NFTBull Internship Challenge - Task 2 Report

Nonfungible tokens advanced into a new financial segment which is open for illegal activities such as wash trading, money laundering etc. Wash trade is performed when a user exchanges her tokens between her wallet addresses in order to boost the asset volumes and prices in the marketplace. There exist various methods to catch this kind of activity, namely: to look for closed loop token trades, to look for closed value trades and high transaction volumes **[1]**. I chose to analyze our data for high transaction volumes. Trading volume of an NFT collection is defined as the total amount of currency exchanged between the buyer and seller in a time interval **[2]**. I tried to identify IDs of the tokens which are likely to be involved in a ill trade by examining their trading volume.

First, I calculated the transaction volume for each token, then I utilized two different statistics methods to identify outlier tokens in terms of their transaction volumes. I assumed the data has a normal distribution and calculated Z scores of the trade volumes of the tokens. When I filtered the tokens which have Z score higher than 2 and smaller than -2, I identified 15 outliers **[3]**.

When I visualized the data, I saw there is no normal distribution for the trade volumes, and actually there are more outliers than identified with the Z score. Therefore, I decided to continue with IQR (Interquartile range) which is the difference between 75^{th} and 25^{th} percentiles of the data. With this method, I identified 382 outlier tokens in the marketplace. For further analysis, as we obtain buyer and seller information of the transactions, we can examine the network of trades to identify abnormalities more elaborately.

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--Z SCORE EVALUATION--

Number of outlier tokens:  15
Outlier token IDs:
[9559, 5283, 9728, 8997, 1865, 1906, 8115, 2768, 8130, 4206, 2811, 3083, 8764, 2458, 2118]

--IQR EVALUATION--

Number of outlier tokens:  382
Outlier token IDs:
[1865, 9559, 5283, 9728, 8997, 1906, 8115, 8764, 2811, 2458, 2768, 8130, 3083, 8284, 8634, 925
4, 8007, 1098, 4952, 3790, 7658, 2777, 6118, 6901, 3082, 6462, 9652, 2118, 1385, 6291, 7346, 1
819, 9249, 1878, 3239, 3175, 712, 7510, 3092, 1277, 2815, 5600, 7385, 9647, 7646, 3163, 3478,
1879, 5384, 6545, 7048, 8851, 6731, 2727, 6590, 3205, 4345, 2693, 5498, 1422, 7767, 6455, 4440
, 5806, 9092, 3464, 4206, 4354, 1971, 1909, 5140, 5716, 3446, 8968, 1432, 7569, 7784, 7593, 43
86, 4003, 7012, 8592, 9350, 3923, 4474, 6726, 7712, 2229, 7749, 8132, 5746, 6783, 1912, 4578,
2812, 3773, 6770, 3885, 7304, 9489, 4632, 525, 5292, 6671, 1458, 8761, 5958, 7562, 6169, 1045,
6780, 5046, 8712, 7009, 2242, 8385, 6055, 1925, 6147, 7350, 8716, 4529, 2201, 1304, 2230, 6446
, 1966, 9157, 3873, 6555, 458, 8927, 8485, 2002, 4094, 8659, 2298, 6513, 1274, 2049, 8310, 836
3, 4681, 4661, 7596, 7038, 8082, 4759, 270, 9597, 5792, 2569, 4473, 9148, 7738, 8242, 2231, 44
32, 7624, 3098, 9474, 967, 5474, 7997, 1462, 699, 1562, 8891, 3479, 4962, 4426, 1269, 3292, 73
26, 4891, 9661, 8414, 9452, 6676, 7655, 6825, 4610, 8099, 9469, 2303, 1018, 3538, 1266, 3805,
5368, 7081, 6595, 8549, 6774, 7818, 344, 5154, 2932, 7412, 2894, 5479, 3966, 8365, 2463, 3488,
5550, 1983, 789, 1904, 5911, 1265, 6829, 1884, 1374, 3515, 5289, 3517, 7311, 3294, 7659, 2505,
2240, 6034, 8714, 8067, 9704, 2239, 8207, 968, 5138, 9423, 6205, 8360, 1617, 5457, 832, 1439,
4316, 1927, 4065, 138, 6655, 9286, 4707, 4865, 6301, 6826, 4388, 9411, 249, 8664, 7324, 7803,
7913, 4243, 1610, 8271, 6730, 7982, 2487, 5558, 9097, 8235, 5408, 1721, 1649, 6645, 2266, 7156
, 9804, 2793, 3491, 8708, 7998, 2622, 4208, 6949, 6421, 957, 7072, 5010, 2269, 904, 5029, 4594
, 2658, 8707, 9143, 8662, 5601, 6168, 1982, 4914, 9590, 4497, 5738, 6033, 7969, 3338, 4363, 27
47, 6679, 7483, 2945, 736, 1402, 2055, 2518, 1414, 2168, 3889, 8184, 8173, 6624, 5360, 9245, 5
71, 1747, 7175, 1582, 8364, 4685, 8366, 1672, 239, 6451, 329, 3301, 3861, 464, 4791, 6370, 572
8, 5589, 3602, 2834, 2794, 9290, 3259, 6038, 3081, 308, 8865, 2174, 7125, 7558, 8703, 5909, 60
6, 7353, 4757, 3183, 2130, 7675, 2924, 3628, 1790, 4427, 1235, 2888, 837, 847, 3946, 4849, 314
0, 9605, 9914, 3153, 4978, 6536, 4787, 4754, 3535, 658, 2967, 267, 4841, 4666, 4690, 4588, 673
7, 1334]
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References

[1] Serneels, S. (2022) "Detecting wash trading for nonfungible tokens," *Finance Research Letters*, p. 103374. Available at: https://doi.org/10.1016/j.frl.2022.103374.

[2] Editor (2022) *What is NFT Volume Trade? everything you need to know*, *The NFT Brief*. Available at: https://thenftbrief.com/nft-volume-trade/ (Accessed: December 13, 2022).

[3] Frost, J. (2021) *5 ways to find outliers in your data*, *Statistics By Jim*. Available at: https://statisticsbyjim.com/basics/outliers/ (Accessed: December 13, 2022).