group_project_01

May 5, 2022

0.1 Import dependancies

```
[1]: # Import dependancies
import os
import requests
import pandas as pd
import json
from dotenv import load_dotenv
from etherscan_py import etherscan_py
import plotly.express as px
```

```
[2]: # Loading .env containing our keys
load_dotenv()
```

```
[2]: True
```

```
[3]: # create variable for api key
api_key = os.getenv('COVALENT_API_KEY')
type(api_key)
```

```
[3]: str
```

0.2 Current value of ETH

```
[4]: # import dependancy
from etherscan_py import etherscan_py
etherscan_api = etherscan_py.Client(os.getenv('ETHERSCAN_API'))

# Print current eth price and latest block height
eth_value = etherscan_api.get_eth_price()
eth_value
```

```
[4]: 2738.51
```

0.3 Set variables

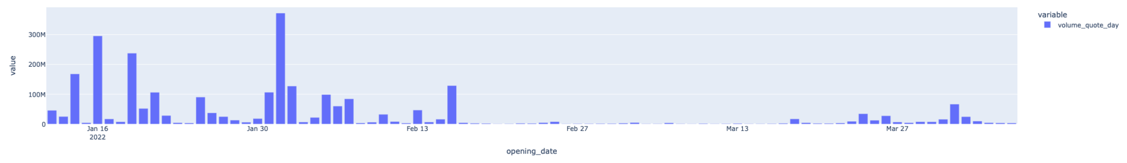
[5]:
```
# Append url for our api
url = "https://api.covalenthq.com/v1"
chain_id = "/1"
azuki_address = "/0xED5AF388653567Af2F388E6224dC7C4b3241C544"
cryptopunks_address = "/0xb47e3cd837dDF8e4c57F05d70Ab865de6e193BBB"
BAYC_address = "/0xBC4CA0EdA7647A8aB7C2061c2E118A18a936f13D"
date_option = '/?quote-currency=USD&format=JSON&from=2017-01-01&to=2022-05-01'
page_option = '/transactions_v2/?
 ↪quote-currency=USD&format=JSON&block-signed-at-asc=false&no-logs=false&page-number=0&page-s
api_option = "&key=" + api_key
api_no_option = '/?key=' + api_key
```

0.4 1. Azuki Daily Volume

[6]:
```
# Create variables needed for owner data and add to url
azuki_url = url + chain_id + "/nft_market/collection" + azuki_address +␣
 ↪api_no_option

# Get request
azuki_historical_json = requests.get(azuki_url).json()

# Convert historical json data to a dataframe and view data
azuki_df = pd.DataFrame(azuki_historical_json['data']['items'])

# Set index to date
azuki_df = azuki_df.set_index('opening_date')

# Create Volume dataframe
azuki_vol_df = pd.DataFrame(azuki_df, columns = ['volume_quote_day',␣
 ↪'unique_token_ids_sold_count_day']).sort_index()
azuki_vol_df.head()
```

[6]:
```
              volume_quote_day  unique_token_ids_sold_count_day
opening_date
2022-01-12          45941404.0                             2402
2022-01-13          25129178.0                             1318
2022-01-14         168151840.0                              470
2022-01-15           4408686.0                              499
2022-01-16         295638336.0                              368
```

[7]:
```
# Plot Volume quote per day
azuki_volume = azuki_vol_df['volume_quote_day'].astype(int)

# Plot Historical daily volume
px.bar(azuki_volume)
```



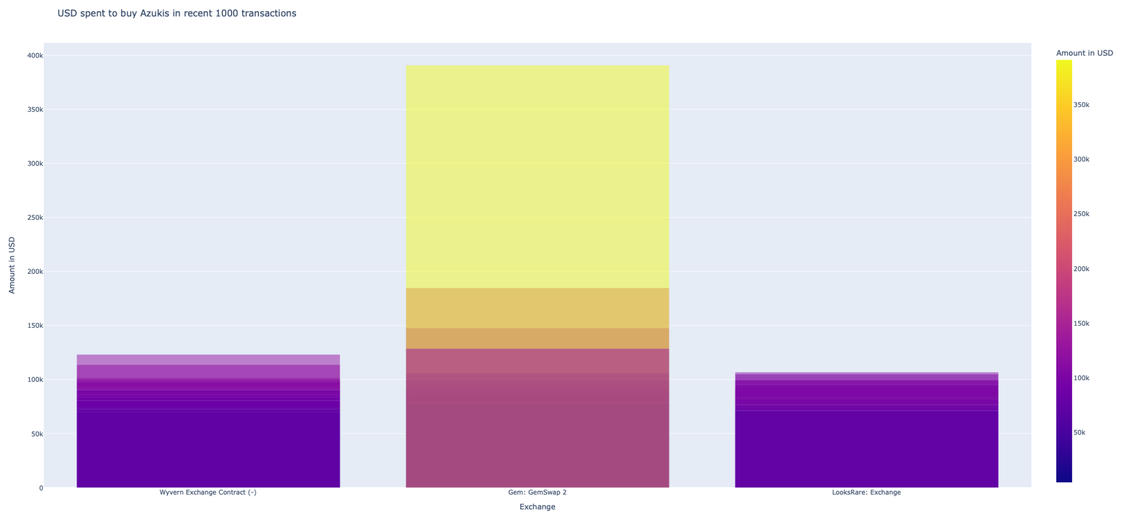
0.5 1. Azuki Historical transactions

[8]:
```
# Quering the API for transaction data
azuki_tx_url = url + chain_id + "/address" + azuki_address + page_option +␣
 ↪api_option
azuki_tx = requests.get(azuki_tx_url).json()

# Convert transactions data to dataframe
azuki_tx_df = pd.DataFrame(azuki_tx['data']['items'], columns =␣
 ↪['to_address_label','fees_paid', 'value_quote','block_signed_at']).
 ↪set_index('block_signed_at').sort_index()

azuki_tx_df.head()
```

[8]:
```
                        to_address_label          fees_paid   value_quote
block_signed_at
2022-05-02T18:43:51Z  LooksRare: Exchange  22370093235357597      0.000000
2022-05-02T18:47:06Z                 None   2448400799338417      0.000000
2022-05-02T18:49:48Z                 None   5009529942416780      0.000000
2022-05-02T18:54:24Z                 None   5166370935350339      0.000000
2022-05-02T19:06:28Z                 None  18519456263386155  86919.574609
```

0.6 1.a Azuki Historical Sales

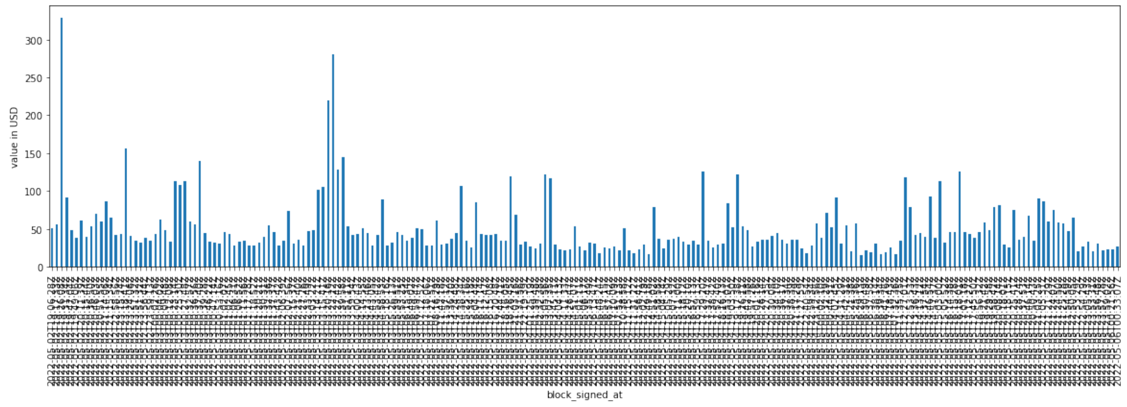
[9]:
```
# Filter Through data for non null transactions
azuki_sales_df = azuki_tx_df[azuki_tx_df['value_quote'] != 0]
azuki_sales = azuki_sales_df[azuki_sales_df['to_address_label'].notnull()]

# Creating the plot using plotly express
azuki_fig = px.bar(azuki_sales,
                   x='to_address_label',
                   y= 'value_quote',
                   color='value_quote',
                   height=1020,
                   width = 1000,
                   barmode='overlay',
                   labels={'value_quote':'Amount in USD', 'to_address_label':␣
 ↪'Exchange'},
                   title='USD spent to buy Azukis in recent 1000 transactions'
                  )
azuki_fig.show()
```



0.7 1.b Azuki transaction fees paid

[10]:
```
# Filter Through data for non null transactions
azuki_fees = azuki_sales_df['fees_paid'].astype(int)/10**18*eth_value

azuki_fees.plot.bar(rot = 90, figsize = (20,5), ylabel = 'value in USD')
```

[10]:
```
<AxesSubplot:xlabel='block_signed_at', ylabel='value in USD'>
```

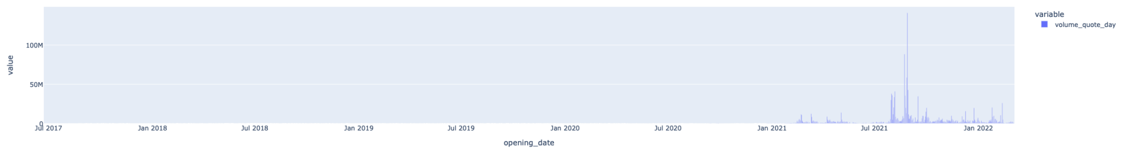


0.8 2. Cryptopunks Daily Volume

[11]:
```
# Create variables needed for owner data and append to url
cryptopunks_historical_url = url + chain_id + "/nft_market/collection" +␣
 ↪cryptopunks_address + api_no_option

# Get request
cryptopunks_historical_json = requests.get(cryptopunks_historical_url).json()

# Convert historical json data to a dataframe and view data
cryptopunks_df = pd.DataFrame(cryptopunks_historical_json['data']['items'])

# Set index to date
cryptopunks_df = cryptopunks_df.set_index('opening_date')

# Create Volume dataframe
cryptopunks_vol_df = pd.DataFrame(cryptopunks_df, columns =␣
 ↪['volume_quote_day', 'unique_token_ids_sold_count_day']).sort_index()
cryptopunks_vol_df.head()
```

[11]:
```
              volume_quote_day  unique_token_ids_sold_count_day
opening_date
2017-06-23                 0.0                               19
2017-06-24                 0.0                               22
2017-06-25                 0.0                               11
2017-06-26                 0.0                               18
2017-06-27                 0.0                               35
```

[12]:
```
# Plot Volume quote per day
cryptopunks_volume = cryptopunks_vol_df['volume_quote_day'].astype(int)

# cryptopunks_volume.plot.line(figsize = (20,4))

px.bar(cryptopunks_volume)
```



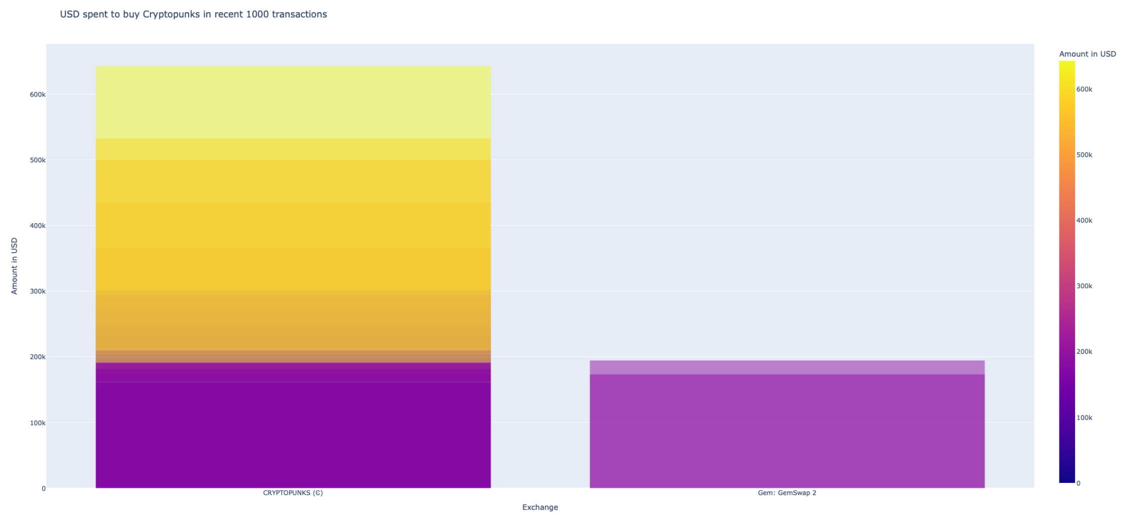
0.9 2a Cryptopunks Historical transactions

```
[13]: # Quering the API for transaction data
cryptopunks_tx_url = url + chain_id + "/address" + cryptopunks_address +␣
 ↪page_option + api_option
cryptopunks_tx = requests.get(cryptopunks_tx_url).json()

# Convert transactions data to dataframe
cryptopunks_tx_df = pd.DataFrame(cryptopunks_tx['data']['items'], columns =␣
 ↪['to_address_label','fees_paid', 'value_quote','block_signed_at']).
 ↪set_index('block_signed_at').sort_index()

cryptopunks_tx_df.head()
```

```
[13]:                      to_address_label           fees_paid    value_quote
block_signed_at
2022-04-27T17:46:26Z  CRYPTOPUNKS ( )   5901776729714157       0.000000
2022-04-27T17:48:18Z              None  28932221174799876       0.000000
2022-04-27T17:53:12Z  CRYPTOPUNKS ( )   6838075277247300  174127.151367
2022-04-27T17:59:35Z  CRYPTOPUNKS ( )   4845298000000000  182552.658691
2022-04-27T18:00:07Z  CRYPTOPUNKS ( )   1797562348480696       0.000000
```

0.10 2.a Cryptopunks Historical Sales

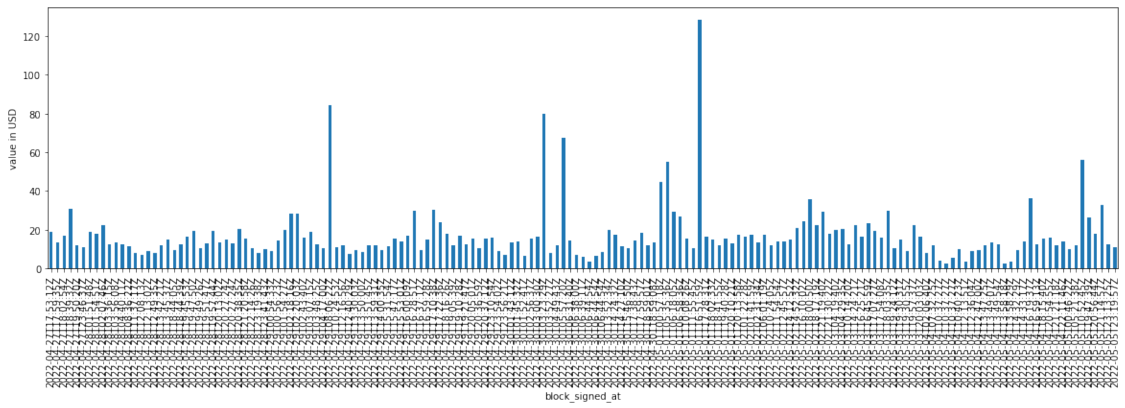
```
[14]: # Filter Through data for non null transactions
cryptopunks_sales_df = cryptopunks_tx_df[cryptopunks_tx_df['value_quote'] != 0]
cryptopunks_sales =␣
 ↪cryptopunks_sales_df[cryptopunks_sales_df['to_address_label'].notnull()].
 ↪dropna()



# Creating the plot using plotly express
cryptopunks_fig = px.bar(cryptopunks_sales,
                         x='to_address_label',
                         y= 'value_quote',
                         color='value_quote',
                         height=1020,
                         width = 1000,
                         barmode = 'overlay',
                         labels={'value_quote':'Amount in USD',␣
 ↪'to_address_label': 'Exchange'},
                         title='USD spent to buy Cryptopunks in recent 1000␣
 ↪transactions'
                        )
cryptopunks_fig.show()
```



0.11 2.b Cryptopunks Fees paid

[15]:
```
# Filter Through data for non null transactions
cryptopunks_fees = cryptopunks_sales_df['fees_paid'].astype(int)/
↪10**18*eth_value

cryptopunks_fees.plot.bar(rot = 90, figsize = (20,5), ylabel = 'value in USD')
```

[15]:
```
<AxesSubplot:xlabel='block_signed_at', ylabel='value in USD'>
```

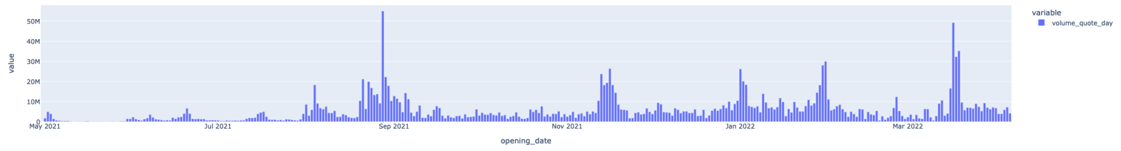


0.12 3. BAYC Daily Volume

[16]:
```python
# Create variables needed for owner data and add to url
BAYC_historical_url = url + chain_id + "/nft_market/collection" + BAYC_address␣
 ↪+ api_no_option

# Get request
BAYC_historical_json = requests.get(BAYC_historical_url).json()

# Convert historical json data to a dataframe and view data
BAYC_df = pd.DataFrame(BAYC_historical_json['data']['items'])

# Set index to date
BAYC_df = BAYC_df.set_index('opening_date')

# Create Volume dataframe
BAYC_vol_df = pd.DataFrame(BAYC_df, columns = ['volume_quote_day',␣
 ↪'unique_token_ids_sold_count_day']).sort_index()
BAYC_vol_df.head()
```

[16]:
```
              volume_quote_day  unique_token_ids_sold_count_day
opening_date
2021-04-30        8.241964e+02                                1
2021-05-01        1.737182e+06                             1635
2021-05-02        4.950946e+06                             1534
2021-05-03        3.948996e+06                              996
2021-05-04        1.388962e+06                              336
```

[17]:
```python
# Plot Volume quote per day
BAYC_volume = BAYC_vol_df['volume_quote_day'].astype(int)

# BAYC_volume.plot.bar(figsize = (20,4))
px.bar(BAYC_volume)
```

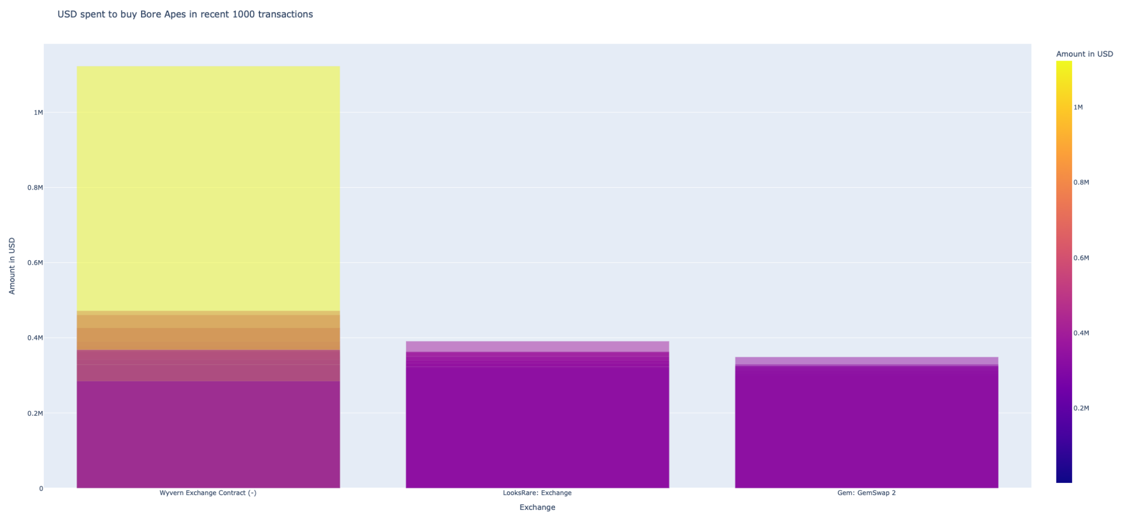


0.13 3a BAYC Historical Sales

[18]:
```
# Quering the API for transaction data
BAYC_tx_url = url + chain_id + "/address" + BAYC_address + page_option +␣
↪api_option
BAYC_tx = requests.get(BAYC_tx_url).json()

# Convert transactions data to dataframe
BAYC_tx_df = pd.DataFrame(BAYC_tx['data']['items'], columns =␣
↪['to_address_label','fees_paid', 'value_quote','block_signed_at']).
↪set_index('block_signed_at').sort_index()

BAYC_tx_df.head()
```

[18]:
```
                                  to_address_label          fees_paid  \
block_signed_at
2022-05-02T20:37:49Z                          None  807538685852447 70
2022-05-02T20:44:31Z  Wyvern Exchange Contract (-)  190524439877850 43
2022-05-02T20:50:02Z                          None  113886949372497 59
2022-05-02T20:55:00Z                          None  179550723679556 40
2022-05-02T20:55:32Z                          None   44499371674097 60

                      value_quote
block_signed_at
2022-05-02T20:37:49Z      0.00000
2022-05-02T20:44:31Z 303074.83252
2022-05-02T20:50:02Z      0.00000
2022-05-02T20:55:00Z      0.00000
2022-05-02T20:55:32Z      0.00000
```

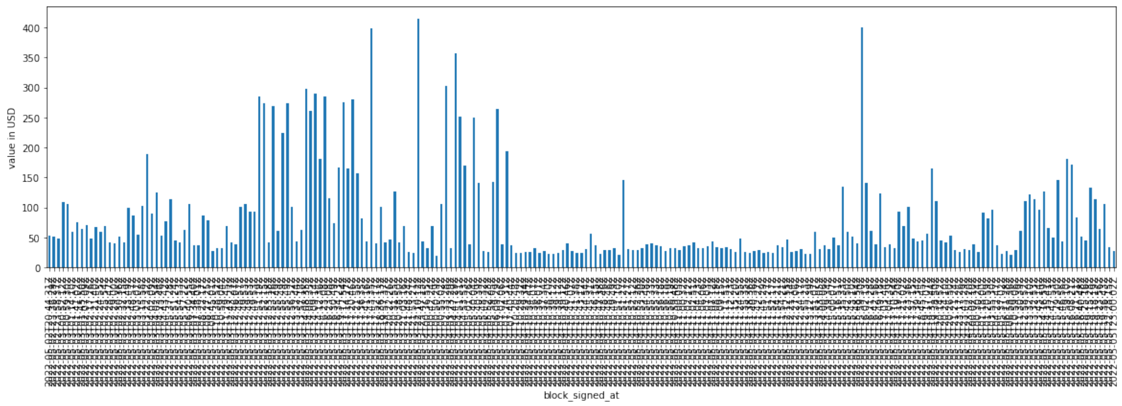
[19]:
```
# Filter Through data for non null transactions
BAYC_sales_df = BAYC_tx_df[BAYC_tx_df['value_quote'] != 0]
BAYC_sales = BAYC_sales_df[BAYC_sales_df['to_address_label'].notnull()].dropna()

# Creating the plot using plotly express
BAYC_fig = px.bar(BAYC_sales,
             x='to_address_label',
             y= 'value_quote',
             color='value_quote',
             height=1020,
             width = 1000,
                  barmode = 'overlay',
                  labels={'value_quote':'Amount in USD', 'to_address_label':␣
↪'Exchange'},
             title='USD spent to buy Bore Apes in recent 1000 transactions'
            )
BAYC_fig.show()
```



0.14 3.b BAYC Fees paid

[20]:
```python
# Filter Through data for non null transactions
BAYC_fees = BAYC_sales_df['fees_paid'].astype(int)/10**18*eth_value

BAYC_fees.plot.bar(rot = 90, figsize = (20,5), ylabel = 'value in USD')
```

[20]:
```
<AxesSubplot:xlabel='block_signed_at', ylabel='value in USD'>
```



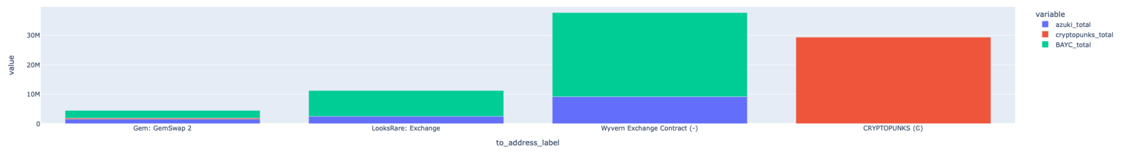
0.15 Combine Total Sales

[21]:
```python
# Group by address label and sum the value
azuki_total = azuki_sales.groupby('to_address_label').sum()
cryptopunks_total = cryptopunks_sales.groupby('to_address_label').sum()
```

```
BAYC_total = BAYC_sales.groupby('to_address_label').sum()
```

[22]:
```
# Combine and rename columns for our total sales data
combined_totals = pd.concat([azuki_total,cryptopunks_total,BAYC_total], axis=1)
combined_totals.columns = ['azuki_total', 'cryptopunks_total','BAYC_total']
```

[23]:
```
# Plot for combined figure
combined_total_fig = px.bar(combined_totals)


# Show Figure
combined_total_fig.show()
```



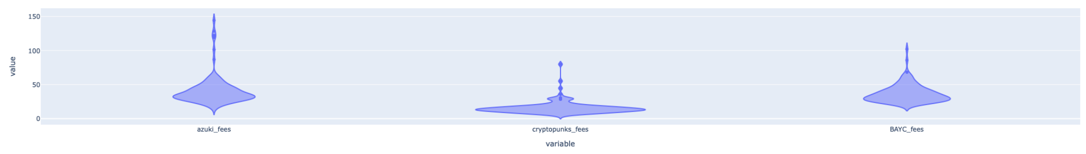
0.16 Combine Total Fees

[24]:
```
# Group by address label and sum the value
combined_totals
```

[24]:
```
                              azuki_total  cryptopunks_total    BAYC_total
to_address_label
Gem: GemSwap 2               1.494632e+06       3.683260e+05  2.568193e+06
LooksRare: Exchange          2.452695e+06                NaN  8.755434e+06
Wyvern Exchange Contract (-) 9.148483e+06                NaN  2.856156e+07
CRYPTOPUNKS ( )                       NaN       2.937500e+07           NaN
```

[25]:
```
# Combine and rename columns for our total sales data
azuki_usd_fees = azuki_sales['fees_paid'].astype(int)/10**18*eth_value
cryptopunks_usd_fees = cryptopunks_sales['fees_paid'].astype(int)/
 ↪10**18*eth_value
BAYC_usd_fees = BAYC_sales['fees_paid'].astype(int)/10**18*eth_value

# Combine dataframe and drop nulls
combined_usd_fees = pd.concat([azuki_usd_fees.reset_index(drop=True),
                               cryptopunks_usd_fees.reset_index(drop=True),
                               BAYC_usd_fees.reset_index(drop=True)],
                              axis=1
                             ).dropna()
combined_usd_fees.columns = ['azuki_fees', 'cryptopunks_fees','BAYC_fees']
```

[26]:
```
# Plot for combined figure
combined_fees_fig = px.violin(combined_usd_fees)

# Show Figure
combined_fees_fig.show()
```


value
azuki_fees
cryptopunks_fees
BAYC_fees
variable