thegraph_data_access

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1 TheGraph data access

courtesty of @markusbkoch submitted by @mzargham

[1]:

```
import pandas as pd
import json
import requests
import matplotlib.pyplot as plt
url = 'https://api.thegraph.com/subgraphs/name/balancer-labs/balancer'
query = '''
query {{
    pools(first: 1000, skip:{}) {{
        id
        liquidity
    }}
}}'''
n = 0
pools = []
while True:
    print(f'request {n+1}')
    v= query.format(n*1000)
    print(v)
    r = requests.post(url, json = {'query':v})
    p = json.loads(r.content)['data']['pools']
    print(f'results {len(p)}')
    pools.extend(p)
    print(f'total {len(pools)}')
    n += 1
    if len(p) < 1000:
        break
subgraph_tvl = pd.DataFrame(pools)
```

```
request 1

query {
    pools(first: 1000, skip:0) {
        id
        liquidity
    }
}
results 1000
total 1000
request 2

query {
    pools(first: 1000, skip:1000) {
        id
        liquidity
    }
}
results 1000
total 2000
request 3

query {
    pools(first: 1000, skip:2000) {
        id
        liquidity
    }
}
results 983
total 2983
```

[2]:

```
subgraph_tvl.head()
```

[2]:

```
                                           id  \
0  0x002ad19fb25c6206d6d19e524f363ea846afe4a5
1  0x002d3737e074fb4521036f2c41beba05d221ba69
2  0x003a70265a3662342010823bea15dc84c6f7ed54
3  0x004e74ff81239c8f2ec0e2815defb970f3754d86
4  0x0077732357ac0f29e26ea629b79ab3b266ddb796

                             liquidity
0    3134204.04112601389040661046924415
1                                     0
2   1607010.195858511381074854154746278
3    680.928486911431236447041487663722
4  0.8653140420464888814426818591183125
```

Dealing with pagination here is a pain and the **query** string above does not actually run in the explorer as written. In order to make it easier to move back and forth between the explorer and the python environment we should build a function to run the same query we use in the explorer, for example:

```
{pools(first:1000){
        id
```

```
            liquidity
        }
    }
```

[3]:

```
def query_theGraph(raw_query, field_name, url, verbose=False, hardcap=5000):

    query_parts =raw_query.split(')')
    paginator = ", skip:{}"
    #this expectes the raw query to gave a `first:1000` term
    n = 0
    records = []
    while True:
        print(f'request {n+1}')
        skipper = paginator.format(n*1000)
        query = 'query '+query_parts[0]+skipper+')'+query_parts[1]

        if verbose:
            print(query)

        r = requests.post(url, json = {'query':query})

        try:
            d = json.loads(r.content)['data'][field_name]
        except:
            #print(r.content)
            errors = json.loads(r.content)['errors']
            #print(errors)
            for e in errors:
                print(e['message'])

        print(f'results {len(d)}')
        records.extend(d)
        print(f'total {len(records)}')

        if n*1000>hardcap:
            break

        n += 1
        if len(d) < 1000:
            break

    return pd.DataFrame(records)
```

[4]:

```
raw_query = '''{pools(first:1000){
        id
        liquidity
    }
}

'''
field_name = 'pools'

subgraph_tvl2 = query_theGraph(raw_query, field_name, url, True)
```

```
request 1
query {pools(first:1000, skip:0){
        id
        liquidity
    }
}


results 1000
total 1000
request 2
query {pools(first:1000, skip:1000){
        id
        liquidity
    }
}


results 1000
total 2000
request 3
query {pools(first:1000, skip:2000){
        id
        liquidity
    }
}


results 983
total 2983
```

[5]:

```
subgraph_tvl2
```

[5]:

```
                                              id  \
0     0x002ad19fb25c6206d6d19e524f363ea846afe4a5
1     0x002d3737e074fb4521036f2c41beba05d221ba69
2     0x003a70265a3662342010823bea15dc84c6f7ed54
3     0x004e74ff81239c8f2ec0e2815defb970f3754d86
4     0x0077732357ac0f29e26ea629b79ab3b266ddb796
…                                           …
```

```
2978  0xffe8c31fb0ab62c99fc6e8c724d0f1949dbaa44f
2979  0xfff293e1f6c174867f23351c1510833c8087fecb
2980  0xfff29c8bce4fbe8702e9fa16e0e6c551f364f420
2981  0xfff2a5f81d14729408201341df42af29f3b30458
2982  0xfff82910d352abe04d00d542f0ded0bfc8516f78

                                 liquidity
0       3134204.04112601389040661046924415
1                                        0
2      1607010.195858511381074854154746278
3       680.928486911431236447041487663722
4     0.865314042046488881442681859183125
…                                     …
2978   2456.326310481351067036022529611443
2979                                     0
2980                                     0
2981   4803257.687680420723710346823791984
2982                                     0

[2983 rows x 2 columns]
```

[6]:

```
subgraph_tvl2.head()
```

[6]:

```
                                           id  \
0  0x002ad19fb25c6206d6d19e524f363ea846afe4a5
1  0x002d3737e074fb4521036f2c41beba05d221ba69
2  0x003a70265a3662342010823bea15dc84c6f7ed54
3  0x004e74ff81239c8f2ec0e2815defb970f3754d86
4  0x0077732357ac0f29e26ea629b79ab3b266ddb796

                              liquidity
0    3134204.04112601389040661046924415
1                                     0
2   1607010.195858511381074854154746278
3    680.928486911431236447041487663722
4  0.865314042046488881442681859183125
```

[7]:

```
subgraph_tvl2.columns = ['id','liquidity2']
```

[8]:

```
checker = subgraph_tvl.merge(subgraph_tvl2)
```

[9]:

```
checker['matches'] = checker.liquidity==checker.liquidity2
```

[10]:

```
checker.matches.describe()
```

[10]:

```
count     2983
unique       1
```

```
top       True
freq      2983
Name: matches, dtype: object
```

Now that have checked the data we can proceed with some exploratory analysis.

[11]:
```
subgraph_tvl.liquidity= subgraph_tvl.liquidity.apply(float)
```

[12]:
```
subgraph_tvl.sort_values('liquidity', inplace=True)
```

[13]:
```
subgraph_tvl.liquidity
```

[13]:
```
1491    0.000000e+00
1732    0.000000e+00
1730    0.000000e+00
1729    0.000000e+00
1728    0.000000e+00
            …
1083    6.912330e+07
1631    8.049854e+07
1063    2.636881e+08
2302    3.192996e+08
368     3.462288e+08
Name: liquidity, Length: 2983, dtype: float64
```

[14]:
```
plt_df=subgraph_tvl[subgraph_tvl.liquidity>1].copy().sort_values('liquidity',␣
 ↪ascending=False)
```

[15]:
```
subgraph_tvl.describe()
```

[15]:
```
          liquidity
count  2.983000e+03
mean   6.799800e+05
std    1.033555e+07
min    0.000000e+00
25%    0.000000e+00
50%    0.000000e+00
75%    5.593942e+02
max    3.462288e+08
```

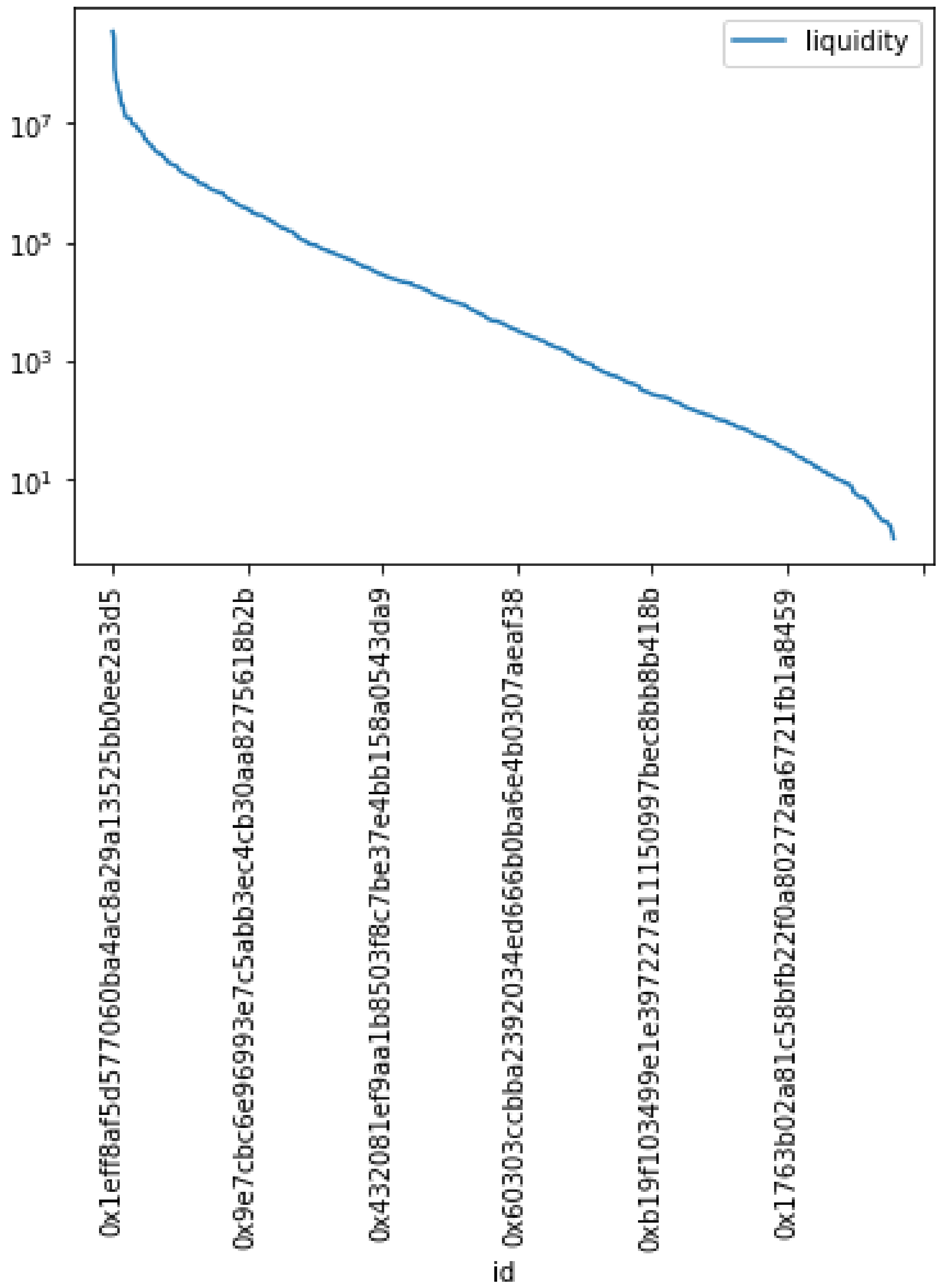
[16]:
```
plt_df.tail()
```

[16]:
```
                                              id  liquidity
342   0x1d261ec7ab834fedb01602c5b7ffc6fc68362bbf   1.577654
991   0x53f160490d7e48ba2c31be4790f3d87a2f4dc662   1.371422
1857  0x9e4a4b53e19410ae519be74f92659e5b0ef9489b   1.330313
2365  0xcb8ec8236aff8e112517f4e9a9ffb413a237e6b7   1.153105
```

```
1302  0x6d42692518c8b09c883e7c1e69c97518107f2185   1.030083
```

[17]:
```
plt_df.plot(x='id', y='liquidity', logy=True)
plt.xticks(rotation=90)
```

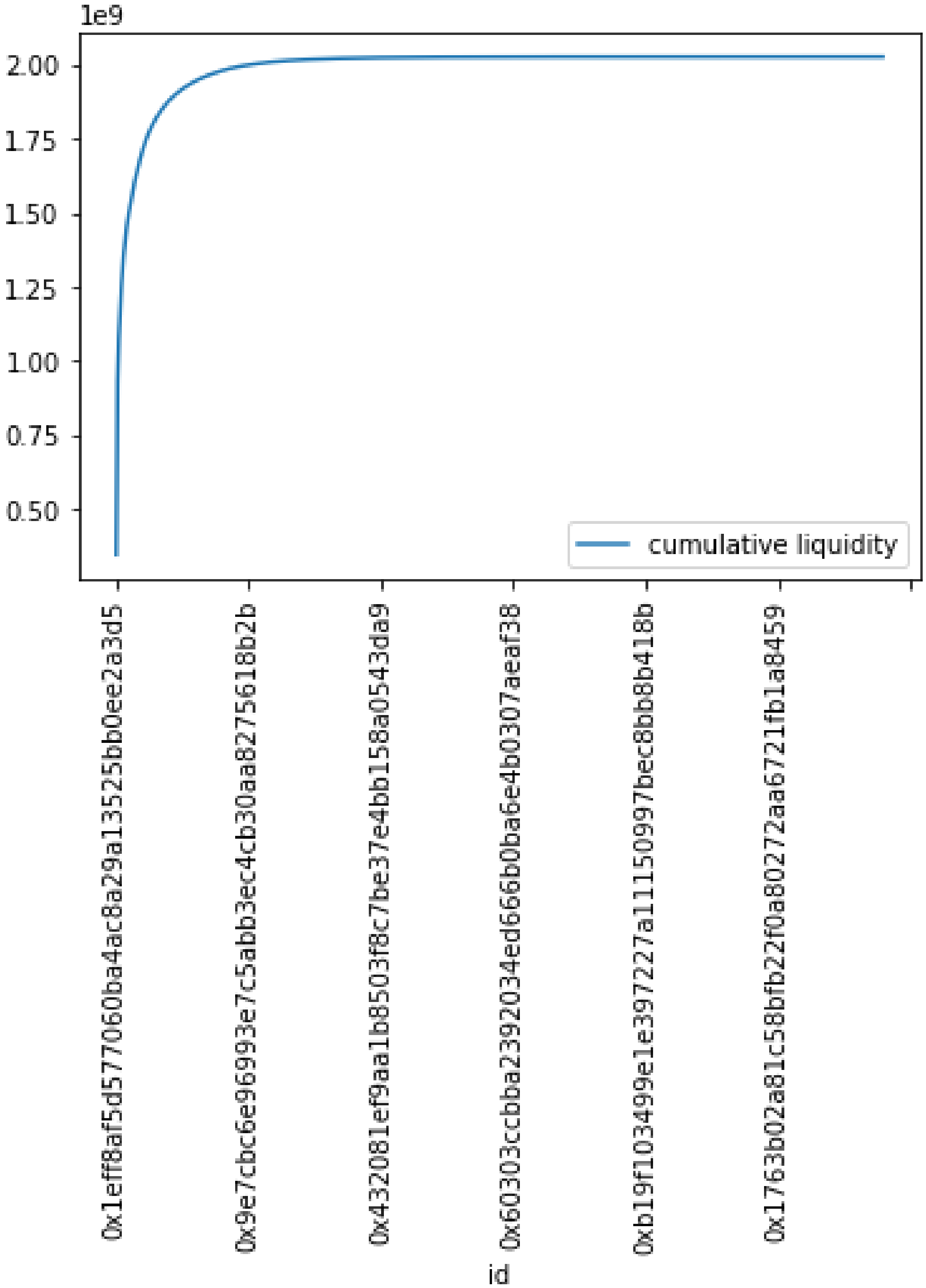
[17]:
```
(array([-200.,    0.,  200.,  400.,  600.,  800., 1000., 1200., 1400.]),
 [Text(-200.0, 0, '0x3e7356c713a9043d0efac4d9b4e2d993d2e62a79'),
  Text(0.0, 0, '0x1eff8af5d577060ba4ac8a29a13525bb0ee2a3d5'),
  Text(200.0, 0, '0x9e7cbc6e96993e7c5abb3ec4cb30aa8275618b2b'),
  Text(400.0, 0, '0x432081ef9aa1b8503f8c7be37e4bb158a0543da9'),
  Text(600.0, 0, '0x60303ccbba2392034ed666b0ba6e4b0307aeaf38'),
  Text(800.0, 0, '0xb19f103499e1e397227a11150997bec8bb8b418b'),
  Text(1000.0, 0, '0x1763b02a81c58bfb22f0a80272aa6721fb1a8459'),
  Text(1200.0, 0, ''),
  Text(1400.0, 0, '')])
```



[18]:
```
plt_df['cumulative liquidity'] = plt_df.liquidity.cumsum()
```

[19]:
```
plt_df.plot(x='id', y='cumulative liquidity', logy=False)
plt.xticks(rotation=90)
```

```
[19]: (array([-200.,    0.,  200.,  400.,  600.,  800., 1000., 1200., 1400.]),
       [Text(-200.0, 0, '0x3e7356c713a9043d0efac4d9b4e2d993d2e62a79'),
        Text(0.0, 0, '0x1eff8af5d577060ba4ac8a29a13525bb0ee2a3d5'),
        Text(200.0, 0, '0x9e7cbc6e96993e7c5abb3ec4cb30aa8275618b2b'),
        Text(400.0, 0, '0x432081ef9aa1b8503f8c7be37e4bb158a0543da9'),
        Text(600.0, 0, '0x60303ccbba2392034ed666b0ba6e4b0307aeaf38'),
        Text(800.0, 0, '0xb19f103499e1e397227a11150997bec8bb8b418b'),
        Text(1000.0, 0, '0x1763b02a81c58bfb22f0a80272aa6721fb1a8459'),
        Text(1200.0, 0, ''),
        Text(1400.0, 0, '')])
```


1e9
2.00
1.75
1.50
1.25
1.00
0.75
0.50
cumulative liquidity
0x1eff8af5d577060ba4ac8a29a135525bb0ee2a3d5
0x9e7cbc6e96993e7c5abb3ec4cb30aa8275618b2b
0x432081ef9aa1b8503f8c7be37e4bb158a0543da9
0x60303ccbba2392034ed666b0ba6e4b0307aeaf38
0xb19f103499e1e397227a111509997bec8bb8b418b
0x1763b02a81c58bfb22f0a802772aa6721fb1a8459
id

[ ]:

[ ]: