AnChain.AI
Uniswap: Winning Trading Strategy Analysis

DeFi No. 1

Data-X Team 1

ANCHAIN.AI

Cryptocurrencies Help Make Millionaires

- ***Environment:*** **Market fragmentation and inefficiencies in DeFi**
- ***Need:*** **Effective trading strategies to seek investable trading opportunities**
- ***Uniswap:*** **a decentralized exchange to swap two crypto assets**

Competition

- **Manually select cryptocurrency trading strategies:** Crypto asset holders and traders make their own decisions on their judgements or through a consulting firm

- **Cryptocurrency trading products:** Crypto asset holders make exchange in a less efficient way
    1. Spot Trading:
    2. Margin Trading: leverage trading
    3. Derivatives Trading
    4. Crypto Paper Trading

Benefit

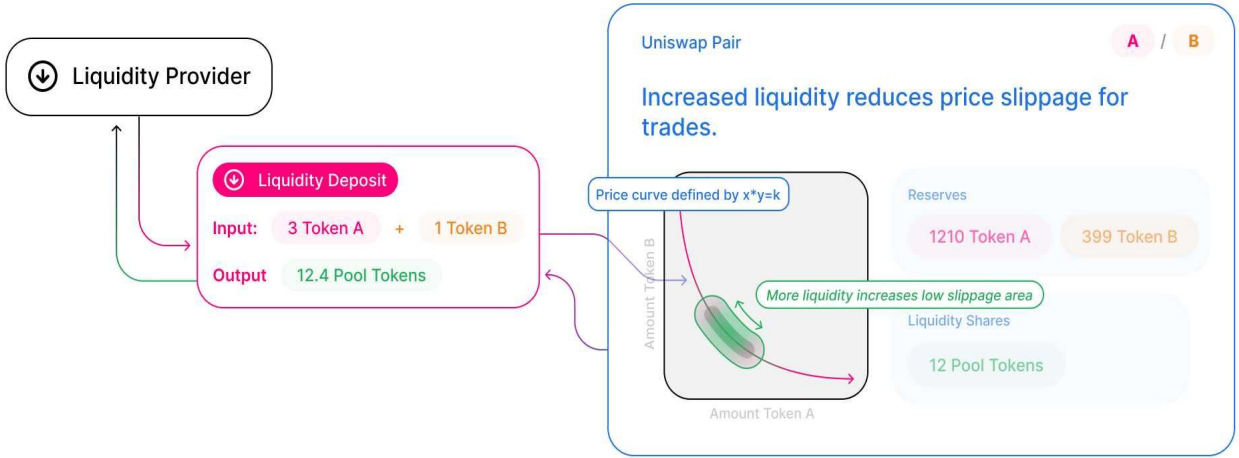
- Enhance monetary liquidity

- Provide a more secure market for crypto transactions

- Increase wining profitability based on trading strategies

Progress

- **Principles of Cryptocurrencies**
  - Stablecoins: USDT and USDC (1:1 to USD)
- **Data Acquisition & Comprehension**
  - Uniswap Platform: Programming & The x * y = k Relationship
- **Arbitrage Opportunities**
  - Arbitrage Triangles: Inequalities in Exchange Rates



Data Acquisition

All Transaction records are available in the Uniswap website

Using GraphQL to request wanted transaction data and transform into csv file

```python
if __name__ == "__main__":
    token_id_0 = "0xa0b86991c6218b36c1d19d4a2e9eb0ce3606eb48"  #USDC
    token_id_1 = "0xdac17f958d2ee523a2206206994597c13d831ec7"  #USDT
    time_left = 1613523600 #2021.2.17 - 1am
    time_right = 1614387600 #2021.2.27 - 1am
    skip = 1
    first = 200
    volume, raw_data = auto_query_uniswap(token_id_0, token_id_1, time_left, time_right, skip, first)
    if len(raw_data['data']['swaps']) >= 1:
        df_data = pd.DataFrame(raw_data['data']['swaps'])
        df_data.to_csv('sample_uniswap_record.csv', index = False)
    else:
        print('No record')
```

Sample Transaction Data

A	B	C	D	E	F	G	H	I	J	K	L	M
amount0In	amount0Out	amount1In	amount1Out	amountUSD	id	pair	sender	timestamp	to			
0	2747.997682	2745.060539	0	2746.368036	0x0011d9b6a	{'token0':	0xe069cb01	1.614E+09	0xe069cb01d06ba617bcdf789bf2ff0d5e5ca20c71			
0	358.530237	360.915368	0	359.6733741	0x00140aa00	{'token0':	0x7a250d56	1.614E+09	0x89b1251a978e88218affdf0147ffe376291f1447			
295.13	0	0	294.277619	294.6506883	0x0017b194d	{'token0':	0x043957f7	1.614E+09	0xfb609b68d694617e0100c7182f21e536760d438d			
0	3534.060641	3546.274922	0	3540.636648	0x00262f8bd	{'token0':	0x7a250d56	1.614E+09	0xe93dc496dbc669d7ee4f03b0eb0a10bb13a4b2a4			
0	4203.212925	4239.916475	0	4224.207281	0x0026dbb28	{'token0':	0xdef1c0de	1.614E+09	0x74de5d4fcbf63e00296fd95d33236b9794016631			
1807.88477	0	0	1805.336182	1805.533532	0x002eb9926	{'token0':	0x7a250d56	1.614E+09	0x6247790c324ce443a2646e62290c989490a87edd			
58166.7203	0	0	57927.91433	58017.32146	0x0030ff7dc	{'token0':	0x7a250d56	1.614E+09	0x5cf8a362e7b801d555d3155919dcbb6253d4d0fc			
1544.89948	0	0	1547.29346	1547.633583	0x00340d575	{'token0':	0x7a250d56	1.614E+09	0xff1cb86434208e07bfeeb5dc236e0631706ec333			

Arbitrage Opportunity

Bellman-Ford Algorithm:
Compute shortest path

Assuming frictionless:
Ignore transaction fee
(0.30% fee for every trade)

Collect exchange rate manually:
Not latest exchange rate

Ignore transaction size:
Price takers (no influence on current rate)

Starting with 100 in b'ETH '
b'ETH ' to b'DAI ' at 1819.000000 = 181900.000000
b'DAI ' to b'USDT' at 0.998000 = 181536.200000
b'USDT' to b'ETH ' at 0.001000 = 181.536200

Starting with 100 in b'DAI '
b'DAI ' to b'USDT' at 0.998000 = 99.800000
b'USDT' to b'ETH ' at 0.001000 = 0.099800
b'ETH ' to b'DAI ' at 1819.000000 = 181.536200

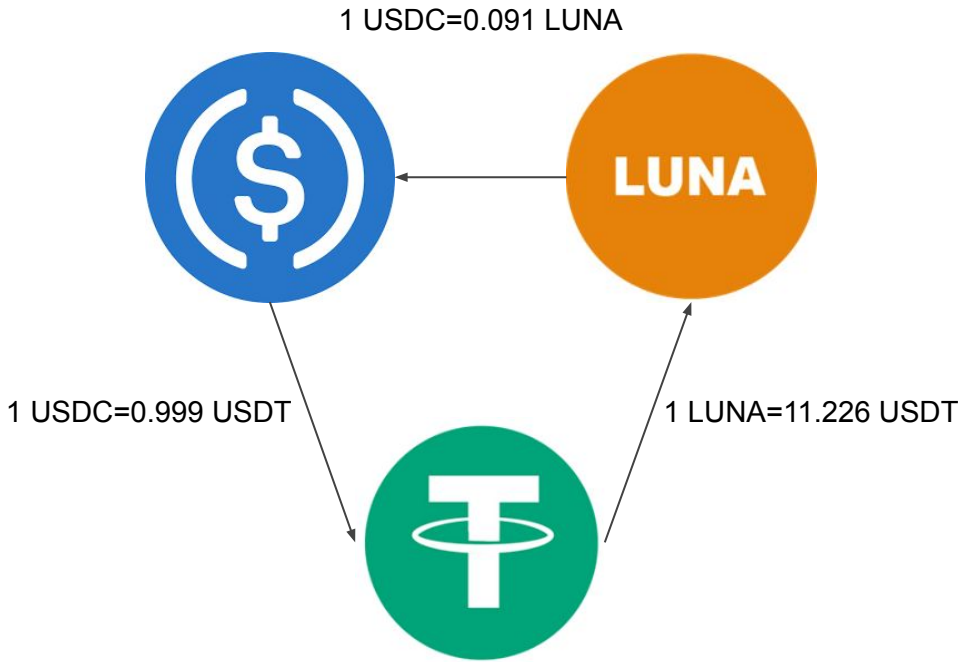
Starting with 100 in b'USDT'
b'USDT' to b'ETH ' at 0.001000 = 0.100000
b'ETH ' to b'DAI ' at 1819.000000 = 181.900000
b'DAI ' to b'USDT' at 0.998000 = 181.536200

```
# 0310 9:10pm–9:17pm

Rate={
   "WBTC_ETH ":30.316 , "ETH _WBTC":  0.033,
   "USDC_ETH ":0.001 , "ETH _USDC":1826 ,
   "ETH _USDT": 1832, "USDT_ETH ": 0.001,
   "RAI _ETH ":0.002, "ETH _RAI ":613.232,
   "UNI _ETH ":0.017, "ETH _UNI ":57.417 ,
   "DAI _ETH ": 0.001, "ETH _DAI ": 1819,
   "HKMT_USDT":0.127 , "USDT_HKMT": 7.87,
   "LINK_ETH ":0.017 , "ETH _LINK": 59.861,
   "FRAX_USDC": 1.001 , "USDC_FRAX":0.999,
   "CORE_ETH ":2.778, "ETH _CORE":0.36 ,
   "DPI _ETH ":0.256 , "ETH _DPI ":3.914 ,
   "USDC_USDT":1.003, "USDT_USDC":0.997,
   "BOND_USDC":65.949 , "USDC_BOND": 0.015,
   "LON _ETH ": 0.003 , "ETH _LON ": 292.087,
   "FRAX_ETH ":0.001 , "ETH _FRAX" : 1816 ,
   "AAVE_ETH ":0.234 , "ETH _AAVE" :4.272 ,
   "ETH _HEZ ":  312.188, "HEZ _ETH ": 0.003,
   "BAC _DAI ": 0.431 , "DAI _BAC " :2.319 ,
   "MKR _ETH ":1.218 , "ETH _MKR ":0.821,
   "ETH _BDP ": 573.993, "BDP _ETH ":0.002,
   "DAI _HOPR ":1.422 , "HOPR_DAI ":0.703,
   "EXRD_USDC":0.166 , "USDC_EXRD":6.021,
   "DAI _USDC ":1.001 , "USDC_DAI ":0.999,
   "POLS_ETH ":0.002 , "ETH _POLS": 421.769,
   "AMPL_ETH ": 0.001 , "ETH _AMPL": 1808,
   "UST _USDT":1.009, "USDT_UST ":0.991,
   "XOR _ETH ": 0.31, "ETH _XOR ": 3.225,
   "DOLA_ETH ":0.001, "ETH _DOLA":1816,
   "ETH _WPE ":0.496  , "WPE _ETH ":2.017,
   "DAI _USDT ":0.998 , "USDT_DAI ":1.002 ,
   "EVN _ETH ":0.051 , "ETH _EVN ":19.725,
   "USDC_EURS":0.834, "EURS_USDC": 1.199
}
```

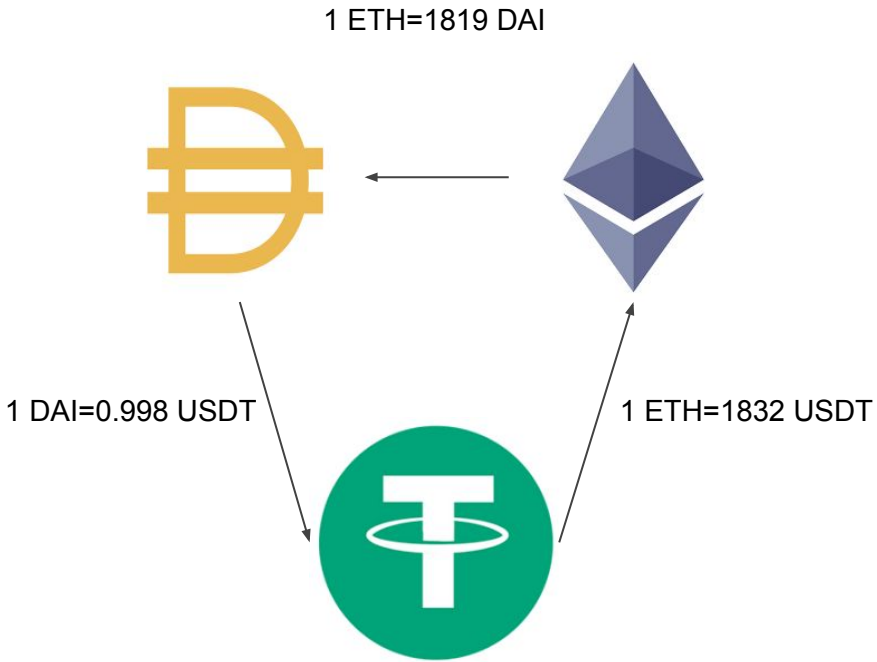
Arbitrage Opportunity

Mar. 9, 18pm



100 USDT → 102.2566 USDT
Profit: +2.2566 USDT

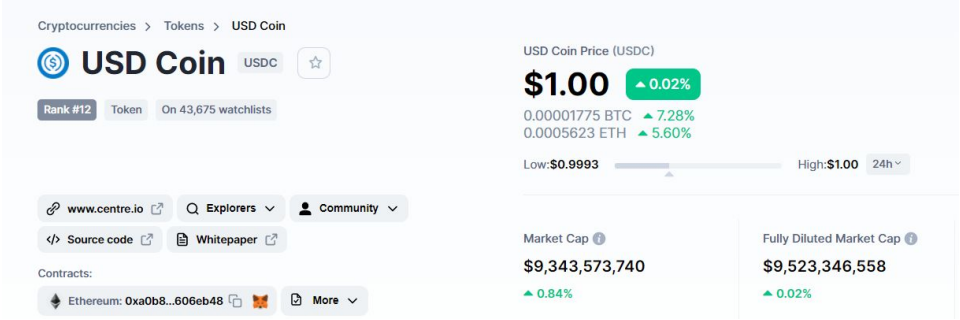
Mar. 10, 21:10pm



100 USDT → 181.5362 USDT
Profit: +81.5362 USDT

Related Potential Chances

1.Stablecoins are cryptocurrencies designed to minimize the volatility of the price of the stablecoin, relative to some "stable" asset or basket of assets.



Small Fluctuations in Stablecoins

Large Arbitrage Opportunities

Next Plans

- Data Analysis (next 1 week):
  - Exploring patterns the time before or after arbitrage opportunities occurred through transaction dataset
  - Finding outlier in transaction (e.g abnormal large exchange quantity, fixed transaction time intervals, etc.)
- Algorithm Application (next 1-2 weeks):
  - Identifying the symbols which indicated the occurrence of arbitrage and given prediction result
  - Regression models for exchange rate prediction / Transfer learning models for common patterns of winning strategies
- Mechanism Research (advanced):
  - Confirming what features affect the profit (e.g. transaction fee, quantity limitation, etc.)

Thank you for your listening

Q & A