

# 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 dependency
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-size=100'
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')

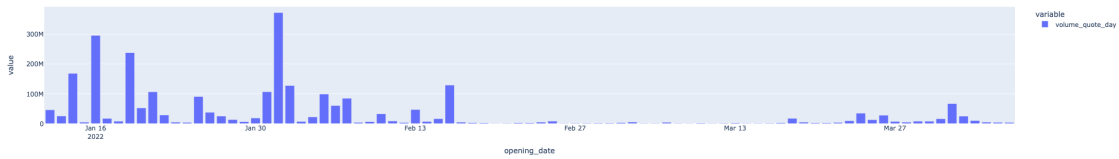
# Create Volume dataframe
azuki_vol_df = pd.DataFrame(azuki_df, columns = ['volume_quote_day', 'unique_token_ids_sold_count_day']).sort_index()
azuki_vol_df.head()
```

```
[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]: # Querying 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]:
```

block_signed_at	to_address_label	fees_paid	value_quote
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

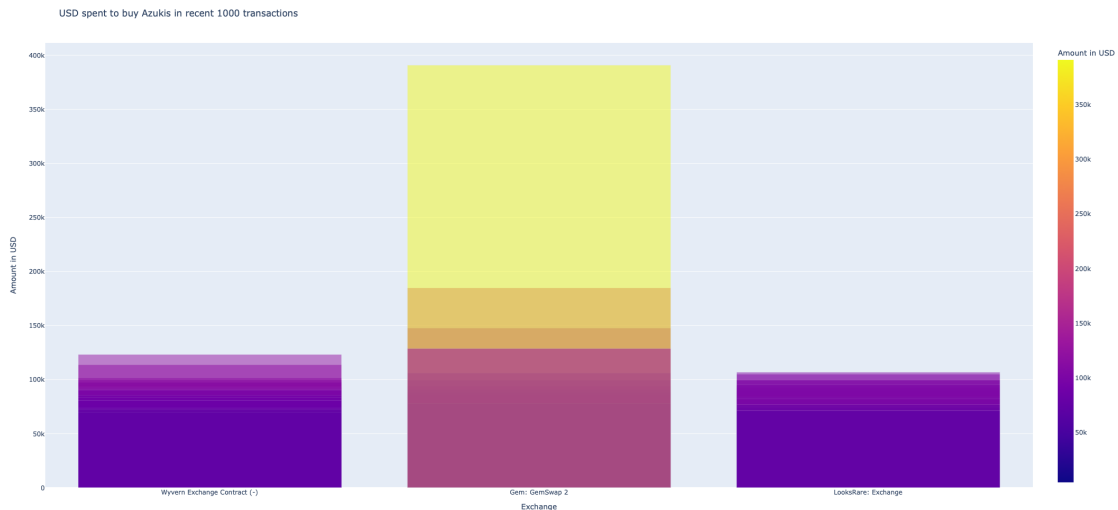
```
[9]: # Filter Through data for non null transactions
azuki_sales_df = azuki_tx_df[azuki_tx_df['value_quote'] != 0]
azuki_sales = azuki_sales_df[azuki_sales_df['to_address_label'].notnull()]

# 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

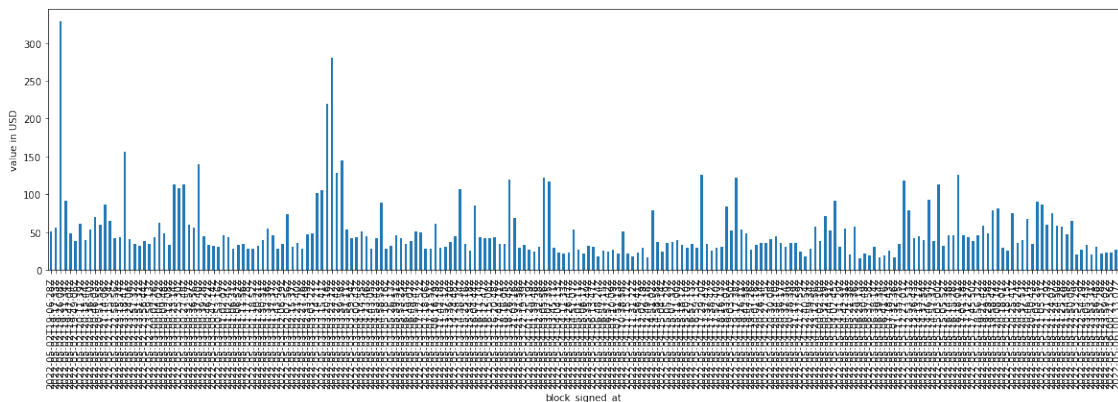
azuki_fees.plot.bar(rot = 90, figsize = (20,5), ylabel = 'value in USD')

```

```

[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()
```

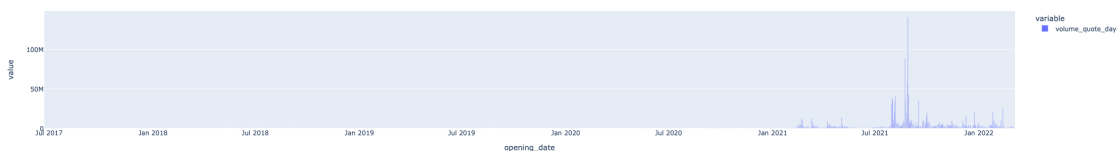
```
[11]:
```

	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]: # Querying 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()
```

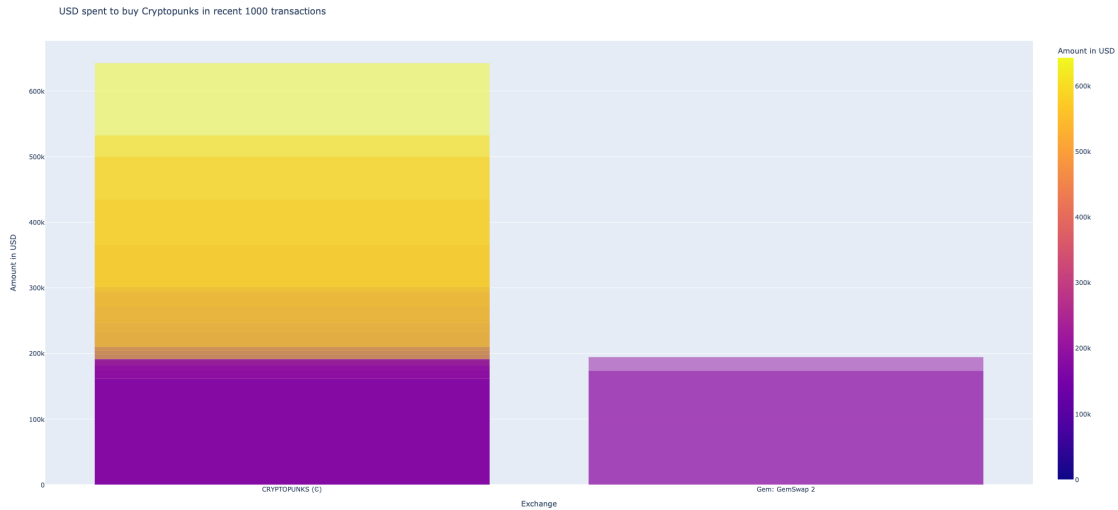
```
[13]:
```

	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()
```

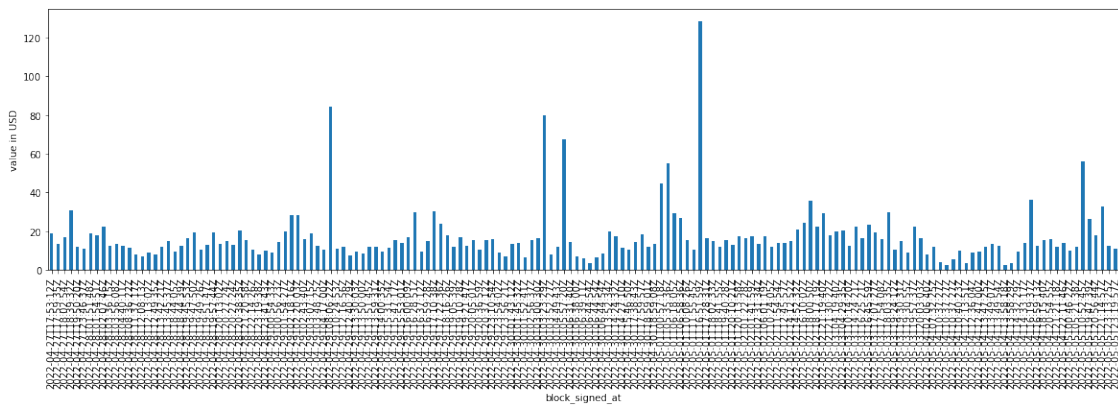


## 0.11 2.b Cryptopunks Fees paid

```
[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]: # 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')

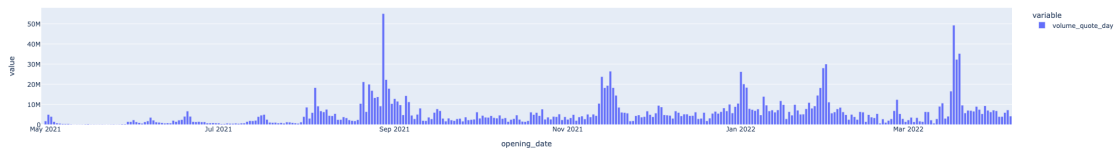
# Create Volume dataframe
BAYC_vol_df = pd.DataFrame(BAYC_df, columns = ['volume_quote_day',
    ↪'unique_token_ids_sold_count_day']).sort_index()
BAYC_vol_df.head()
```

```
[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]: # 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]: # Querying 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]:
```

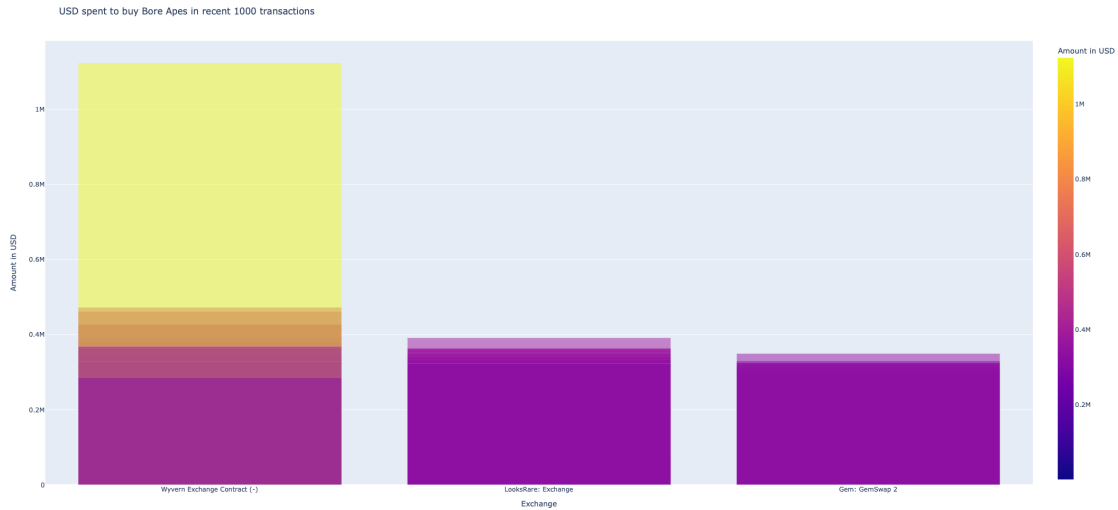
	to_address_label	fees_paid \
block_signed_at		
2022-05-02T20:37:49Z	None	80753868585244770
2022-05-02T20:44:31Z	Wyvern Exchange Contract (-)	19052443987785043
2022-05-02T20:50:02Z	None	11388694937249759
2022-05-02T20:55:00Z	None	17955072367955640
2022-05-02T20:55:32Z	None	4449937167409760

	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()
```

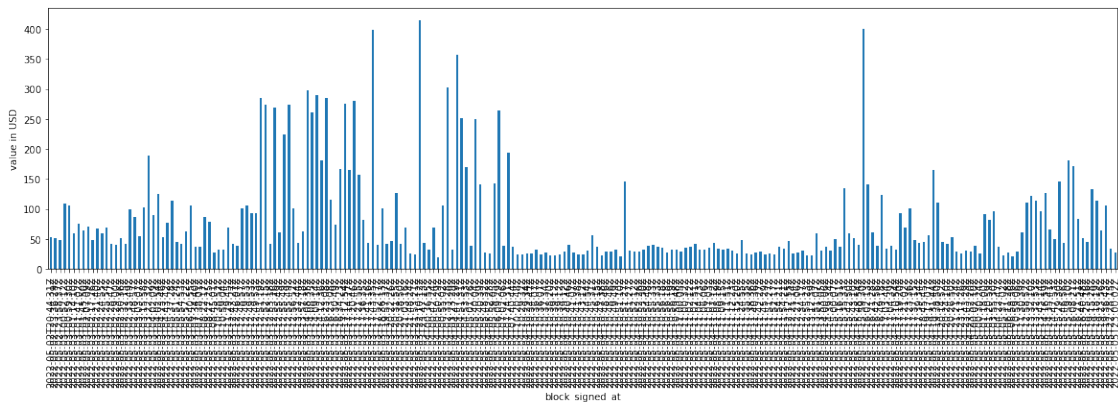


### 0.14 3.b BAYC Fees paid

```
[20]: # 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

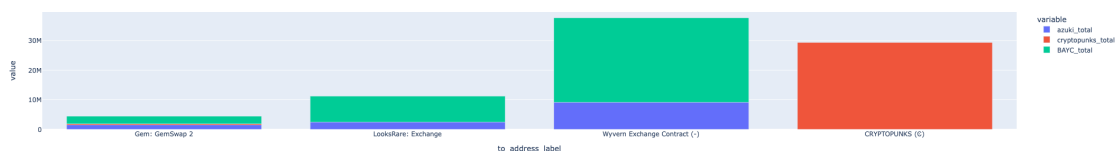
```
[21]: # Group by address label and sum the value
azuki_total = azuki_sales.groupby('to_address_label').sum()
cryptopunks_total = cryptopunks_sales.groupby('to_address_label').sum()
```

```
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]:
```

to_address_label	azuki_total	cryptopunks_total	BAYC_total
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)
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()
```

