2	1.5185e+04	46232	19	50302	1.2576e+04	
3	0.0000e+00	6975	6975	0	0.0000e+00	
4	1.2933e+04	38521	-54	86882	7.2402e+03	
116832	0.0000e+00	2	2	0	0.0000e+00	
116833	0.0000e+00	2	2	0	0.0000e+00	
116834	0.0000e+00	2	2	0	0.0000e+00	
116835	4.0770e+03	2399309	-30	64700000	7.1067e+01	
116836	2.2419e+06	11100000	1227799	67500000	3.7507e+06	
	Fwd IAT Std Fwd	IAT May Fud	IAT Min Bwd	TAT Tot Bud	IAT Mean \	
0	1.0446e+04	64066	2		5287.9487	
1	8.3434e+04	861138	2		0831.9595	
2	2.2522e+04	46251	67		3240.5000	
3	0.0000e+00	0	0	0	0.0000	
4	1.3051e+04	38805	1		2676.0667	
<u></u>	1.5051e+04		<u>.</u>		2010.0001	
 116832	 0.0000e+00	0	0	2	2.0000	
116833	0.0000e+00	0	0	2	2.0000	
116834	0.0000e+00	0	0	2	2.0000	
116835	4.0759e+03	2399309	-30	0	0.0000	
110000						
116836	2.3018e+06	11100000	1227799	0	0.0000	

0 1 2 3	Bwd IAT Std 12986.4688 73926.6524 22052.0441 0.0000	Bwd IAT Max 79070 861129 46258	Bwd	IAT	Min 29 1 405	Fwd	PSH Fla	ngs 0 0 0	Bwd PS	H Fla	0 0 0 0	\
4	15949.0928	38521			1			0			0	
•••	•••	•••	•••			•••						
116832	0.0000	2			2			0			0	
116833	0.0000	2			2			0			0	
116834	0.0000	2			2			0			0	
116835	0.0000	0			0			0			0	
116836	0.0000	0			0			0			0	
	Fwd URG Flag	gs Bwd URG Fl	ags	Fwd	Head	er Le	en Bwd	Head	er Len	\		
0		0	0			88	30		804			
1		0	0			214	10		3004			
2		0	0			10	00		124			
3		0	0			2	20		20			
4		0	0			26	30		344			
•••	•••	•••					••					
116832		0	0				0		0			
116833		0	0				0		0			
116834		0	0				0		0			
116835		0	0				0		0			
116836		0	0				0		0			
	Fwd Pkts/s		Pkt	Len	Min	Pkt	Len Max	Pk	t Len	Mean	\	
0	179.4234	163.1122			0		9100)	1482.	4471		
1	66.6480	92.8089			0		27300		1714.			
2	94.2010	94.2010			0		638	3	74.	9091		
3	143.3692	143.3692			0		C)		0000		
4	68.3703	84.1481			0		2596	5	395.	5000		
•••	•••	•••	•••			•••		•••				
116832	0.0000	1000000.0000			0		C)		0000		
116833	0.0000	1000000.0000			0		C)	0.	0000		
116834	0.0000	1000000.0000			0		C)		0000		
116835	14051.4937	0.0154			0		C)	0.	0000		
116836	0.2691	0.0142			0		C)	0.	0000		
					_							
	Pkt Len Std	Pkt Len Var	FIN	Flag	g Cnt	SYN	I Flag C		RST F1	ag Cn		\
0	1933.2683	3.7375e+06			0			1			0	
1	2713.4659	7.3629e+06			0			1			0	
2	190.8075	3.6407e+04			0			1			0	
3	0.0000	0.0000e+00			0			0			0	
4	661.6917	4.3784e+05			0			1			0	
•••	•••	•••		••		•••		•••				

```
116832
              0.0000
                        0.0000e+00
                                                  0
                                                                 0
                                                                                 0
              0.0000
                        0.0000e+00
                                                  0
                                                                  0
                                                                                 0
116833
116834
              0.0000
                        0.0000e+00
                                                  0
                                                                  0
                                                                                 0
                                                  0
116835
              0.0000
                        0.0000e+00
116836
              0.0000
                        0.0000e+00
                                                  0
                                                                  0
                                                                                 0
        PSH Flag Cnt
                                        URG Flag Cnt
                                                       CWE Flag Count
                        ACK Flag Cnt
0
                     0
                                    1
                                                    0
                     0
                                    0
                                                    0
                                                                      0
1
2
                     0
                                    0
                                                    0
                                                                      0
3
                     0
                                    1
4
                                    0
                                                    0
116832
                     0
                                    0
                                                    0
                                                                      0
                     0
                                    0
                                                    0
                                                                      0
116833
                     0
                                                                      0
116834
                                    0
                                                    0
                                                                      0
116835
                     0
                                    0
                                                    0
116836
        ECE Flag Cnt
                        Down/Up Ratio
                                         Pkt Size Avg
                                                        Fwd Seg Size Avg
0
                     0
                                            1500.0952
                                                                2839.4773
                                     0
1
                     0
                                     1
                                            1721.1250
                                                                   10.0093
2
                     0
                                      1
                                               82.4000
                                                                   13.2000
3
                     0
                                      1
                                                0.0000
                                                                    0.0000
4
                     0
                                             409.1379
                                                                   60.0000
116832
                                                                    0.0000
                     0
                                     0
                                                0.0000
116833
                     0
                                     0
                                                0.0000
                                                                    0.0000
116834
                     0
                                     0
                                                0.0000
                                                                    0.0000
                     0
                                     0
                                                0.0000
                                                                    0.0000
116835
116836
                     0
                                     0
                                                0.0000
                                                                    0.0000
        Bwd Seg Size Avg
                                                                Fwd Blk Rate Avg
                            Fwd Byts/b Avg
                                              Fwd Pkts/b Avg
0
                   26.7750
                                           0
                                                             0
                                           0
                                                             0
                                                                                 0
1
                2949.9128
                 151.6000
2
                                           0
                                                             0
                                                                                 0
3
                   0.0000
                                           0
                                                             0
                                                                                 0
4
                 692.8125
                                           0
                                                             0
                                                                                 0
                     •••
                                           0
                                                             0
                                                                                 0
116832
                   0.0000
                                           0
                                                             0
                                                                                 0
116833
                   0.0000
116834
                   0.0000
                                           0
                                                             0
                                                                                 0
116835
                   0.0000
                                           0
                                                             0
                                                                                 0
116836
                   0.0000
                                           0
                                                             0
                                                                                 0
        Bwd Byts/b Avg Bwd Pkts/b Avg Bwd Blk Rate Avg
                                                                Subflow Fwd Pkts
0
                                                                                44
```

1	0	0	0	107
2	0	0	0	5
3	0	0	0	1
4	0	0	0	13
			_	
116832	0	0	0	0
116833	0	0	0	0
116834	0	0	0	0
116835	0	0	0	910748
116836	0	0	0	19
^	Subflow Fwd Byts	Subflow Bwd Pkts Subfl		\
0	124937	40	1071	
1	1071	149	439537	
2	66	5	758	
3	0	1	0	
4	780	16	11085	
•••	•••		•••	
116832	0	2	0	
116833	0	2	0	
116834	0	2	0	
116835	0	1	0	
116836	0	1	0	
0		Init Bwd Win Byts Fwd		
0	-1	65535	4:	1
1	-1 -1	65535 64240	4:	1 4
1 2	-1 -1 -1	65535 64240 64240	4	1 4 1
1 2 3	-1 -1 -1 -1	65535 64240 64240 64239	4	1 4 1 0
1 2	-1 -1 -1	65535 64240 64240	4	1 4 1
1 2 3 4 	-1 -1 -1 -1 -1	65535 64240 64240 64239 64240	4	1 4 1 0 3
1 2 3 4 116832	-1 -1 -1 -1 -1 	65535 64240 64240 64239 64240 	4 	1 4 1 0 3
1 2 3 4 116832 116833	-1 -1 -1 -1 -1 	65535 64240 64240 64239 64240 	4 	1 4 1 0 3 0
1 2 3 4 116832 116833 116834	-1 -1 -1 -1 -1 	65535 64240 64240 64239 64240 -1 -1	4 	1 4 1 0 3 0 0
1 2 3 4 116832 116833 116834 116835	-1 -1 -1 -1 -1 -1 -1 -1	65535 64240 64240 64239 64240 1 -1 -1	4 	1 4 1 0 3 0 0 0 0
1 2 3 4 116832 116833 116834	-1 -1 -1 -1 -1 	65535 64240 64240 64239 64240 -1 -1	4 	1 4 1 0 3 0 0
1 2 3 4 116832 116833 116834 116835	-1 -1 -1 -1 -1 -1 -1 -1	65535 64240 64240 64239 64240 1 -1 -1 -1		1 4 1 0 3 0 0 0 0 0
1 2 3 4 116832 116833 116834 116835 116836	-1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -	65535 64240 64240 64239 64240 1 -1 -1 -1 -1 -1	4 d Active Max	1 4 1 0 3 0 0 0 0 0 Active Min \
1 2 3 4 116832 116833 116834 116835 116836	-1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -	65535 64240 64240 64239 64240 1 -1 -1 -1 -1 -1 -1 -1 0.0000e+00 0.0000e+00	d Active Max	1 4 1 0 3 0 0 0 0 0 0 0 0 0
1 2 3 4 116832 116833 116834 116835 116836	-1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -	65535 64240 64240 64239 64240 -1 -1 -1 -1 -1 -1 0.0000e+00 0.0000e+00	4	1 4 4 1 1 0 3 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
1 2 3 4 116832 116833 116834 116835 116836	-1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -	65535 64240 64240 64239 64240 -1 -1 -1 -1 -1 -1 -1 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00 0.0000e+00 0.00000e+00	## Active Max 0 0 0 0 0 0	1 4 1 1 0 3 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
1 2 3 4 116832 116833 116834 116835 116836	-1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -	65535 64240 64240 64239 642401 -1 -1 -1 -1 -1 0.0000e+00	## Active Max O O O O O O O O O O O O O O O O O O O	1 4 4 1 1 0 0 3 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0
1 2 3 4 116832 116833 116834 116835 116836	-1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -	65535 64240 64240 64239 642401 -1 -1 -1 -1 -1 -1 0.0000e+00	## Active Max O O O O O O O O O	1 4 1 1 0 3 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
1 2 3 4 116832 116833 116834 116835 116836	-1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -	65535 64240 64240 64239 642401 -1 -1 -1 -1 -1 -1 -1 0.0000e+00	d Active Max 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 4 4 1 1 0 3 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
1 2 3 4 116832 116833 116834 116835 116836	-1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -	65535 64240 64240 64239 642401 -1 -1 -1 -1 -1 -1 -1 0.0000e+00	d Active Max 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 4 4 1 1 0 0 3 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0
1 2 3 4 116832 116833 116834 116835 116836	-1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -	65535 64240 64240 64239 642401 -1 -1 -1 -1 -1 -1 -1 0.0000e+00	d Active Max 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 4 4 1 1 0 3 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

	116835				0000e+0		0.0000e+0		0	0	
	116836		(5.0	6393e+(06 6	3.0924e+0	6 1260	00000	1227799	
		Idle Mean	Id]	le Std	Idle	Max	Idle Mi	n			
	0	0.0	0.000	00e+00		0		0			
	1	0.0	0.000	00e+00		0		0			
	2	0.0	0.000	00e+00		0		0			
	3	0.0	0.000	00e+00		0		0			
	4	0.0	0.000	00e+00		0		0			
		•••	•••		•••	•••					
	116832	0.0	0.000	00e+00		0		0			
	116833	0.0	0.000	00e+00		0		0			
	116834	0.0	0.000	00e+00		0		0			
	116835	0.0	0.000	00e+00		0		0			
	116836	6750987.0	2.919	97e+06	11100	0000	510313	7			
				_							
	[11683]	7 rows x 76	columr	nsJ							
[]:	df1_cu	t.describe()									
[]:		Flow Durati	on To	ot Fwd	Pkts	Tot	Bwd Pkts	Totlen	Fwd Pkts	\	
L J.	count	1.1684e+		116837			8837.0000		.1684e+05	`	
	mean	7.9813e+			.7100		11.7173		.9645e+03		
	std	2.6577e+			.8347		180.7494		.1947e+05		
	min	-1.5400e+			.0000		1.0000		.0000e+00		
	25%	2.0000e+			.0000		2.0000		.0000e+00		
	50%	2.4400e+			.0000		2.0000		.0000e+00		
	75%	8.3240e+	03	1	.0000		3.0000	4	.2000e+01		
	max	1.2000e+	08 9	910748	.0000	34	094.0000	3	.1600e+07		
		TotLen Bwd	Pkts	Fwd P	kt Len	Max	Fwd Pkt	Len Min	Fwd Pkt	Len Mean	\
	count	1.1684	e+05	1	16837.0	0000	116	837.0000	11	6837.0000	
	mean	2.4176	e+04		249.4	1013		13.0582		89.5535	
	std	5.8808	e+05		1110.8	3013		52.6070		448.3130	
	min	0.0000	e+00		0.0	0000		0.0000		0.0000	
	25%	0.0000	e+00		0.0000			0.0000		0.0000	0
	50%	0.0000	e+00		0.0	0000		0.0000		0.0000	
	75%	6.2200	e+02		42.0	0000		30.0000		36.0000	
	max	1.0700	e+08	(64239.0	0000	3	900.0000	3:	2119.5000	

Bwd Pkt Len Min Bwd Pkt Len Mean \

116837.0000

193.1011

575.7508

0.0000

0.0000

0.0000

116837.0000

15.2244

34.2332

0.0000

0.0000

0.0000

Bwd Pkt Len Max

116837.0000

936.0695

4830.3437

0.0000

0.0000

0.0000

Fwd Pkt Len Std

116837.0000

94.6916

0.0000

0.0000

0.0000

555.5502

count

mean std

min 25%

50%

75%	0.0000	345.00	000	31.0000	186.3333	
max	45423.8325	64239.0000		761.0000	22660.7227	
	Bwd Pkt Len Std	•	Flow Pkts/s	Flow IAT Mean		
count	116837.0000	1.1684e+05	1.1684e+05	1.1684e+05	1.1684e+05	
mean	224.0320	1.9508e+05	6.3526e+05	3.1627e+05	8.2208e+05	
std	817.4183	1.1239e+06	8.3569e+05	1.4636e+06	3.2238e+06	
min	0.0000	-2.6271e+05	-1.6949e+04	-1.5400e+02	0.0000e+00	
25%	0.0000	0.0000e+00	5.0441e+02	2.0000e+00	0.0000e+00	
50%	0.0000	4.1564e+00	1.4493e+03	9.5367e+02	0.0000e+00	
75%	167.3091	1.1896e+05	1.0000e+06	3.1470e+03	2.6495e+03	
max	32119.5000	8.6300e+07	3.0000e+06	1.1900e+08	6.2400e+07	
	Flow IAT Max Fl	Low IAT Min Fw	d IAT Tot F	Fwd IAT Mean Fu	√d IAT Std \	
count	1.1684e+05		1.1684e+05		l.1684e+05	
mean			7.6600e+06		l.1064e+06	
std			2.6316e+07		1.6894e+06	
min			0.00100+00		0.0000e+00	
25%	2.0000e+00		0.0000e+00		0.0000e+00	
50%	1.9680e+03		0.0000e+00		0.0000e+00	
75%	6.8360e+03		0.0000e+00		0.0000e+00	
max	1.1900e+08		.2000e+08		3.4400e+07	
man	1.10000	1.10000		1.10000		
	Fwd IAT Max Fwd	d IAT Min Bwd	IAT Tot Bwo	d IAT Mean Bwd	IAT Std \	
count	1.1684e+05 1.	1684e+05 1.1	.684e+05 1	1.1684e+05 1.1	1684e+05	
mean	3.0362e+06 5.	4238e+04 7.4	103e+06 5	5.0774e+05 9.7	7776e+05	
std	1.1294e+07 1.	1689e+06 2.5	5758e+07 2	2.2712e+06 4.0)537e+06	
min	0.0000e+00 -3.	0000e+01 -1.5	5400e+02 -1	1.5400e+02 0.0	0000e+00	
25%	0.0000e+00 0.	.0000e+00 1.0	0000e+00 1	1.0000e+00 0.0	0000e+00	
50%	0.0000e+00 0.	.0000e+00 3.0	0000e+00 3	3.0000e+00 0.0	0000e+00	
75%	0.0000e+00 0.	.0000e+00 4.8	3980e+03 2	2.6170e+03 2.4	1445e+03	
max	1.1900e+08 1.	1800e+08 1.2	2000e+08 6	6.5000e+07 6.8	3300e+07	
			•	•	Fwd URG Flags \	
count		1684e+05	116837.0	116837.0000	116837.0	
mean		.0459e+04	0.0	0.0651	0.0	
std		.2024e+05	0.0	0.2467	0.0	
min		5400e+02	0.0	0.0000	0.0	
25%		.0000e+00	0.0	0.0000	0.0	
50%		.0000e+00	0.0	0.0000	0.0	
75%		7400e+02	0.0	0.0000	0.0	
max	1.1900e+08 6.	.5000e+07	0.0	1.0000	0.0	
	Bwd URG Flags F	Wd Header Len	Bwd Header	Len Fwd Pkts	s/s \	
count	116837.0	116837.0000	116837.0			
mean	0.0	133.6369	211.6			
std	0.0	1953.4799	3727.6			
Dou	0.0	1000.1100	0121.0	1121111		

min	0.0	0.000	00	0.0000	0.	.0000	
25%	0.0	0.000		0.0000		0.0000	
50%	0.0	8.000	00	20.0000		. 2562	
75%	0.0	20.000	00	24.0000		.9780	
max	0.0	360448.000	00 6819	904.0000			
	Bwd Pkts/s Pk	kt Len Min Pkt	t Len Max	Pkt Len	Mean Pkt	t Len Std \	
count	1.1684e+05 11	16837.0000 116	3837.0000	116837.	0000 116	8837.0000	
mean	6.3225e+05	12.4065 1	1071.1880	148.	6180	241.3291	
std	8.3393e+05	22.9663	4917.8551	391.	6154	778.2805	
min	0.0000e+00	0.0000	0.0000	0.	0000	0.0000	
25%	3.0441e+02	0.0000	0.0000	0.	0000	0.0000	
50%	1.0826e+03	0.0000	31.0000	7.	6000	12.6557	
75%	1.0000e+06	30.0000	379.0000	150.3333		163.3101	
max	2.0000e+06	448.0000 64	1239.0000	18354.	0000 31	1345.4224	
	Pkt Len Var F	FIN Flag Cnt S	SYN Flag C	nt RST F	lag Cnt	PSH Flag Cnt	\
count	1.1684e+05	116837.0000	116837.00		37.0000	116837.0000	
mean	6.6397e+05	0.0208	0.11	55	0.0004	0.0651	
std	9.4256e+06	0.1426	0.319	96	0.0194	0.2467	
min	0.0000e+00	0.0000	0.000	00	0.0000	0.0000	
25%	0.0000e+00	0.0000	0.0000		0.0000 0.0		
50%	1.6017e+02	0.0000	0.000		0.0000	0.0000	
75%	2.6670e+04	0.0000	0.000	00	0.0000	0.0000	
max	9.8300e+08	1.0000	1.000	00	1.0000	1.0000	
	ACK Flag Cnt	URG Flag Cnt	CWE Flag	Count EC	E Flag Cr	nt \	
count	116837.0000	116837.0	_	837.0	116837		
mean	0.1763	0.0		0.0	0.	.0	
std	0.3810	0.0	0.0		0.0		
min	0.0000	0.0	0.0		0.0		
25%	0.0000	0.0	0.0		0.0		
50%	0.0000	0.0	0.0		0.0		
75%	0.0000	0.0	0.0		0.0		
max	1.0000	0.0		0.0	0.	.0	
	Down/Up Ratio	Pkt Size Avg	Fwd Seg S	Size Avg	Bwd Seg	Size Avg \	
count	116837.0000	116837.0000	_	837.0000	_	6837.0000	
mean	0.9565	165.8051	89.5535		193.1011		
std	1.2297	414.5476	448.3130				
min	0.0000	0.0000		0.0000	0.0000		
25%	0.0000	0.0000		0.0000	0.0000		
50%	0.0000	9.5000		0.0000	0.0000		
75%	1.0000	189.5000		36.0000	186.3333		
max	7.0000	21413.0000	32:	119.5000	22	2660.7227	

Fwd Byts/b Avg Fwd Pkts/b Avg Fwd Blk Rate Avg Bwd Byts/b Avg $\$

```
116837.0
                               116837.0
                                                   116837.0
                                                                    116837.0
count
                   0.0
                                    0.0
                                                        0.0
                                                                         0.0
mean
std
                   0.0
                                    0.0
                                                        0.0
                                                                         0.0
min
                   0.0
                                    0.0
                                                        0.0
                                                                         0.0
25%
                                    0.0
                                                        0.0
                                                                         0.0
                   0.0
50%
                   0.0
                                    0.0
                                                        0.0
                                                                         0.0
75%
                   0.0
                                    0.0
                                                        0.0
                                                                         0.0
                   0.0
                                    0.0
                                                        0.0
                                                                         0.0
max
       Bwd Pkts/b Avg
                         Bwd Blk Rate Avg
                                                                Subflow Fwd Byts
                                            Subflow Fwd Pkts
              116837.0
                                 116837.0
count
                                                 116837.0000
                                                                      1.1684e+05
                   0.0
                                       0.0
                                                      14.7100
                                                                      1.9646e+03
mean
std
                   0.0
                                      0.0
                                                    2665.8347
                                                                      1.1944e+05
min
                   0.0
                                      0.0
                                                       0.0000
                                                                      0.0000e+00
25%
                   0.0
                                      0.0
                                                                      0.0000e+00
                                                       0.0000
50%
                   0.0
                                       0.0
                                                       1.0000
                                                                      0.0000e+00
75%
                   0.0
                                       0.0
                                                                      4.2000e+01
                                                       1.0000
                                       0.0
                                                                      3.1565e+07
max
                   0.0
                                                 910748.0000
       Subflow Bwd Pkts
                           Subflow Bwd Byts
                                              Init Fwd Win Byts
                                 1.1684e+05
                                                        116837.0
count
             116837.0000
                 11.7173
                                 2.4182e+04
                                                            -1.0
mean
                180.7494
                                                             0.0
std
                                 5.8886e+05
min
                  1.0000
                                 0.0000e+00
                                                            -1.0
25%
                                                            -1.0
                  2.0000
                                 0.0000e+00
50%
                  2.0000
                                 0.0000e+00
                                                            -1.0
75%
                  3.0000
                                 6.2200e+02
                                                            -1.0
              34094.0000
                                 1.0744e+08
                                                            -1.0
max
                                                Fwd Seg Size Min
       Init Bwd Win Byts
                            Fwd Act Data Pkts
                                                                    Active Mean
              116837.0000
                                  116837.0000
                                                         116837.0
count
                                                                     1.1684e+05
               16540.6892
                                        2.2789
                                                              0.0
                                                                     1.1060e+05
mean
std
               27976.4085
                                       43.7252
                                                              0.0
                                                                     1.0549e+06
min
                  -1.0000
                                        0.0000
                                                              0.0
                                                                     0.0000e+00
25%
                                                              0.0
                                                                     0.0000e+00
                  -1.0000
                                        0.0000
50%
                  -1.0000
                                        0.0000
                                                              0.0
                                                                     0.0000e+00
75%
               64239.0000
                                                              0.0
                                                                     0.0000e+00
                                        1.0000
               65535.0000
                                                              0.0
                                                                     1.0400e+08
                                   11180.0000
max
                                                             Idle Std
       Active Std
                    Active Max
                                 Active Min
                                               Idle Mean
                                                                          Idle Max
                                                           1.1684e+05
                                                                        1.1684e+05
count
       1.1684e+05
                    1.1684e+05
                                 1.1684e+05
                                              1.1684e+05
mean
       8.4034e+04
                    2.3323e+05
                                 5.0161e+04
                                              2.6406e+06
                                                           3.5382e+05
                                                                        2.9675e+06
                    1.8990e+06
                                 7.8740e+05
                                              1.0303e+07
                                                           2.6844e+06
                                                                        1.1360e+07
std
       8.4923e+05
min
       0.0000e+00
                    0.0000e+00
                                 0.0000e+00
                                              0.0000e+00
                                                           0.0000e+00
                                                                        0.0000e+00
                    0.0000e+00
25%
       0.0000e+00
                                 0.0000e+00
                                              0.0000e+00
                                                           0.0000e+00
                                                                        0.0000e+00
50%
                    0.0000e+00
                                 0.0000e+00
                                                                        0.0000e+00
       0.0000e+00
                                              0.0000e+00
                                                           0.0000e+00
                                 0.0000e+00
75%
       0.0000e+00
                    0.0000e+00
                                              0.0000e+00
                                                           0.0000e+00
                                                                        0.0000e+00
```

```
6.8300e+07 1.0400e+08 1.0400e+08 1.1900e+08 7.3000e+07 1.1900e+08
    max
             Idle Min
    count 1.1684e+05
           2.3280e+06
    mean
    std
           9.7366e+06
           0.0000e+00
    min
    25%
           0.0000e+00
    50%
           0.0000e+00
    75%
           0.0000e+00
           1.1900e+08
    max
[]: x_mean = np.transpose(pd.DataFrame(df1_cut.mean())) #$rednia wartość dla każdej_
     ⇔kolumny
    x mean
[]:
       Flow Duration Tot Fwd Pkts Tot Bwd Pkts TotLen Fwd Pkts \
                            14.71
                                        11.7173
          7.9813e+06
                                                      1964.5157
       TotLen Bwd Pkts Fwd Pkt Len Max Fwd Pkt Len Min Fwd Pkt Len Mean \
            24175.7512
                              249.4013
                                                13.0582
                                                                 89.5535
       Fwd Pkt Len Std Bwd Pkt Len Max Bwd Pkt Len Min Bwd Pkt Len Mean \
                              936.0695
                                                15.2244
               94.6916
       Bwd Pkt Len Std Flow Byts/s Flow Pkts/s Flow IAT Mean Flow IAT Std \
               224.032 195075.6787 635255.8243
                                                  316272.8206
                                                                822082.4506
       Flow IAT Max Flow IAT Min Fwd IAT Tot Fwd IAT Mean Fwd IAT Std \
         3.1797e+06
                       21967.5731
                                  7.6600e+06
                                               676296.2533
                                                             1.1064e+06
       Fwd IAT Max Fwd IAT Min Bwd IAT Tot Bwd IAT Mean Bwd IAT Std \
       3.0362e+06
                   54237.8257
                                7.4103e+06
                                              507736.2959 977761.1249
       Bwd IAT Max Bwd IAT Min Fwd PSH Flags Bwd PSH Flags Fwd URG Flags \
    0 2.9878e+06
                   20459.4595
                                          0.0
                                                                       0.0
                                                     0.0651
       Bwd URG Flags Fwd Header Len Bwd Header Len Fwd Pkts/s
                                                                 Bwd Pkts/s
    0
                 0.0
                           133.6369
                                           211.6137
                                                    3006.3801 632250.3869
       Pkt Len Min Pkt Len Max Pkt Len Mean Pkt Len Std Pkt Len Var
    0
           12.4065
                      1071.188
                                     148.618
                                                241.3291 663969.0073
       FIN Flag Cnt SYN Flag Cnt RST Flag Cnt PSH Flag Cnt ACK Flag Cnt \
    0
             0.0208
                          0.1155
                                        0.0004
                                                     0.0651
                                                                   0.1763
       URG Flag Cnt CWE Flag Count ECE Flag Cnt Down/Up Ratio Pkt Size Avg \
```

```
Fwd Seg Size Avg Bwd Seg Size Avg Fwd Byts/b Avg Fwd Pkts/b Avg \
                89.5535
                                193.1011
                                                     0.0
       Fwd Blk Rate Avg Bwd Byts/b Avg Bwd Pkts/b Avg Bwd Blk Rate Avg \
    0
                    0.0
                                   0.0
                                                   0.0
       Subflow Fwd Pkts Subflow Fwd Byts Subflow Bwd Pkts Subflow Bwd Byts \
                               1964.5865
                  14.71
                                                   11.7173
                                                                 24182.2356
       Init Fwd Win Byts \, Init Bwd Win Byts \, Fwd Act Data Pkts \, Fwd Seg Size Min \,
                                16540.6892
                    -1.0
                                                       2.2789
       Active Mean Active Std Active Max Active Min
                                                         Idle Mean
                                                                      Idle Std \
    0 110598.653 84033.8749 233233.2046 50161.3883 2.6406e+06 353818.7073
         Idle Max
                    Idle Min
    0 2.9675e+06 2.3280e+06
[]: x_max = np.transpose(pd.DataFrame(df1_cut.max())) #maksymalna wartość dla_
     ⇔każdej kolumny
[]: x_min = np.transpose(pd.DataFrame(df1_cut.min())) #minimalna wartość dla każdeju
     ⇔kolumny
    x min
     Flow Duration Tot Fwd Pkts Tot Bwd Pkts TotLen Fwd Pkts \
[]:
              -154.0
                              0.0
                                            1.0
                                                            0.0
       TotLen Bwd Pkts Fwd Pkt Len Max Fwd Pkt Len Min Fwd Pkt Len Mean \
                   0.0
                                   0.0
                                                    0.0
       Fwd Pkt Len Std Bwd Pkt Len Max Bwd Pkt Len Min Bwd Pkt Len Mean \
                                   0.0
                                                    0.0
                   0.0
       Bwd Pkt Len Std Flow Byts/s Flow Pkts/s Flow IAT Mean Flow IAT Std \
                   0.0 -262711.8644 -16949.1525
                                                       -154.0
       Flow IAT Max Flow IAT Min Fwd IAT Tot Fwd IAT Mean Fwd IAT Std \
             -154.0
                        -11570.0
                                          0.0
                                                        0.0
       Fwd IAT Max Fwd IAT Min Bwd IAT Tot Bwd IAT Mean Bwd IAT Std \
               0.0
                         -30.0
                                     -154.0
                                                   -154.0
    0
       Bwd IAT Max Bwd IAT Min Fwd PSH Flags Bwd PSH Flags Fwd URG Flags \
                                                                       0.0
            -154.0
                        -154.0
                                          0.0
                                                         0.0
```

0.0 0.0 0.9565

165.8051

0.0

0

```
0.0
                              0.0
                                             0.0
                                                       0.0
                                                                   0.0
       Pkt Len Min Pkt Len Max Pkt Len Mean Pkt Len Std Pkt Len Var \
                         0.0
                                      0.0
                                                 0.0
              0.0
       FIN Flag Cnt SYN Flag Cnt RST Flag Cnt PSH Flag Cnt ACK Flag Cnt \
                          0.0
                                       0.0
               0.0
                                                    0.0
       URG Flag Cnt CWE Flag Count ECE Flag Cnt Down/Up Ratio Pkt Size Avg \
               0.0
                             0.0
                                          0.0
                                                       0.0
       Fwd Seg Size Avg Bwd Seg Size Avg Fwd Byts/b Avg Fwd Pkts/b Avg \
                                  0.0
                                                  0.0
                  0.0
                                                                0.0
       Fwd Blk Rate Avg Bwd Byts/b Avg Bwd Pkts/b Avg Bwd Blk Rate Avg \
                   0.0
                                 0.0
                                                0.0
       Subflow Fwd Pkts Subflow Fwd Byts Subflow Bwd Pkts Subflow Bwd Byts \
                   0.0
                                   0.0
                                                   1.0
       Init Fwd Win Byts Init Bwd Win Byts Fwd Act Data Pkts Fwd Seg Size Min \
                   -1.0
                                    -1.0
                                                      0.0
       Active Mean Active Std Active Max Active Min Idle Mean Idle Std \
                        0.0
                                0.0
                                               0.0
       Idle Max Idle Min
           0.0
                    0.0
[]: x_std = np.transpose(pd.DataFrame(df1_cut.std())) #odchylenie standardowe dla_
    ⇔każdej kolumny
    x_std
[]: Flow Duration Tot Fwd Pkts Tot Bwd Pkts TotLen Fwd Pkts \
        2.6577e+07 2665.8347 180.7494 119469.3455
       TotLen Bwd Pkts Fwd Pkt Len Max Fwd Pkt Len Min Fwd Pkt Len Mean \
          588084.6298
                           1110.8013
                                              52.607
                                                             448.313
       Fwd Pkt Len Std Bwd Pkt Len Max Bwd Pkt Len Min Bwd Pkt Len Mean \
             555.5502
                           4830.3437
                                             34.2332
                                                            575.7508
       Bwd Pkt Len Std Flow Byts/s Flow Pkts/s Flow IAT Mean Flow IAT Std \
             817.4183 1.1239e+06 835691.9911 1.4636e+06
```

Bwd URG Flags Fwd Header Len Bwd Header Len Fwd Pkts/s Bwd Pkts/s \

```
Flow IAT Max Flow IAT Min Fwd IAT Tot Fwd IAT Mean Fwd IAT Std \
        1.1415e+07 734455.7095 2.6316e+07 3.1671e+06
                                                         4.6894e+06
       Fwd IAT Max Fwd IAT Min Bwd IAT Tot Bwd IAT Mean Bwd IAT Std \
    0 1.1294e+07 1.1689e+06
                              2.5758e+07 2.2712e+06 4.0537e+06
       Bwd IAT Max Bwd IAT Min Fwd PSH Flags Bwd PSH Flags Fwd URG Flags \
    0 1.1173e+07 720238.5491
                                        0.0
                                                   0.2467
                                                                    0.0
       Bwd URG Flags Fwd Header Len Bwd Header Len Fwd Pkts/s Bwd Pkts/s \
                                      3727.6632 47274.7719 833929.2923
                0.0
                         1953.4799
       Pkt Len Min Pkt Len Max Pkt Len Mean Pkt Len Std Pkt Len Var \
                    4917.8551
                              391.6154
                                             778.2805
          22.9663
                                                       9.4256e+06
       FIN Flag Cnt SYN Flag Cnt RST Flag Cnt PSH Flag Cnt ACK Flag Cnt \
                                      0.0194
            0.1426
                         0.3196
                                                  0.2467
                                                                 0.381
       URG Flag Cnt CWE Flag Count ECE Flag Cnt Down/Up Ratio Pkt Size Avg \
                                          0.0
               0.0
                              0.0
                                                     1.2297
       Fwd Seg Size Avg Bwd Seg Size Avg Fwd Byts/b Avg Fwd Pkts/b Avg \
               448.313
                              575.7508
                                                  0.0
       Fwd Blk Rate Avg Bwd Byts/b Avg Bwd Pkts/b Avg Bwd Blk Rate Avg \
                   0.0
                                 0.0
                                                0.0
       Subflow Fwd Pkts Subflow Fwd Byts Subflow Bwd Pkts Subflow Bwd Byts \
                            119436.887
                                               180.7494
             2665.8347
                                                              588860.536
       Init Fwd Win Byts Init Bwd Win Byts Fwd Act Data Pkts Fwd Seg Size Min \
    0
                    0.0
                              27976.4085
                                                   43.7252
                                                                       0.0
       Active Mean Active Std Active Max Active Min Idle Mean
                                                                  Idle Std \
    0 1.0549e+06 849226.4373 1.8990e+06 787399.9265 1.0303e+07 2.6844e+06
        Idle Max Idle Min
    0 1.1360e+07 9.7366e+06
[]: x_var = np.transpose(pd.DataFrame(df1_cut.var())) #wariancja dla każdej kolumny
[]: Flow Duration Tot Fwd Pkts Tot Bwd Pkts TotLen Fwd Pkts \
        7.0632e+14 7.1067e+06 32670.3502
                                               1.4273e+10
       TotLen Bwd Pkts Fwd Pkt Len Max Fwd Pkt Len Min Fwd Pkt Len Mean \
           3.4584e+11
                      1.2339e+06
                                      2767.4946
                                                        200984.5507
```

Fwd Pkt Len Std Bwd Pkt Len Max Bwd Pkt Len Min Bwd Pkt Len Mean \ 308635.9724 2.3332e+07 1171.9146 331488.9609 Bwd Pkt Len Std Flow Byts/s Flow Pkts/s Flow IAT Mean Flow IAT Std \ 668172.7314 1.2632e+12 6.9838e+11 2.1420e+12 1.0393e+13 Flow IAT Max Flow IAT Min Fwd IAT Tot Fwd IAT Mean Fwd IAT Std \ 1.3031e+14 5.3943e+11 6.9251e+14 1.0031e+13 2.1991e+13 Fwd IAT Max Fwd IAT Min Bwd IAT Tot Bwd IAT Mean Bwd IAT Std \ 0 1.2756e+14 1.3664e+12 6.6347e+14 5.1581e+12 1.6433e+13 Bwd IAT Max Bwd IAT Min Fwd PSH Flags Bwd PSH Flags Fwd URG Flags \ 0 1.2483e+14 5.1874e+11 0.0 0.0608 0.0 Bwd URG Flags Fwd Header Len Bwd Header Len Fwd Pkts/s Bwd Pkts/s \ 0.0 3.8161e+06 1.3895e+07 2.2349e+09 6.9544e+11 Pkt Len Min Pkt Len Max Pkt Len Mean Pkt Len Std Pkt Len Var \ 527.4506 2.4185e+07 153362.6397 605720.5979 8.8841e+13 FIN Flag Cnt SYN Flag Cnt RST Flag Cnt PSH Flag Cnt ACK Flag Cnt \ 0.1022 0.0004 0.0608 0.0203 URG Flag Cnt CWE Flag Count ECE Flag Cnt Down/Up Ratio Pkt Size Avg \ 0.0 0.0 1.5121 171849.6782 Fwd Seg Size Avg Bwd Seg Size Avg Fwd Byts/b Avg Fwd Pkts/b Avg \ 331488.9609 200984.5507 0.0 Fwd Blk Rate Avg Bwd Byts/b Avg Bwd Pkts/b Avg Bwd Blk Rate Avg \ 0.0 0.0 0.0 Subflow Fwd Pkts Subflow Fwd Byts Subflow Bwd Pkts Subflow Bwd Byts \ 7.1067e+06 1.4265e+10 32670.3502 3.4676e+11 Init Fwd Win Byts Init Bwd Win Byts Fwd Act Data Pkts Fwd Seg Size Min \ 0.0 7.8268e+08 1911.8968 0.0 0 Active Mean Active Std Active Max Active Min Idle Mean Idle Std \ 0 1.1129e+12 7.2119e+11 3.6063e+12 6.2000e+11 1.0615e+14 7.2062e+12 Idle Max Idle Min 0 1.2904e+14 9.4801e+13

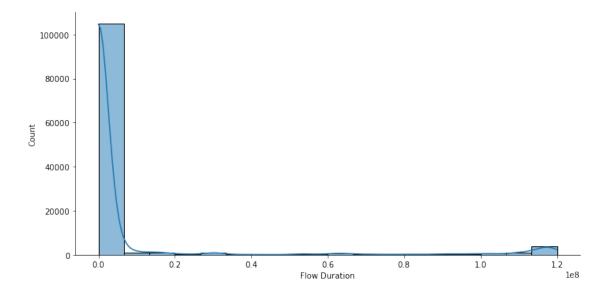
```
⇔kolumny
x_{median}
  Flow Duration Tot Fwd Pkts Tot Bwd Pkts TotLen Fwd Pkts \
         2440.0
                        1.0
                                    2.0
  TotLen Bwd Pkts Fwd Pkt Len Max Fwd Pkt Len Min Fwd Pkt Len Mean \
                            0.0
                                          0.0
             0.0
  Fwd Pkt Len Std Bwd Pkt Len Max Bwd Pkt Len Min Bwd Pkt Len Mean \
             0.0
                            0.0
                                           0.0
  Bwd Pkt Len Std Flow Byts/s Flow Pkts/s Flow IAT Mean Flow IAT Std \
                      4.1564 1449.2754
             0.0
                                             953.6667
  Flow IAT Max Flow IAT Min Fwd IAT Tot Fwd IAT Mean Fwd IAT Std \
        1968.0
                       3.0
                                  0.0
                                               0.0
  Fwd IAT Max Fwd IAT Min Bwd IAT Tot Bwd IAT Mean Bwd IAT Std \
                     0.0
                                 3.0
                                             3.0
  Bwd IAT Max Bwd IAT Min Fwd PSH Flags Bwd PSH Flags Fwd URG Flags \
                     2.0
                                  0.0
                                                0.0
         3.0
  Bwd URG Flags Fwd Header Len Bwd Header Len Fwd Pkts/s Bwd Pkts/s \
                        8.0
                                       20.0
           0.0
                                              0.2562 1082.6416
  Pkt Len Min Pkt Len Max Pkt Len Mean Pkt Len Std Pkt Len Var \
                    31.0
                                 7.6
                                          12.6557
  FIN Flag Cnt SYN Flag Cnt RST Flag Cnt PSH Flag Cnt ACK Flag Cnt \
                            0.0
                                         0.0
0
          0.0
                0.0
  URG Flag Cnt CWE Flag Count ECE Flag Cnt Down/Up Ratio Pkt Size Avg \
0
          0.0
                        0.0
                             0.0
                                         0.0
                                                               9.5
  Fwd Seg Size Avg Bwd Seg Size Avg Fwd Byts/b Avg Fwd Pkts/b Avg \
                   0.0
                                            0.0
              0.0
                                                          0.0
  Fwd Blk Rate Avg Bwd Byts/b Avg Bwd Pkts/b Avg Bwd Blk Rate Avg \
                            0.0
              0.0
                                                          0.0
0
  Subflow Fwd Pkts Subflow Fwd Byts Subflow Bwd Pkts Subflow Bwd Byts \
                              0.0
              1.0
                                              2.0
                                                              0.0
  Init Fwd Win Byts Init Bwd Win Byts Fwd Act Data Pkts Fwd Seg Size Min \
```

[]: x_median = np.transpose(pd.DataFrame(df1_cut.median())) #mediana dla każdej_

```
-1.0
0
                                  -1.0
                                                      0.0
                                                                        0.0
   Active Mean Active Std Active Max Active Min Idle Mean Idle Std \
0
           0.0
                      0.0
                                  0.0
                                              0.0
                                                         0.0
                                                                   0.0
   Idle Max Idle Min
0
        0.0
                 0.0
```

[]: sn.displot(df1_cut['Flow Duration'],bins=18, kde=True,aspect=2) #histogram dla_ ⇔kolumny Flow Duration

[]: <seaborn.axisgrid.FacetGrid at 0x13d1689d610>



[]: sn.displot(df1_cut['Flow Duration'],bins=18, kde=True,aspect=2, kind='hist')__

#histogram dla kolumny Flow Duration

plt.yscale('log')

#plt.xscale('log')

