

# startupfunding

November 23, 2024

## 1 Start Up Funding Analysis

```
[ ]: import gdown
import pandas as pd
import numpy as np

import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings("ignore")

pd.options.display.float_format = '{:.0f}'.format

%matplotlib inline
```

```
[ ]: df = pd.read_csv('/content/investments_VC.csv',encoding='unicode_escape')
df.head()
```

```
[ ]:          permalink           name \
0   /organization/waywire      #waywire
1   /organization/tv-communications &TV Communications
2   /organization/rock-your-paper  'Rock' Your Paper
3   /organization/in-touch-network (In)Touch Network
4   /organization/r-ranch-and-mine -R- Ranch and Mine

          homepage_url \
0      http://www.waywire.com
1      http://enjoyandtv.com
2      http://www.rockyourpaper.org
3      http://www.InTouchNetwork.com
4                  NaN

          category_list           market \
0  |Entertainment|Politics|Social Media|News|       News
1                           |Games|             Games
2                   |Publishing|Education| Publishing
3  |Electronics|Guides|Coffee|Restaurants|Music|i... Electronics
```

4

	funding_total_usd	status	country_code	state_code	region	...	\
0	17,50,000	acquired	USA	NY	New York City	...	
1	40,00,000	operating	USA	CA	Los Angeles	...	
2	40,000	operating	EST	NaN	Tallinn	...	
3	15,00,000	operating	GBR	NaN	London	...	
4	60,000	operating	USA	TX	Dallas	...	
secondary_market	product_crowdfunding	round_A	round_B	round_C	round_D	...	\
0	0	0	0	0	0	0	
1	0	0	0	0	0	0	
2	0	0	0	0	0	0	
3	0	0	0	0	0	0	
4	0	0	0	0	0	0	
round_E	round_F	round_G	round_H				
0	0	0	0	0			
1	0	0	0	0			
2	0	0	0	0			
3	0	0	0	0			
4	0	0	0	0			

### 1.1 Initial EDA

```
[1]: df.tail()
```

```
[ ]: permalink name homepage_url category_list market funding_total_usd \
54289     NaN   NaN           NaN       NaN   NaN           NaN
54290     NaN   NaN           NaN       NaN   NaN           NaN
54291     NaN   NaN           NaN       NaN   NaN           NaN
54292     NaN   NaN           NaN       NaN   NaN           NaN
54293     NaN   NaN           NaN       NaN   NaN           NaN

status country_code state_code region ... secondary_market \
54289     NaN         NaN       NaN   NaN   ...           NaN
54290     NaN         NaN       NaN   NaN   ...           NaN
54291     NaN         NaN       NaN   NaN   ...           NaN
54292     NaN         NaN       NaN   NaN   ...           NaN
54293     NaN         NaN       NaN   NaN   ...           NaN

product_crowdfunding round_A round_B round_C round_D round_E round_F \
54289                 NaN   NaN       NaN   NaN   NaN   NaN   NaN
54290                 NaN   NaN       NaN   NaN   NaN   NaN   NaN
54291                 NaN   NaN       NaN   NaN   NaN   NaN   NaN
```

```
54292           NaN      NaN      NaN      NaN      NaN      NaN      NaN      NaN
54293           NaN      NaN      NaN      NaN      NaN      NaN      NaN      NaN

      round_G  round_H
54289      NaN      NaN
54290      NaN      NaN
54291      NaN      NaN
54292      NaN      NaN
54293      NaN      NaN
```

[5 rows x 39 columns]

```
[ ]: df.shape
```

```
[ ]: (54294, 39)
```

Drop rows which are entirely empty.

```
[ ]: df.dropna(how='all', inplace=True)
```

```
[ ]: df.shape
```

```
[ ]: (49438, 39)
```

```
[ ]: df.columns
```

```
[ ]: Index(['permalink', 'name', 'homepage_url', 'category_list', 'market',
       'funding_total_usd', 'status', 'country_code', 'state_code', 'region',
       'city', 'funding_rounds', 'founded_at', 'founded_month',
       'founded_quarter', 'founded_year', 'first_funding_at',
       'last_funding_at', 'seed', 'venture', 'equity_crowdfunding',
       'undisclosed', 'convertible_note', 'debt_financing', 'angel', 'grant',
       'private_equity', 'post_ipo_equity', 'post_ipo_debt',
       'secondary_market', 'product_crowdfunding', 'round_A', 'round_B',
       'round_C', 'round_D', 'round_E', 'round_F', 'round_G', 'round_H'],
      dtype='object')
```

Data type of each column

```
[ ]: df.dtypes
```

```
[ ]: permalink          object
     name               object
     homepage_url        object
     category_list        object
     market              object
     funding_total_usd   object
     status              object
```

```
country_code          object
state_code            object
region               object
city                 object
funding_rounds       float64
founded_at           object
founded_month        object
founded_quarter      object
founded_year          float64
first_funding_at     object
last_funding_at      object
seed                 float64
venture              float64
equity_crowdfunding float64
undisclosed           float64
convertible_note     float64
debt_financing       float64
angel                float64
grant                float64
private_equity        float64
post_ipo_equity      float64
post_ipo_debt        float64
secondary_market     float64
product_crowdfunding float64
round_A               float64
round_B               float64
round_C               float64
round_D               float64
round_E               float64
round_F               float64
round_G               float64
round_H               float64
dtype: object
```

```
[ ]: df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 49438 entries, 0 to 49437
Data columns (total 39 columns):
 #   Column           Non-Null Count  Dtype  
 ---  --  
 0   permalink        49438 non-null   object 
 1   name              49437 non-null   object 
 2   homepage_url     45989 non-null   object 
 3   category_list    45477 non-null   object 
 4   market            45470 non-null   object 
 5   funding_total_usd 49438 non-null   object
```

```
6   status          48124 non-null  object
7   country_code    44165 non-null  object
8   state_code      30161 non-null  object
9   region          44165 non-null  object
10  city            43322 non-null  object
11  funding_rounds 49438 non-null  float64
12  founded_at      38554 non-null  object
13  founded_month   38482 non-null  object
14  founded_quarter 38482 non-null  object
15  founded_year    38482 non-null  float64
16  first_funding_at 49438 non-null  object
17  last_funding_at 49438 non-null  object
18  seed             49438 non-null  float64
19  venture          49438 non-null  float64
20  equity_crowdfunding 49438 non-null  float64
21  undisclosed       49438 non-null  float64
22  convertible_note 49438 non-null  float64
23  debt_financing   49438 non-null  float64
24  angel             49438 non-null  float64
25  grant             49438 non-null  float64
26  private_equity    49438 non-null  float64
27  post_ipo_equity   49438 non-null  float64
28  post_ipo_debt     49438 non-null  float64
29  secondary_market  49438 non-null  float64
30  product_crowdfunding 49438 non-null  float64
31  round_A           49438 non-null  float64
32  round_B           49438 non-null  float64
33  round_C           49438 non-null  float64
34  round_D           49438 non-null  float64
35  round_E           49438 non-null  float64
36  round_F           49438 non-null  float64
37  round_G           49438 non-null  float64
38  round_H           49438 non-null  float64
dtypes: float64(23), object(16)
memory usage: 15.1+ MB
```

Columns having Null values

```
[ ]: df.isnull().sum()[df.isnull().sum() > 0 ]
```

```
[ ]: name          1
homepage_url    3449
category_list   3961
market          3968
status          1314
country_code    5273
state_code      19277
region          5273
```

```

city           6116
founded_at    10884
founded_month 10956
founded_quarter 10956
founded_year   10956
dtype: int64

```

```
[ ]: df.describe()
```

	funding_rounds	founded_year	seed	venture	equity_crowdfunding	\
count	49438	38482	49438	49438	49438	
mean	2	2007	217321	7501051	6163	
std	1	8	1056985	28471124	199905	
min	1	1902	0	0	0	
25%	1	2006	0	0	0	
50%	1	2010	0	0	0	
75%	2	2012	25000	5000000	0	
max	18	2014	130000000	2351000000	25000000	
	undisclosed	convertible_note	debt_financing	angel	grant	\
count	49438	49438	49438	49438	49438	...
mean	130221	23364	1888157	65419	162845	...
std	2981404	1432046	138204566	658291	5612088	...
min	0	0	0	0	0	...
25%	0	0	0	0	0	...
50%	0	0	0	0	0	...
75%	0	0	0	0	0	...
max	292432833	300000000	30079503000	63590263	750500000	...
	secondary_market	product_crowdfunding	round_A	round_B	round_C	\
count	49438	49438	49438	49438	49438	
mean	38456	7074	1243955	1492891	1205356	
std	3864461	428217	5531974	7472704	7993592	
min	0	0	0	0	0	
25%	0	0	0	0	0	
50%	0	0	0	0	0	
75%	0	0	0	0	0	
max	680611554	72000000	319000000	542000000	490000000	
	round_D	round_E	round_F	round_G	round_H	
count	49438	49438	49438	49438	49438	
mean	737526	342468	169769	57671	14232	
std	9815218	5406915	6277905	5252312	2716865	
min	0	0	0	0	0	
25%	0	0	0	0	0	
50%	0	0	0	0	0	
75%	0	0	0	0	0	

```
max    1200000000 400000000 1060000000 1000000000 600000000  
[8 rows x 23 columns]
```

Drop any duplicate rows

```
[ ]: df = df.drop_duplicates()  
print(df.shape)
```

```
(49438, 39)
```

Unique values in a column

```
[ ]: cat_columns, num_columns = list() , list()  
CAT_THRESHOLD = 20  
print("-"*150)  
for col in df.columns:  
    if df[col].nunique() > CAT_THRESHOLD:  
        num_columns.append(col)  
        print(col, " : " , df[col].nunique())  
  
    else:  
        cat_columns.append(col)  
        print(col, " : " , df[col].nunique(), "\n")  
  
print("-"*150)
```

---

---

```
permalink : 49436
```

---

---

```
name : 49350
```

---

---

```
homepage_url : 45850
```

---

---

```
category_list : 16675
```

---

---

```
market : 753
```

---

---

```
funding_total_usd : 14617
```

---

---

```
status : 3
```

country\_code : 115

state\_code : 61

region : 1089

city : 4188

funding\_rounds : 17

founded\_at : 3369

founded\_month : 420

founded\_quarter : 218

founded\_year : 103

first\_funding\_at : 3914

last\_funding\_at : 3657

seed : 3337

venture : 9300

equity\_crowdfunding : 252

undisclosed : 687

convertible\_note : 299

debt\_financing : 1872

angel : 999

grant : 532

private\_equity : 847

post\_ipo\_equity : 239

post\_ipo\_debt : 57

secondary\_market : 20

product\_crowdfunding : 176

round\_A : 2035

round\_B : 1269

round\_C : 740

round\_D : 458

round\_E : 225

round\_F : 110

round\_G : 32

```
round_H : 5
```

### 1.1.1 Data Cleaning

Name column Null values replaced with Not available value

```
[ ]: df['name'] = df['name'].fillna(value='Not Available')
```

Any column having null values with same name is replaced by the existing information present for that name in the data.

```
[ ]: name_map_df = df[df['homepage_url'].notnull()][['name', 'homepage_url']].  
    ↪drop_duplicates().reset_index(drop=True)  
df.loc[df['homepage_url'].isnull(), 'homepage_url'] = df[df['homepage_url'].  
    ↪isnull()]['name'].map(dict(name_map_df.values))
```

```
[ ]: name_map_df = df[df['category_list'].notnull()][['name', 'category_list']].  
    ↪drop_duplicates().reset_index(drop=True)  
df.loc[df['category_list'].isnull(), 'category_list'] = df[df['category_list'].  
    ↪isnull()]['name'].map(dict(name_map_df.values))
```

```
[ ]: name_map_df = df[df['market'].notnull()][['name', 'market']].  
    ↪drop_duplicates().reset_index(drop=True)  
df.loc[df['market'].isnull(), 'market'] = df[df['market'].  
    ↪isnull()]['name'].map(dict(name_map_df.values))
```

```
[ ]: name_map_df = df[df['status'].notnull()][['name', 'status']].drop_duplicates().  
    ↪reset_index(drop=True)  
df.loc[df['status'].isnull(), 'status'] = df[df['status'].isnull()]['name'].  
    ↪map(dict(name_map_df.values))
```

```
[ ]: name_map_df = df[df['country_code'].notnull()][['name', 'country_code']].  
    ↪drop_duplicates().reset_index(drop=True)  
df.loc[df['country_code'].isnull(), 'country_code'] = df[df['country_code'].  
    ↪isnull()]['name'].map(dict(name_map_df.values))
```

```
[ ]: name_map_df = df[df['state_code'].notnull()][['name', 'state_code']].  
    ↪drop_duplicates().reset_index(drop=True)  
df.loc[df['state_code'].isnull(), 'state_code'] = df[df['state_code'].  
    ↪isnull()]['name'].map(dict(name_map_df.values))
```

```
[ ]: name_map_df = df[df['region'].notnull()][['name', 'region']].drop_duplicates().  
    ↪reset_index(drop=True)
```

```

df.loc[df['region'].isnull(), 'region'] = df[df['region'].isnull()]['name'].
    ↪map(dict(name_map_df.values))

[ ]: name_map_df = df[df['city'].notnull()][['name', 'city']].drop_duplicates().
    ↪reset_index(drop=True)
df.loc[df['city'].isnull(), 'city'] = df[df['city'].isnull()]['name'].
    ↪map(dict(name_map_df.values))

[ ]: name_map_df = df[df['founded_at'].notnull()][['name', 'founded_at']].
    ↪drop_duplicates().reset_index(drop=True)
df.loc[df['founded_at'].isnull(), 'founded_at'] = df[df['founded_at']].
    ↪isnull()['name'].map(dict(name_map_df.values))

[ ]: name_map_df = df[df['founded_month'].notnull()][['name', 'founded_month']].
    ↪drop_duplicates().reset_index(drop=True)
df.loc[df['founded_month'].isnull(), 'founded_month'] = df[df['founded_month']].
    ↪isnull()['name'].map(dict(name_map_df.values))

[ ]: name_map_df = df[df['founded_quarter'].notnull()][['name', 'founded_quarter']].
    ↪drop_duplicates().reset_index(drop=True)
df.loc[df['founded_quarter'].isnull(), 'founded_quarter'] = df[df['founded_quarter']].
    ↪isnull()['name'].map(dict(name_map_df.values))

[ ]: name_map_df = df[df['founded_year'].notnull()][['name', 'founded_year']].
    ↪drop_duplicates().reset_index(drop=True)
df.loc[df['founded_year'].isnull(), 'founded_year'] = df[df['founded_year']].
    ↪isnull()['name'].map(dict(name_map_df.values))

[ ]: df.isnull().sum()[df.isnull().sum() > 0]

[ ]: homepage_url      3439
category_list        3948
market               3955
status               1312
country_code         5251
state_code           19248
region              5251
city                 6092
founded_at          10852
founded_month        10925
founded_quarter     10925
founded_year         10925
dtype: int64

```

After replacing known null values still unknown values tend to persist. We replace those with Not Available attribute.

```
[ ]: df['homepage_url'] = df['homepage_url'].fillna(value='Not Available')
df['category_list'] = df['category_list'].fillna(value='Not Available')
df['market'] = df['market'].fillna(value='Not Available')
df['status'] = df['status'].fillna(value='Not Available')
df['country_code'] = df['country_code'].fillna(value='Not Available')
df['state_code'] = df['state_code'].fillna(value='Not Available')
df['region'] = df['region'].fillna(value='Not Available')
df['city'] = df['city'].fillna(value='Not Available')
```

Date Time null values replaced with 0

```
[ ]: df['founded_at'] = df['founded_at'].fillna(value='0-0-0')
df['founded_month'] = df['founded_month'].fillna(value='0-0')
df['founded_quarter'] = df['founded_quarter'].fillna(value='0-Q0')
df['founded_year'] = df['founded_year'].fillna(value=0.0)
```

```
[ ]: df.isnull().sum()[df.isnull().sum() > 0]
```

```
[ ]: Series([], dtype: int64)
```

The data has no null values.

```
[ ]: df['category_list'] = df['category_list'].str.split(' | ')
df = df.explode('category_list')
```

Explode the category column for categorywise analysis.

```
[ ]: df.shape
```

```
[ ]: (194485, 39)
```

```
[ ]: df_clean = df[df['category_list'] != '']
```

```
[ ]: df_clean.shape
```

```
[ ]: (103511, 39)
```

```
[ ]: df_clean = df_clean.drop_duplicates()
print(df_clean.shape)
```

```
(103506, 39)
```

```
[ ]: df_clean.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 103506 entries, 0 to 49437
Data columns (total 39 columns):
 #   Column           Non-Null Count  Dtype  
 ---  -- 
 0   _id              103506 non-null   int64  
 1   name             103506 non-null   object 
 2   homepage_url     103506 non-null   object 
 3   category_list    103506 non-null   object 
 4   market           103506 non-null   object 
 5   status            103506 non-null   object 
 6   country_code     103506 non-null   object 
 7   state_code        103506 non-null   object 
 8   region            103506 non-null   object 
 9   city              103506 non-null   object 
 10  founded_at       103506 non-null   object 
 11  founded_month    103506 non-null   int64  
 12  founded_quarter  103506 non-null   int64  
 13  founded_year      103506 non-null   float64
 14  created_at        103506 non-null   object 
 15  updated_at        103506 non-null   object 
 16  type              103506 non-null   object 
 17  size_gb           103506 non-null   float64
 18  price              103506 non-null   float64
 19  rating             103506 non-null   float64
 20  reviews            103506 non-null   int64  
 21  user_id           103506 non-null   int64  
 22  user_name          103506 non-null   object 
 23  user_email         103506 non-null   object 
 24  user_phone         103506 non-null   object 
 25  user_address       103506 non-null   object 
 26  user_city           103506 non-null   object 
 27  user_state          103506 non-null   object 
 28  user_country        103506 non-null   object 
 29  user_market          103506 non-null   object 
 30  user_status          103506 non-null   object 
 31  user_type            103506 non-null   object 
 32  user_size_gb        103506 non-null   float64
 33  user_price           103506 non-null   float64
 34  user_rating          103506 non-null   float64
 35  user_reviews         103506 non-null   int64  
 36  user_created_at      103506 non-null   object 
 37  user_updated_at      103506 non-null   object 
 38  user_type_id         103506 non-null   int64  
 39  user_is_active        103506 non-null   int64 
```

```
0    permalink           103506 non-null  object
1    name                 103506 non-null  object
2    homepage_url         103506 non-null  object
3    category_list        103506 non-null  object
4    market               103506 non-null  object
5    funding_total_usd   103506 non-null  object
6    status               103506 non-null  object
7    country_code         103506 non-null  object
8    state_code            103506 non-null  object
9    region               103506 non-null  object
10   city                 103506 non-null  object
11   funding_rounds      103506 non-null  float64
12   founded_at           103506 non-null  object
13   founded_month        103506 non-null  object
14   founded_quarter      103506 non-null  object
15   founded_year          103506 non-null  float64
16   first_funding_at     103506 non-null  object
17   last_funding_at       103506 non-null  object
18   seed                 103506 non-null  float64
19   venture              103506 non-null  float64
20   equity_crowdfunding  103506 non-null  float64
21   undisclosed           103506 non-null  float64
22   convertible_note      103506 non-null  float64
23   debt_financing        103506 non-null  float64
24   angel                103506 non-null  float64
25   grant                103506 non-null  float64
26   private_equity        103506 non-null  float64
27   post_ipo_equity       103506 non-null  float64
28   post_ipo_debt         103506 non-null  float64
29   secondary_market      103506 non-null  float64
30   product_crowdfunding 103506 non-null  float64
31   round_A               103506 non-null  float64
32   round_B               103506 non-null  float64
33   round_C               103506 non-null  float64
34   round_D               103506 non-null  float64
35   round_E               103506 non-null  float64
36   round_F               103506 non-null  float64
37   round_G               103506 non-null  float64
38   round_H               103506 non-null  float64
dtypes: float64(23), object(16)
memory usage: 31.6+ MB
```

```
[ ]: df_clean.isnull().sum()[df_clean.isnull().sum() > 0 ]
```

```
[ ]: Series([], dtype: int64)
```

Cleaning garbage values

```
[ ]: df_clean['funding_total_usd'] = df_clean['funding_total_usd'].str.
    ↪replace(",","",)
df_clean['funding_total_usd'] = df_clean['funding_total_usd'].str.replace('�
    ↪- ','0')
df_clean['funding_total_usd'] = df_clean['funding_total_usd'].astype(int)
```

### 1.1.2 Feature Engineering

Creating new features for analysis

```
[ ]: df_clean['founded_month_num'] = df_clean['founded_month'].str.split('-').
    ↪apply(lambda x: int(x[1]))
df_clean['founded_quarter_q'] = df_clean['founded_quarter'].str.split('-').
    ↪apply(lambda x: x[1])
df_clean['founded_year'] = df_clean['founded_year'].astype(int)
```

```
[ ]: df_clean['first_funding_at_year'] = df_clean['first_funding_at'].str.split('-').
    ↪apply(lambda x: int(x[0]))
df_clean['last_funding_at_year'] = df_clean['last_funding_at'].str.split('-').
    ↪apply(lambda x: int(x[0]))
df_clean['first_funding_at_month'] = df_clean['first_funding_at'].str.
    ↪split('-').apply(lambda x: int(x[1]))
df_clean['last_funding_at_month'] = df_clean['last_funding_at'].str.split('-').
    ↪apply(lambda x: int(x[1]))
```

## 1.2 Different Sources of Funds

Analysis of different funds a startup can acquire

```
[ ]: df_clean.describe()
```

	funding_total_usd	funding_rounds	founded_year	seed	venture	\
count	103506	103506	103506	103506	103506	
mean	12085551	2	1712	287255	7392058	
std	117021388	1	712	1223312	32418900	
min	0	1	0	0	0	
25%	60000	1	2003	0	0	
50%	882560	1	2009	0	0	
75%	5500000	2	2012	121664	4000000	
max	30079503000	18	2014	130000000	2351000000	
	equity_crowdfunding	undisclosed	convertible_note	debt_financing	\	
count	103506	103506	103506	103506	103506	
mean	5259	100576	19374	1333450		
std	177865	2560102	1019986	96786095		
min	0	0	0	0		
25%	0	0	0	0		

50%		0	0	0	0			
75%		0	0	0	0			
max		25000000	292432833	300000000	30079503000			
	angel	...	round_D	round_E	round_F	round_G	round_H	\
count	103506	...	103506	103506	103506	103506	103506	
mean	87893	...	877997	394556	208944	68722	14527	
std	632943	...	14149105	6116868	7899962	5527624	2664609	
min	0	...	0	0	0	0	0	
25%	0	...	0	0	0	0	0	
50%	0	...	0	0	0	0	0	
75%	0	...	0	0	0	0	0	
max	63590263	...	1200000000	4000000000	10600000000	10000000000	6000000000	
	founded_month_num		first_funding_at_year		last_funding_at_year		\	
count		103506		103506		103506		
mean		3		2010		2012		
std		4		30		21		
min		0		1		1		
25%		1		2009		2011		
50%		1		2012		2013		
75%		6		2013		2014		
max		12		2014		2015		
	first_funding_at_month		last_funding_at_month					
count		103506		103506				
mean		6		6				
std		4		3				
min		1		1				
25%		3		3				
50%		6		6				
75%		9		9				
max		12		12				

[8 rows x 29 columns]

```
[ ]: fundings = [
    'seed',
    'venture',
    'equity_crowdfunding',
    'undisclosed',
    'convertible_note',
    'debt_financing',
    'angel',
    'grant',
    'private_equity',
    'post_ipo_equity',
```

```

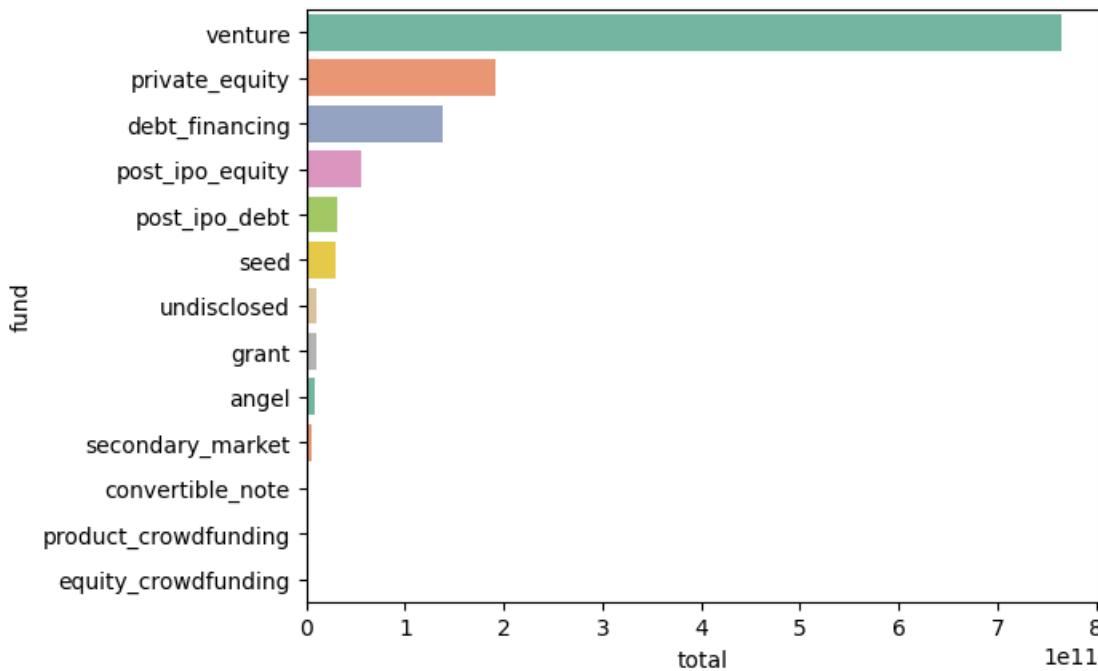
'post_ipo_debt',
'secondary_market',
'product_crowdfunding',
]

fund_list, total_list = list(), list()
for fund in fundings:
    fund_list.append(fund)
    total_list.append(df_clean[fund].sum())

df_fund = pd.DataFrame({'fund':fund_list,'total':total_list})
df_fund = df_fund.sort_values('total',ascending=False)
sns.barplot(x=df_fund['total'],y=df_fund['fund'],palette='Set2')

```

[ ]: <Axes: xlabel='total', ylabel='fund'>



Insights: From the above plot it can be seen Venture Fundings is the largest source of funding for start ups.

[ ]: rounds = ['round\_A',  
           'round\_B',  
           'round\_C',  
           'round\_D',  
           'round\_E',  
           'round\_F',

```

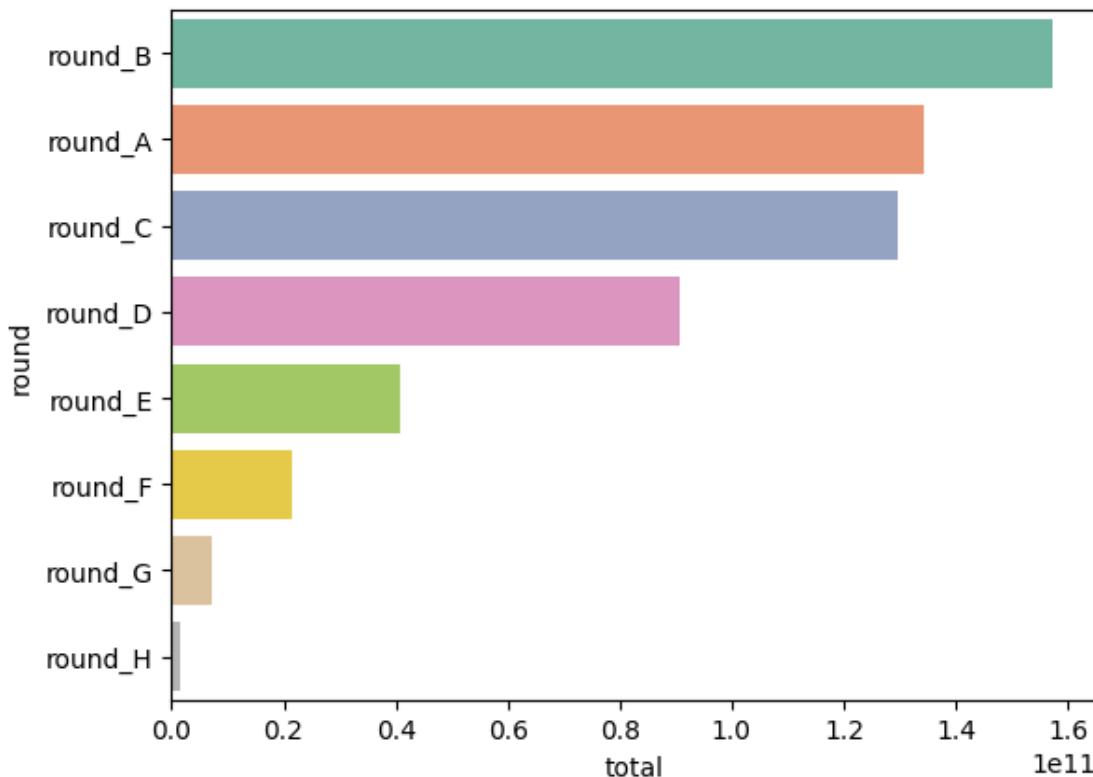
'round_G',
'round_H',]

round_list, total_list = list(), list()
for round in rounds:
    round_list.append(round)
    total_list.append(df_clean[round].sum())

df_round = pd.DataFrame({'round':round_list,'total':total_list})
df_round = df_round.sort_values('total',ascending=False)
sns.barplot(x=df_round['total'],y=df_round['round'],palette='Set2')

```

[ ]: <Axes: xlabel='total', ylabel='round'>



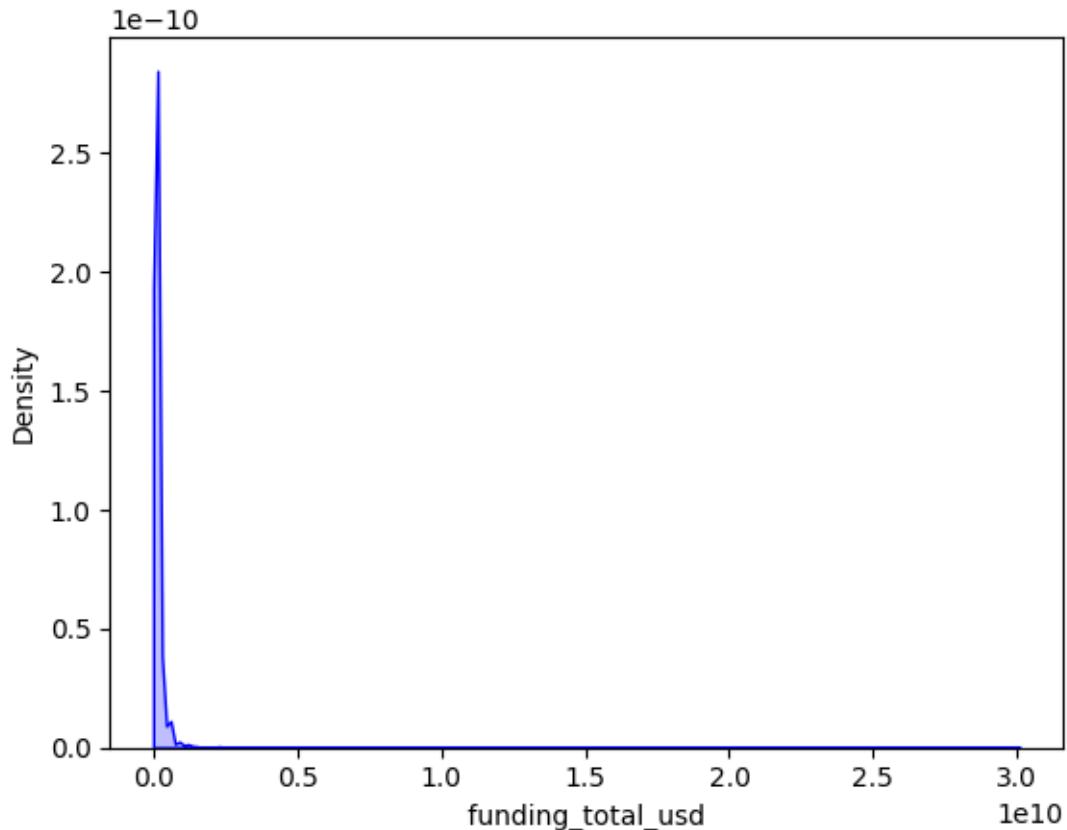
Insights: From the above plot it can be seen Round B Fundings is the largest source of funding for start ups.

Recomendations: Round B always poses a chance of raising more money than any other rounds.

### 1.2.1 Univariate distribution of all types of funds

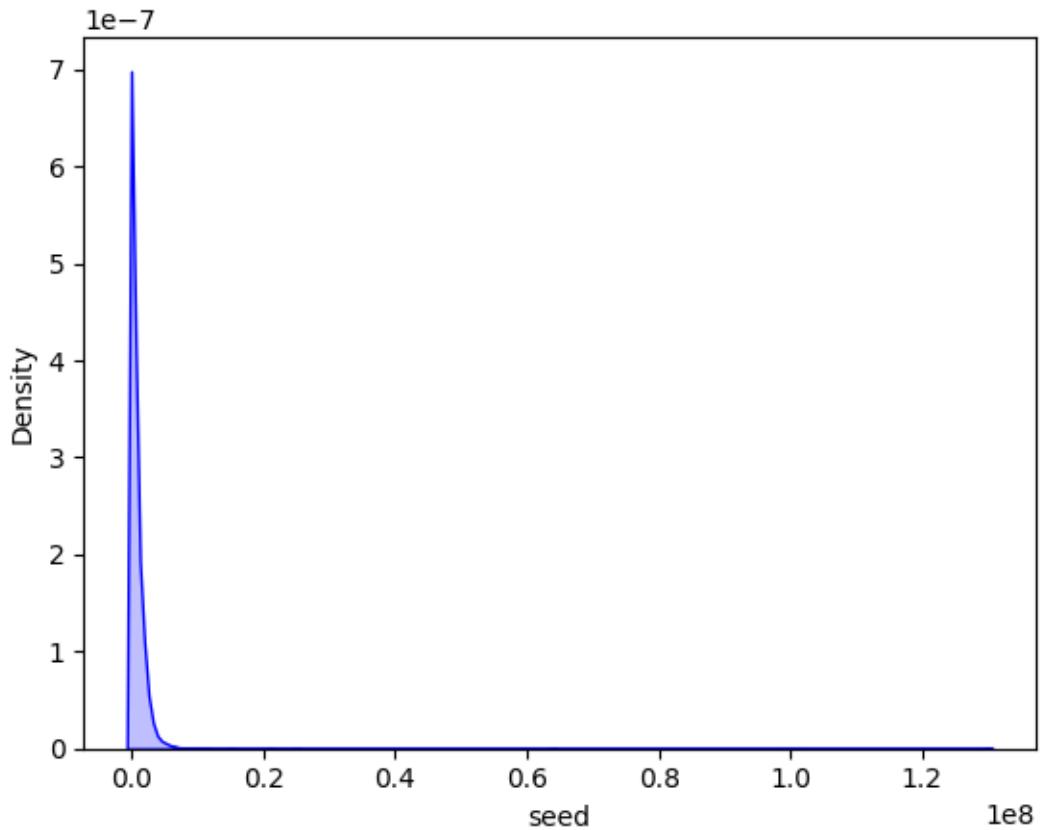
```
[ ]: sns.kdeplot(df_clean[df_clean['funding_total_usd']!=0]['funding_total_usd'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='funding_total_usd', ylabel='Density'>
```



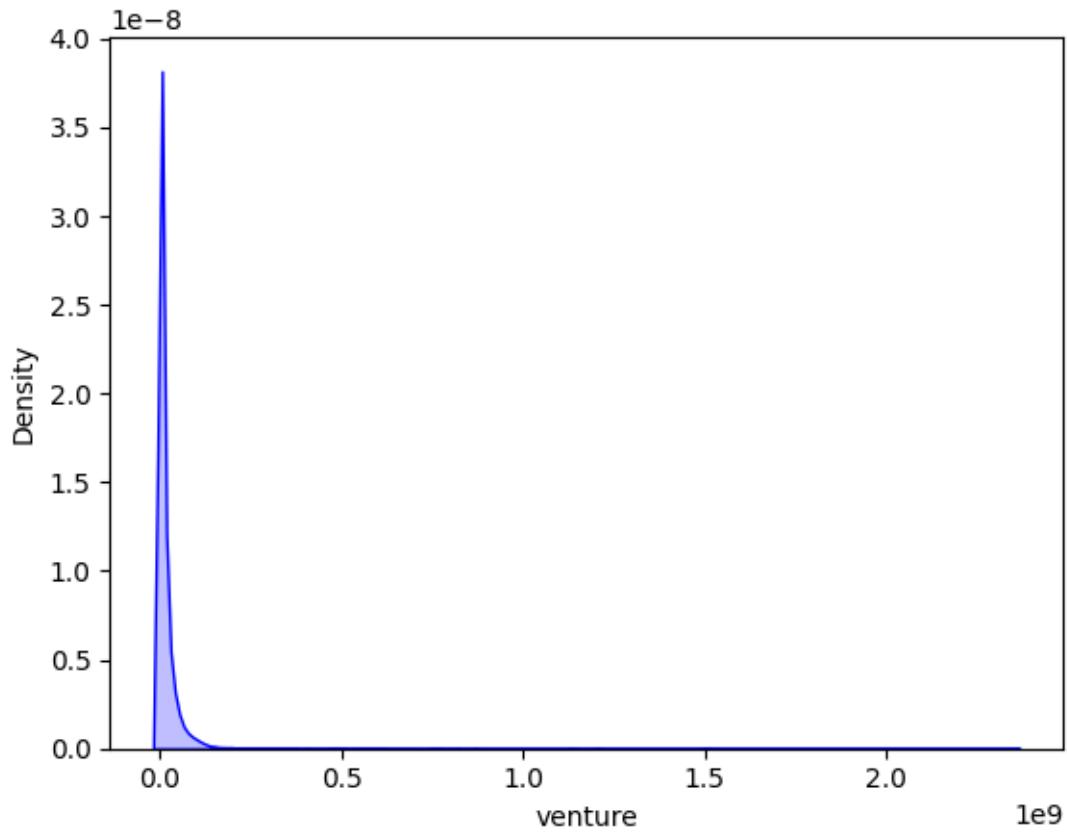
```
[ ]: sns.kdeplot(df_clean[df_clean['seed']!=0]['seed'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='seed', ylabel='Density'>
```



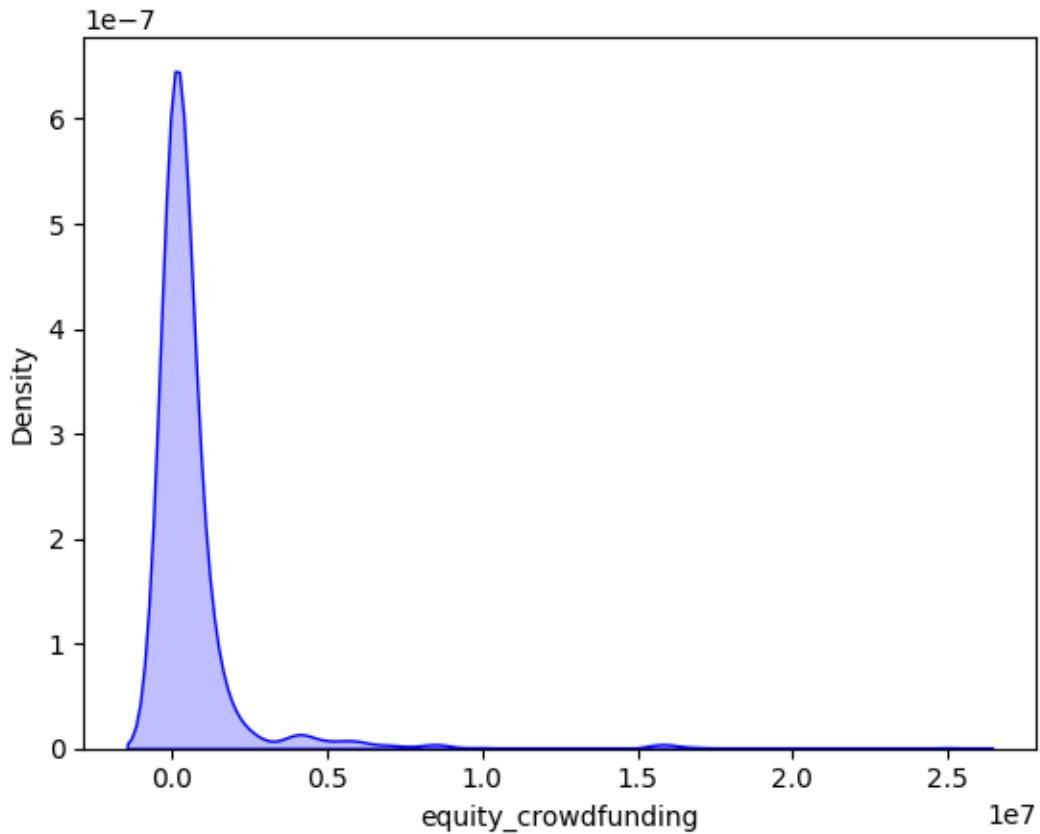
```
[ ]: sns.kdeplot(df_clean[df_clean['venture']!=0]['venture'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='venture', ylabel='Density'>
```



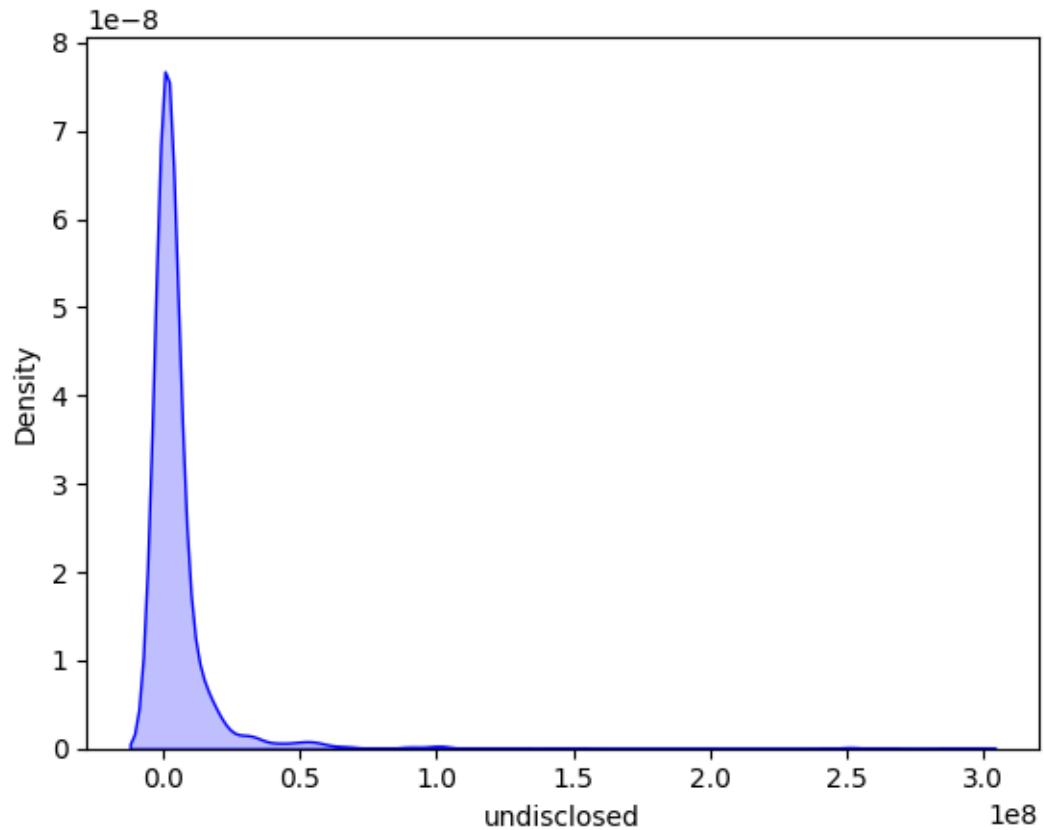
```
[ ]: sns.kdeplot(df_clean[df_clean['equity_crowdfunding']!=0]['equity_crowdfunding'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='equity_crowdfunding', ylabel='Density'>
```



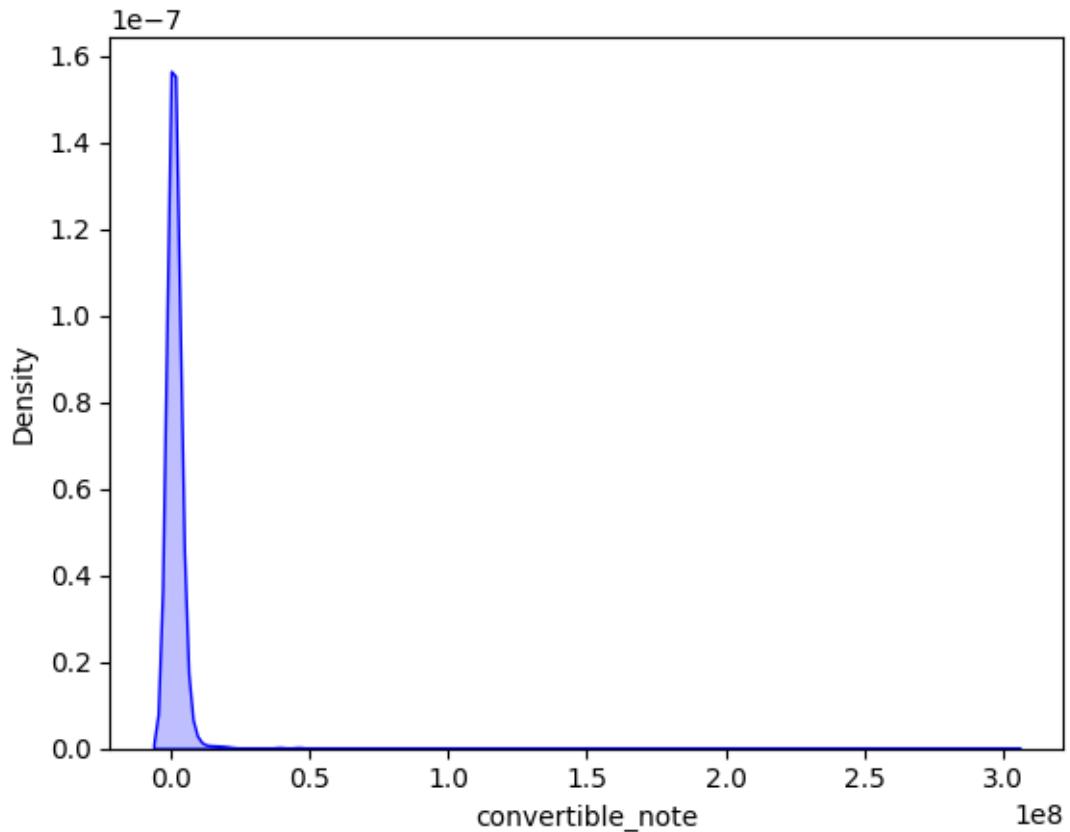
```
[ ]: sns.kdeplot(df_clean[df_clean['undisclosed']!=0]['undisclosed'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='undisclosed', ylabel='Density'>
```



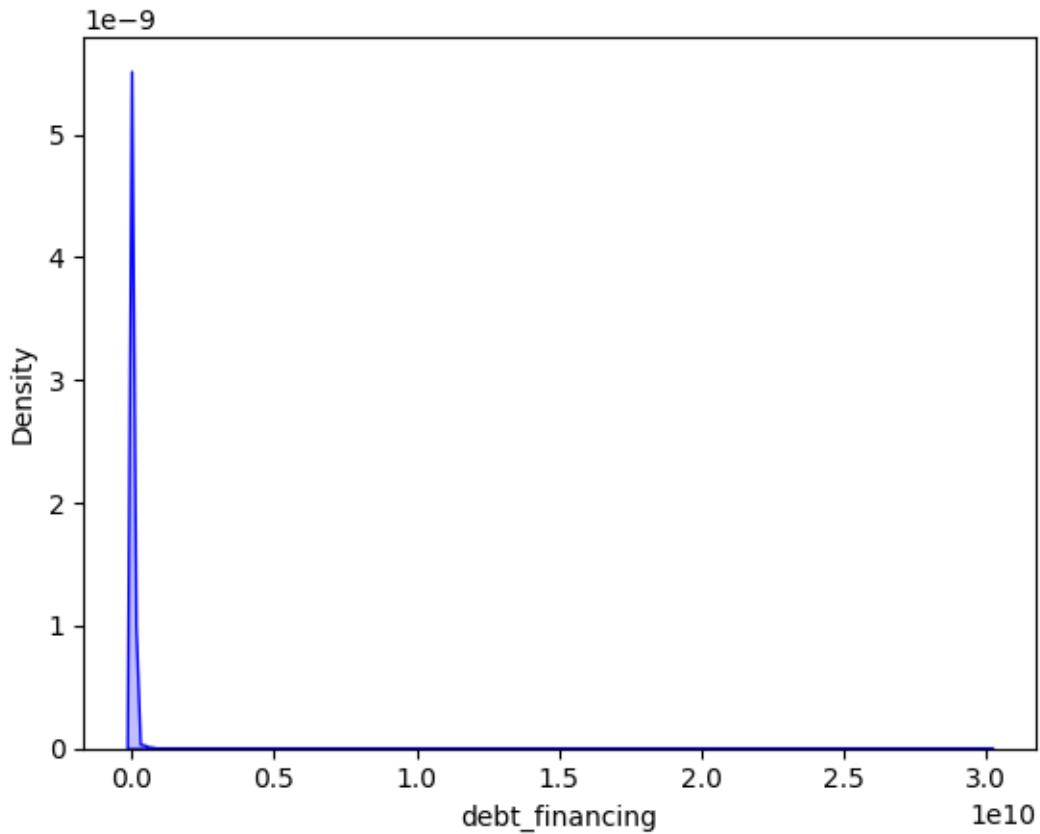
```
[ ]: sns.kdeplot(df_clean[df_clean['convertible_note']!=0]['convertible_note'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='convertible_note', ylabel='Density'>
```



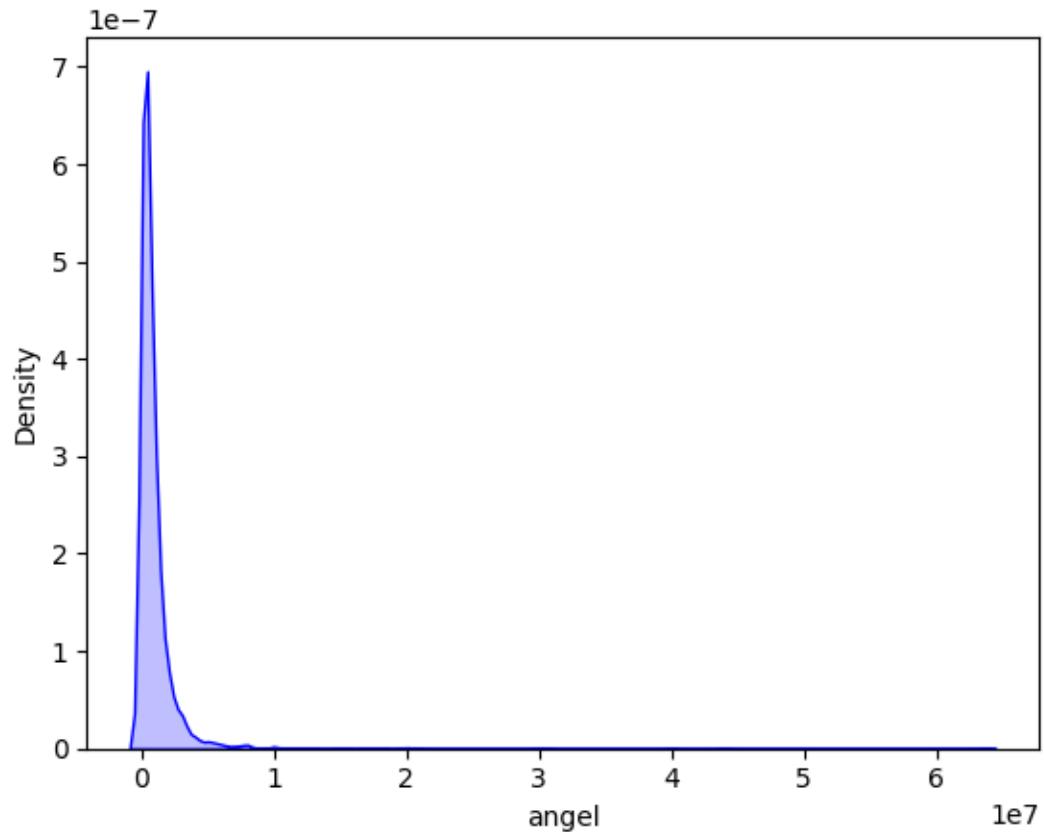
```
[ ]: sns.kdeplot(df_clean[df_clean['debt_financing']!
    ↴=0] ['debt_financing'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='debt_financing', ylabel='Density'>
```



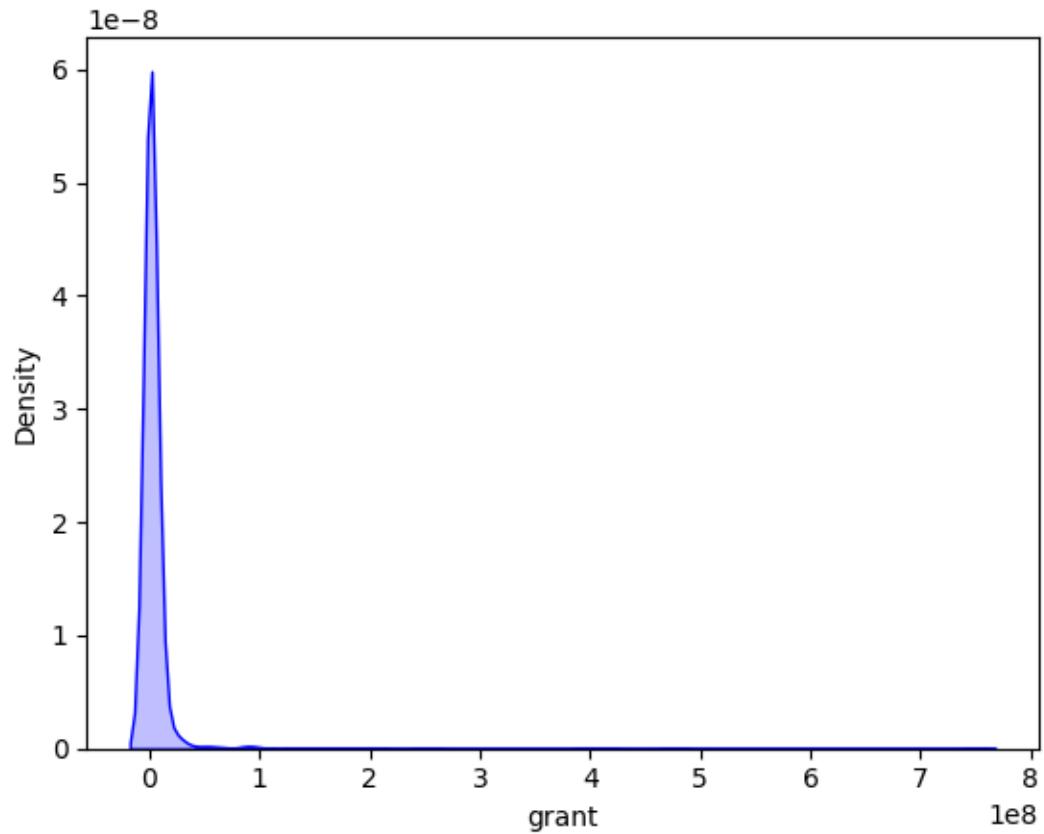
```
[ ]: sns.kdeplot(df_clean[df_clean['angel']!=0]['angel'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='angel', ylabel='Density'>
```



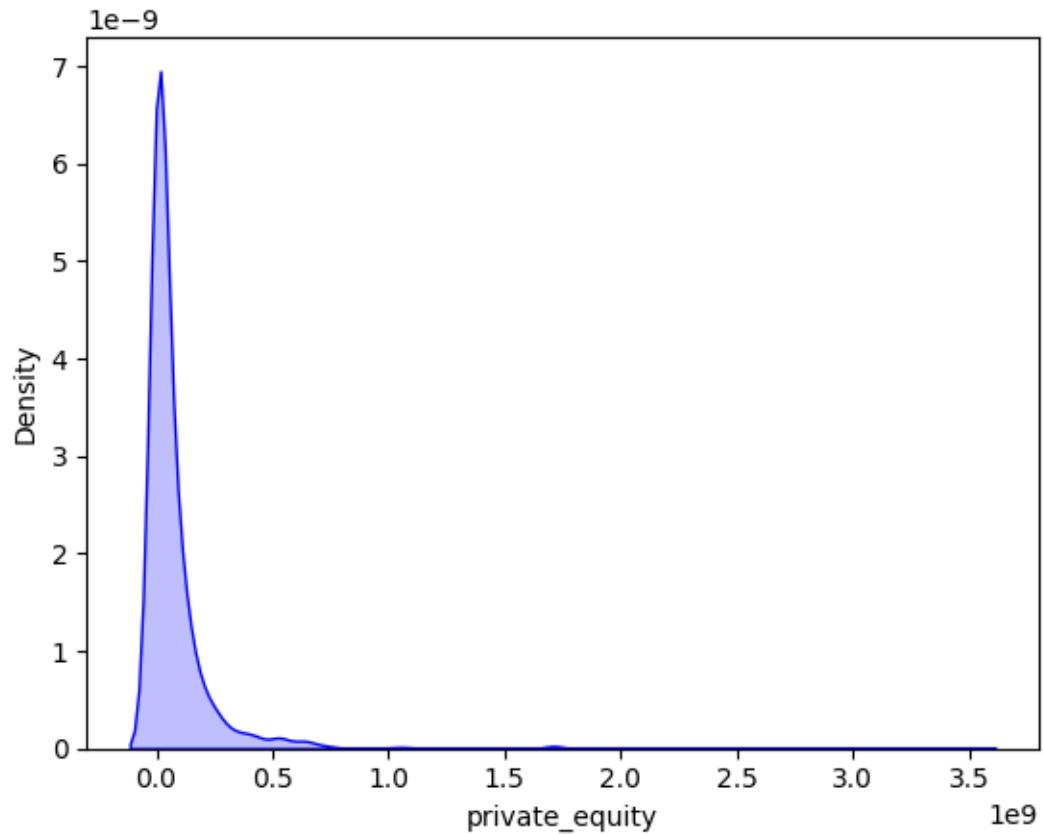
```
[ ]: sns.kdeplot(df_clean[df_clean['grant']!=0]['grant'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='grant', ylabel='Density'>
```



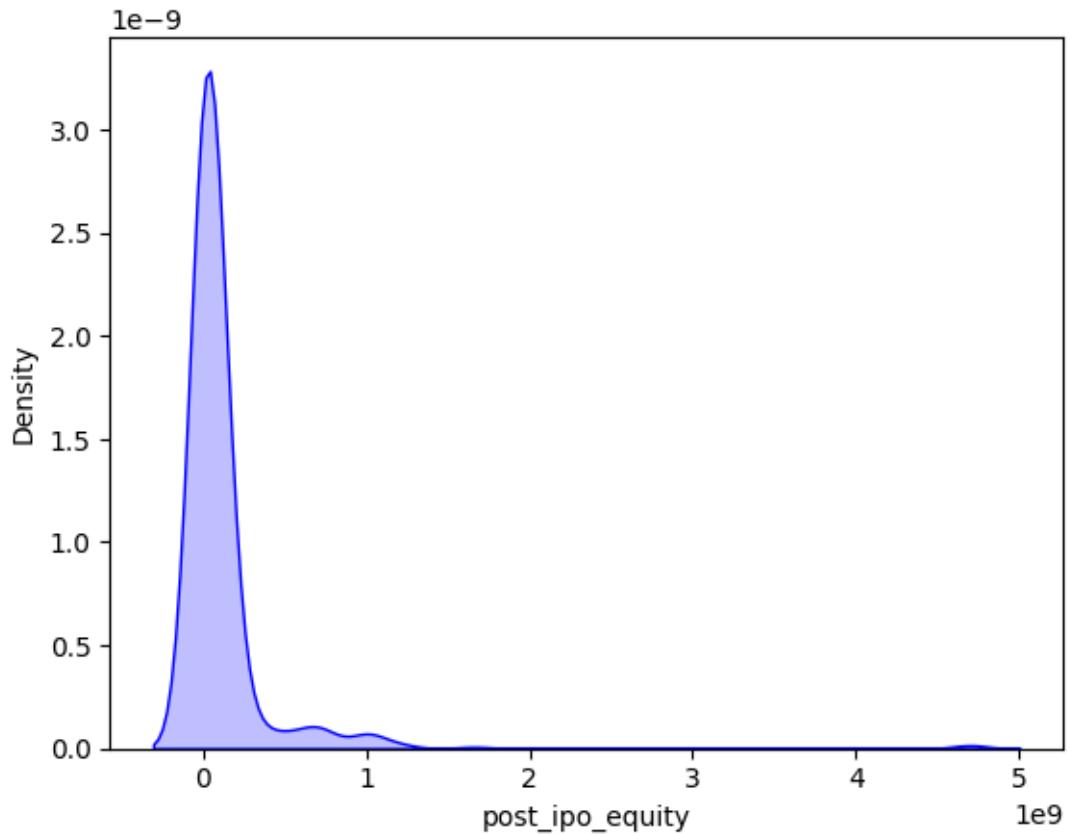
```
[ ]: sns.kdeplot(df_clean[df_clean['private_equity'] != 0] ['private_equity'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='private_equity', ylabel='Density'>
```



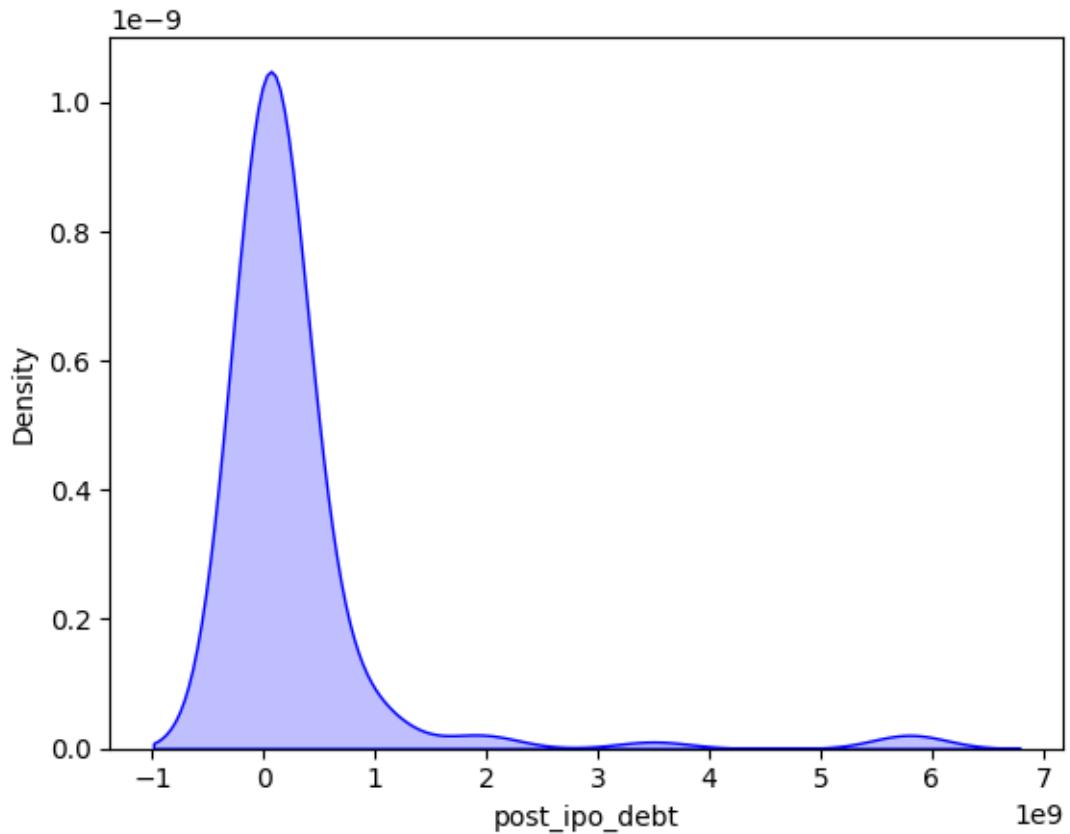
```
[ ]: sns.kdeplot(df_clean[df_clean['post_ipo_equity'] != 0]['post_ipo_equity'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='post_ipo_equity', ylabel='Density'>
```



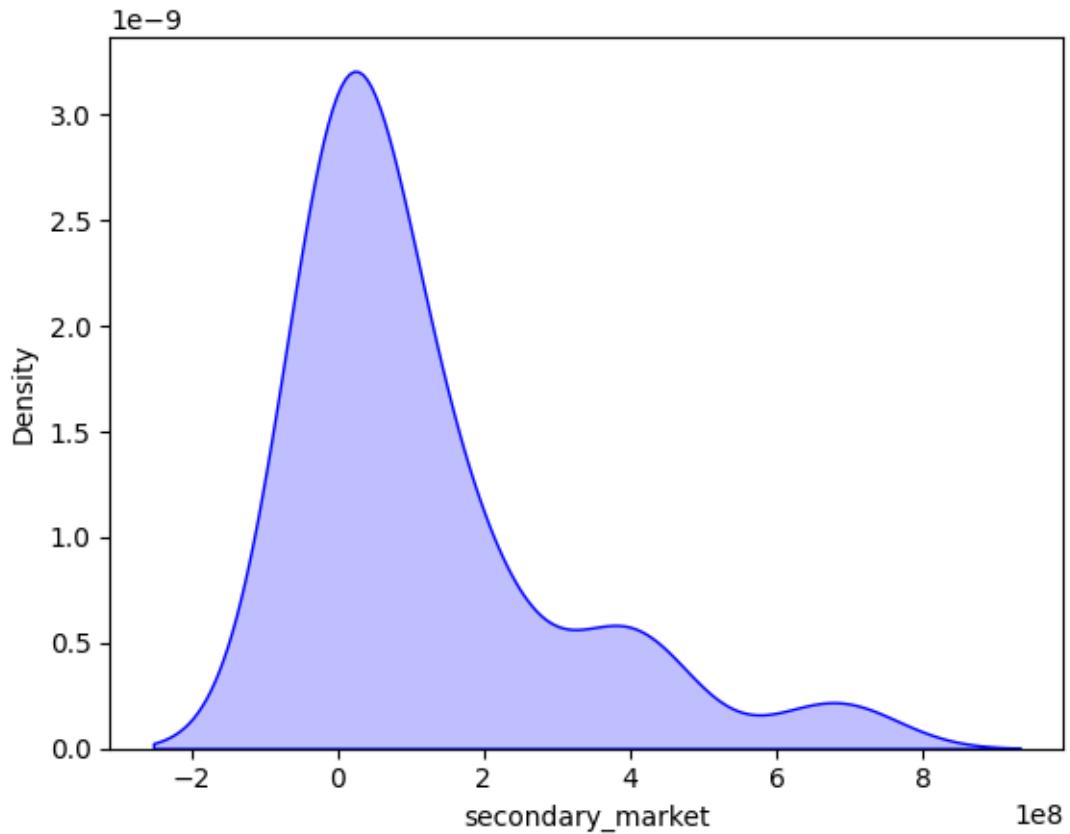
```
[ ]: sns.kdeplot(df_clean[df_clean['post_ipo_debt']!=0]['post_ipo_debt'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='post_ipo_debt', ylabel='Density'>
```



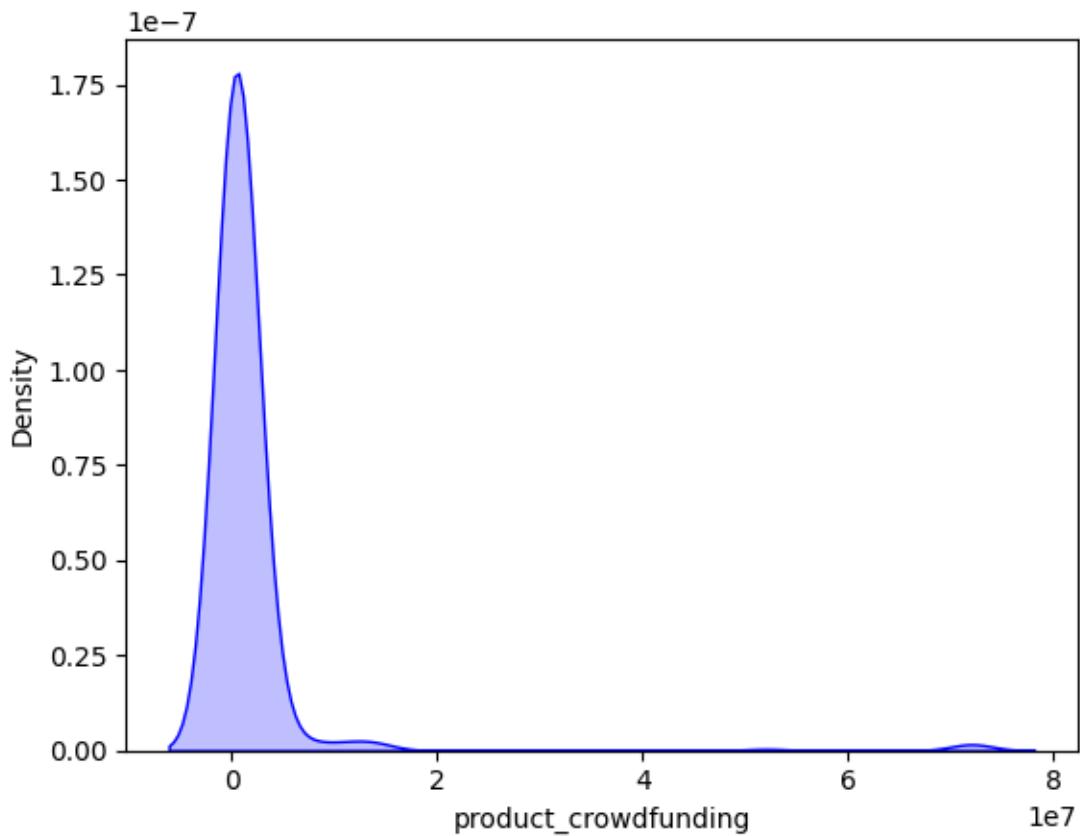
```
[ ]: sns.kdeplot(df_clean[df_clean['secondary_market']!=0]['secondary_market'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='secondary_market', ylabel='Density'>
```



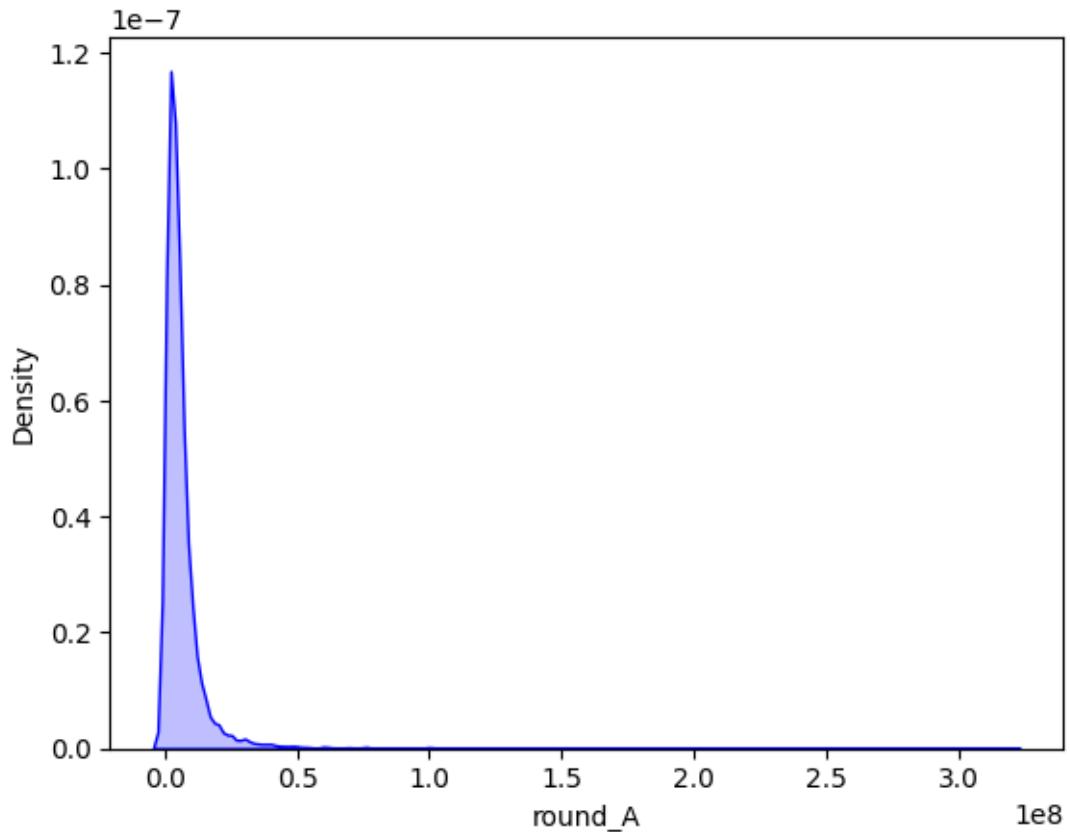
```
[ ]: sns.kdeplot(df_clean[df_clean['product_crowdfunding']!=0]['product_crowdfunding'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='product_crowdfunding', ylabel='Density'>
```



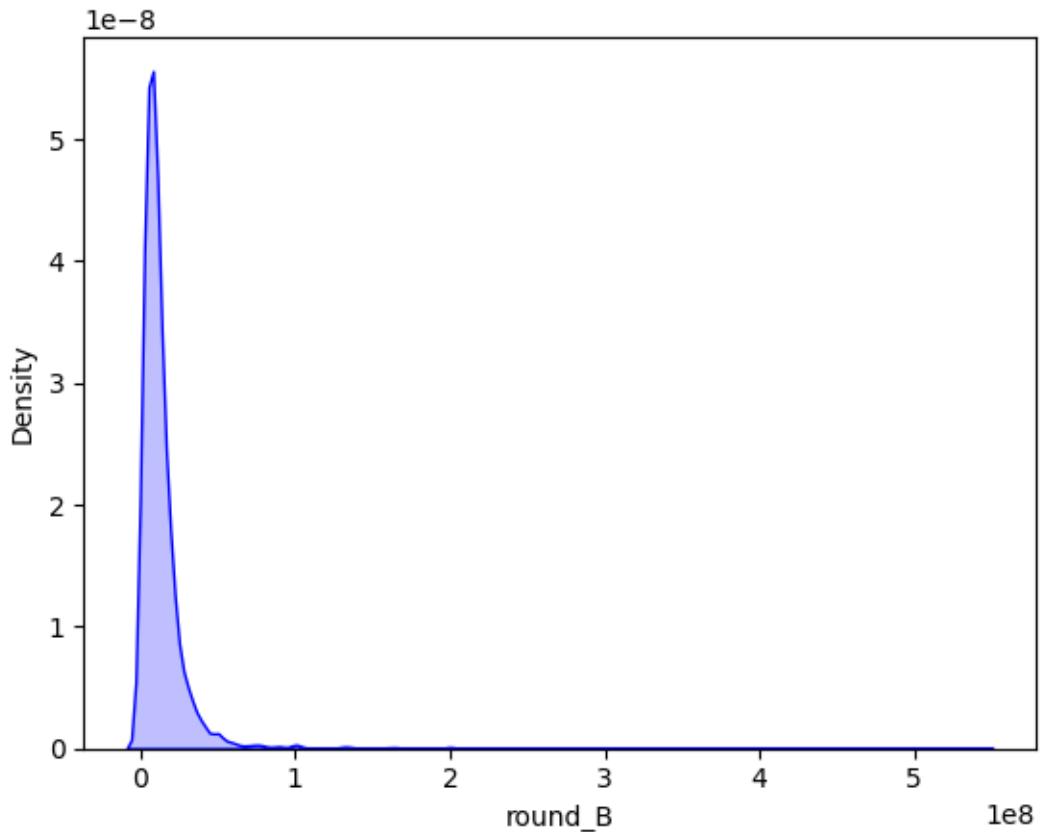
```
[ ]: sns.kdeplot(df_clean[df_clean['round_A']!=0]['round_A'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='round_A', ylabel='Density'>
```



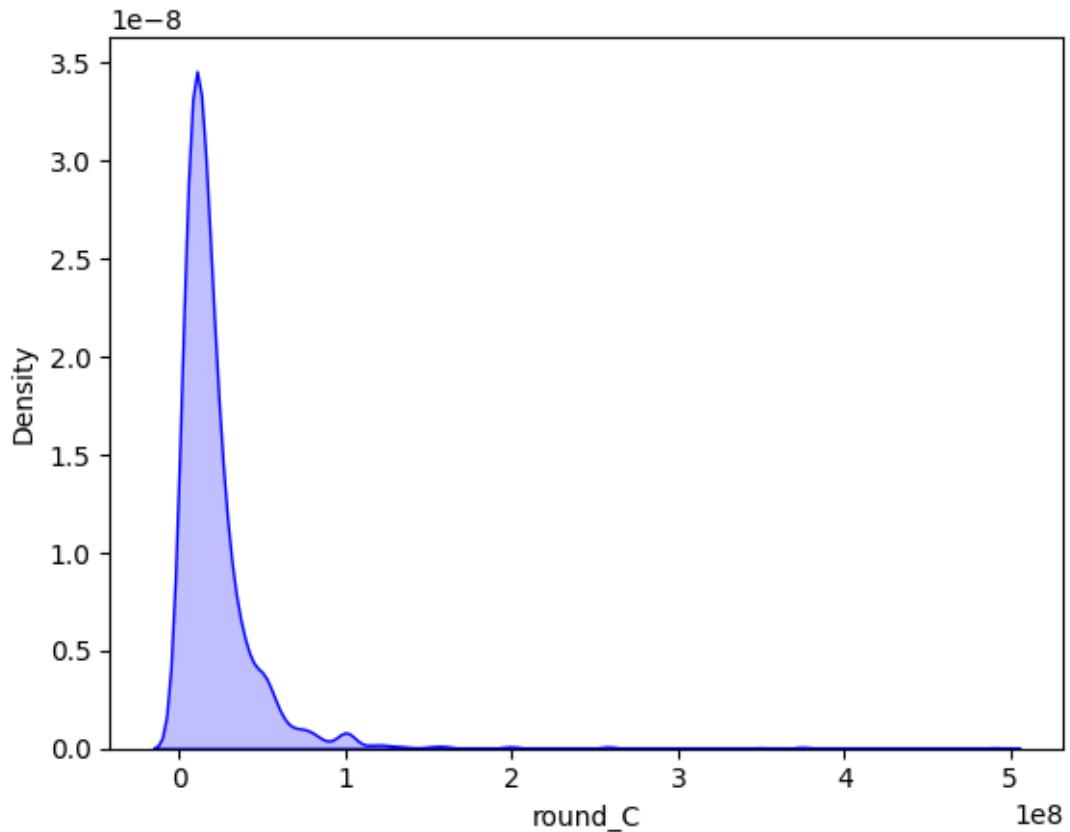
```
[ ]: sns.kdeplot(df_clean[df_clean['round_B']!=0]['round_B'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='round_B', ylabel='Density'>
```



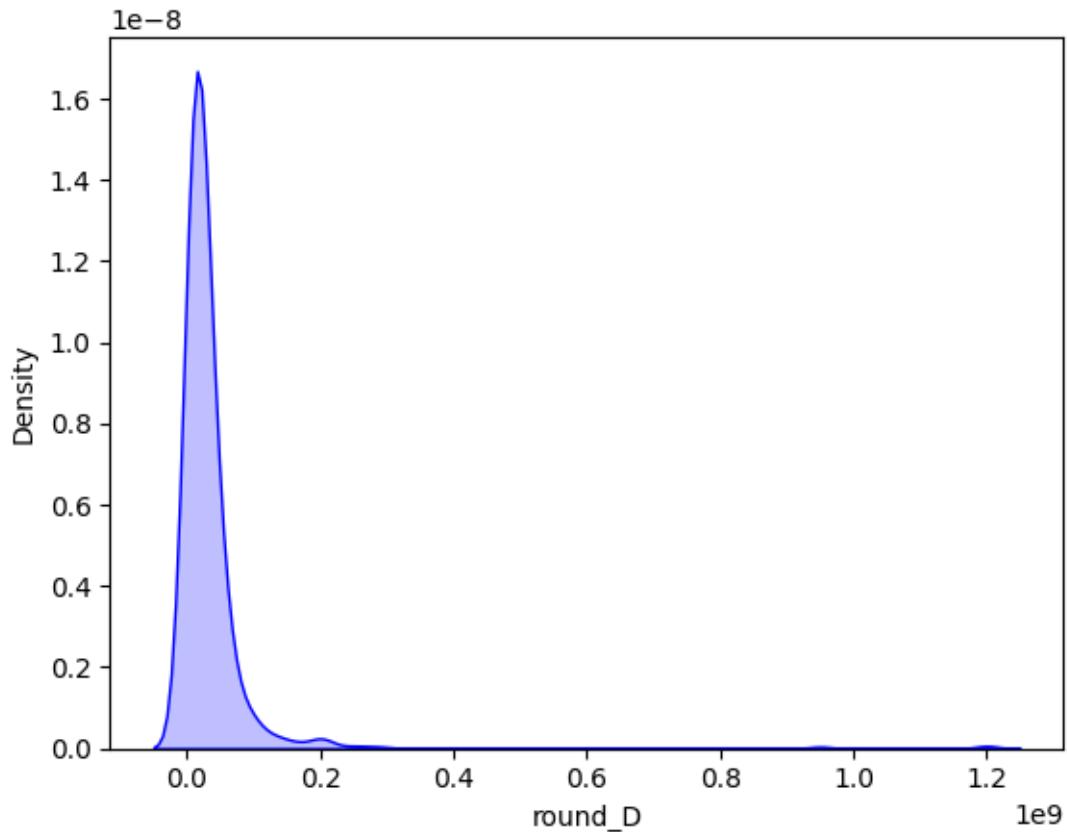
```
[ ]: sns.kdeplot(df_clean[df_clean['round_C']!=0]['round_C'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='round_C', ylabel='Density'>
```



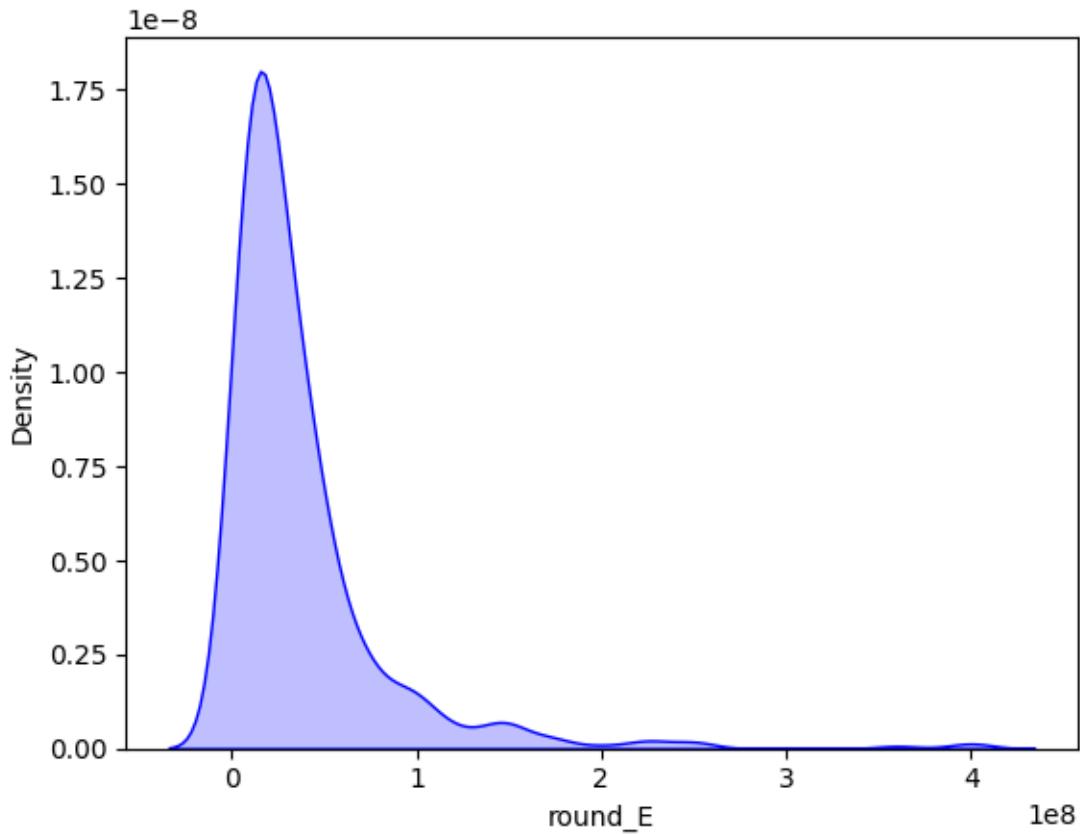
```
[ ]: sns.kdeplot(df_clean[df_clean['round_D']!=0]['round_D'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='round_D', ylabel='Density'>
```



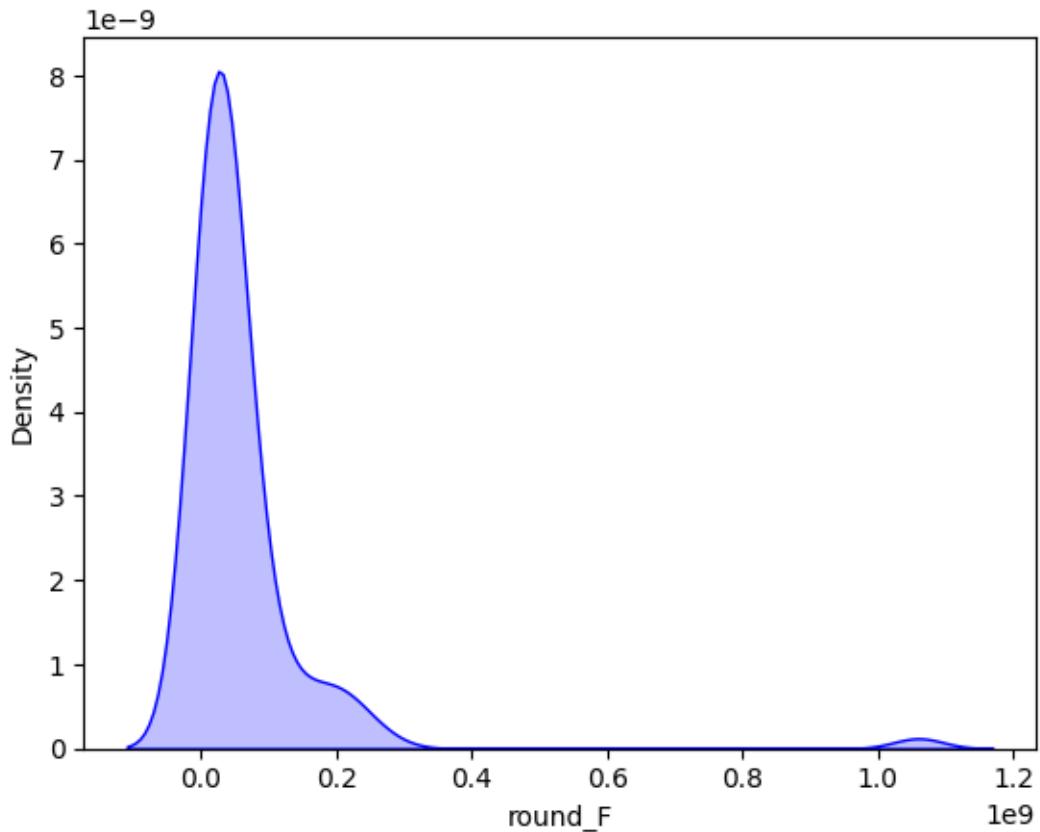
```
[ ]: sns.kdeplot(df_clean[df_clean['round_E']!=0]['round_E'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='round_E', ylabel='Density'>
```



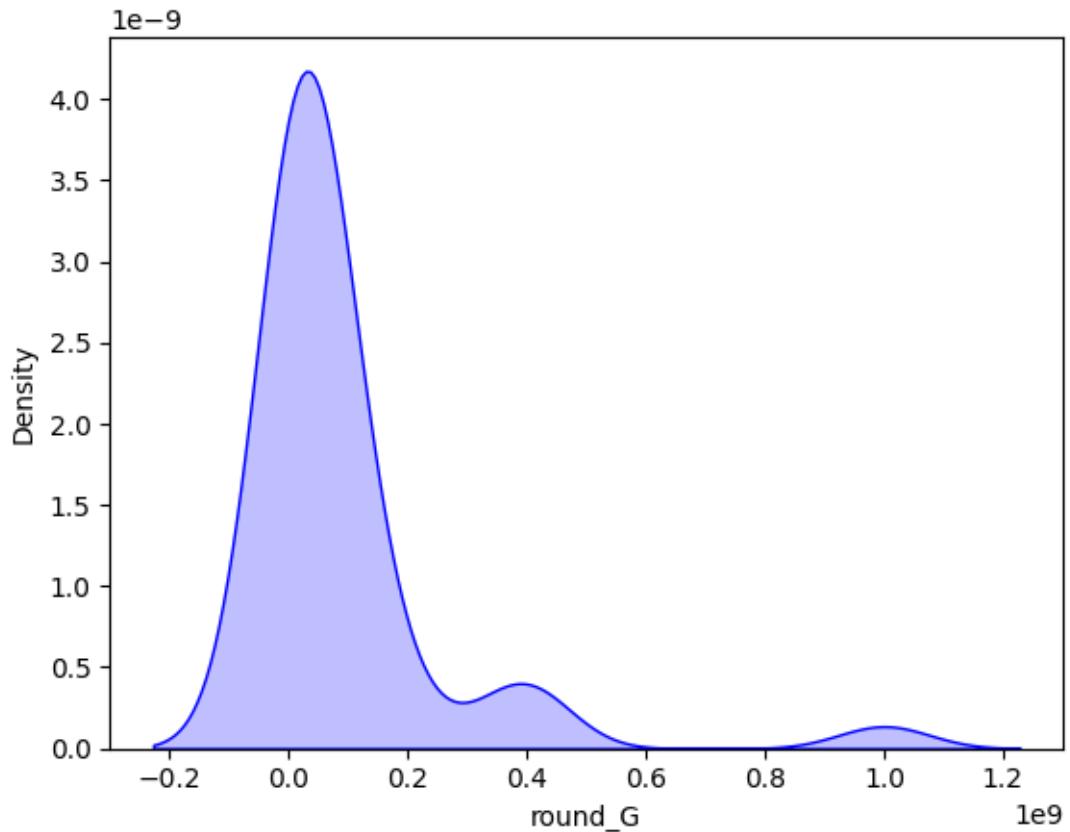
```
[ ]: sns.kdeplot(df_clean[df_clean['round_F']!=0]['round_F'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='round_F', ylabel='Density'>
```



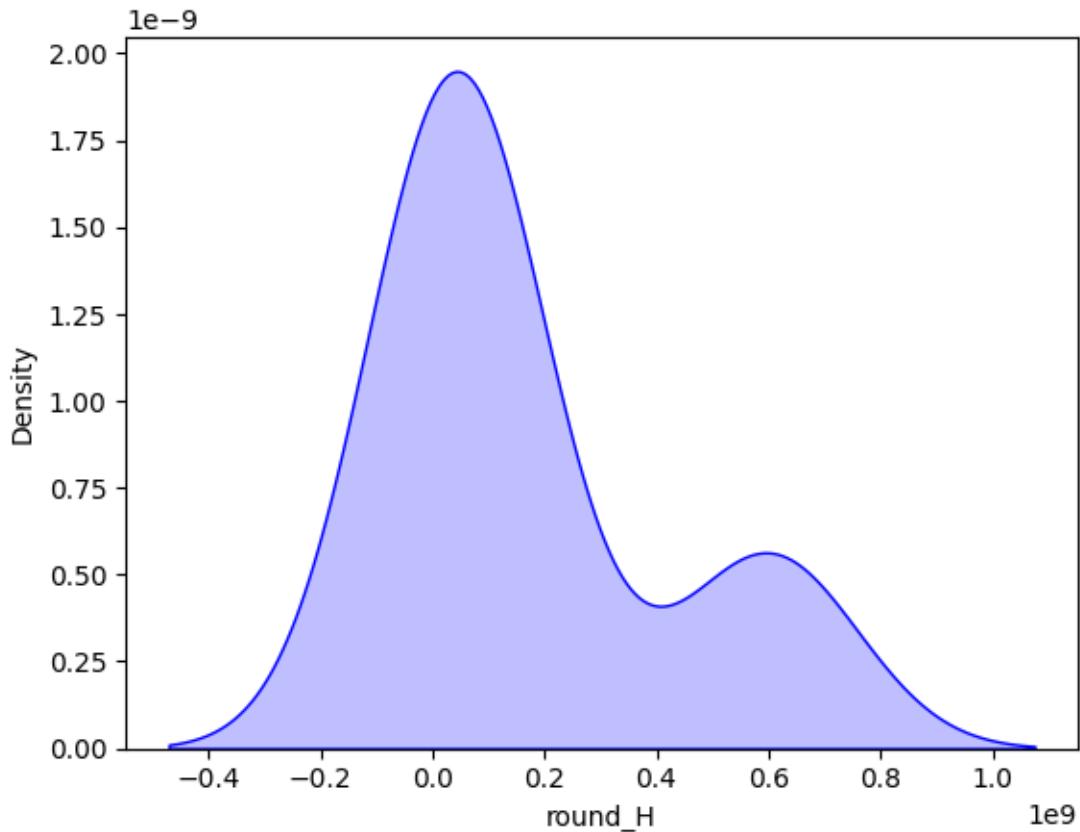
```
[ ]: sns.kdeplot(df_clean[df_clean['round_G']!=0]['round_G'], shade=True, color='b')
```

```
[ ]: <Axes: xlabel='round_G', ylabel='Density'>
```



```
[ ]: sns.kdeplot(df_clean[df_clean['round_H']!=0]['round_H'], shade=True, color='b')
```

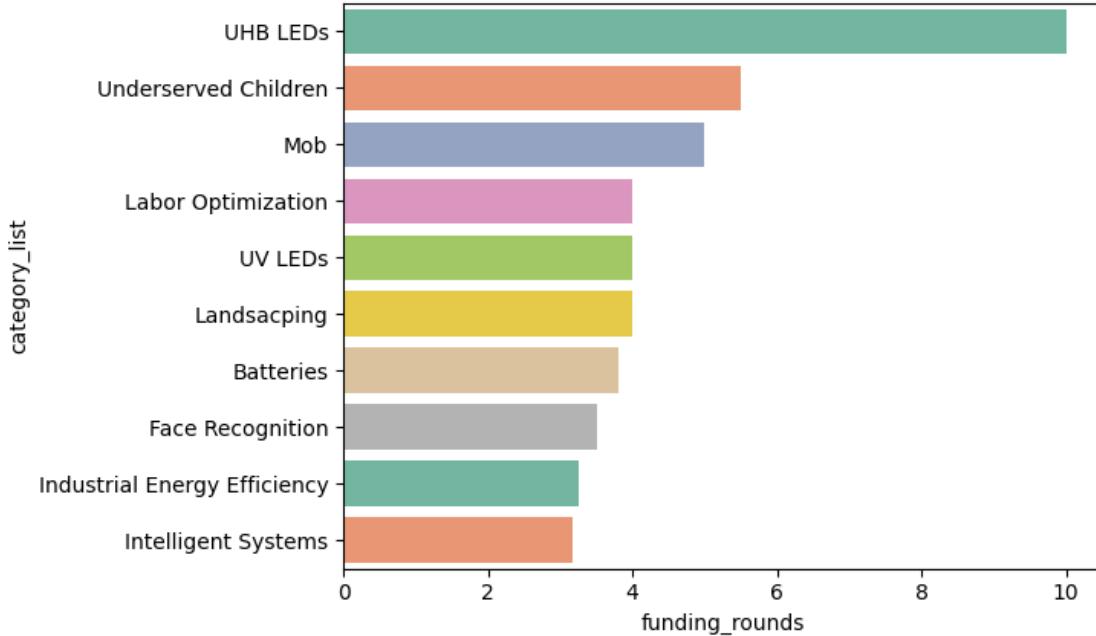
```
[ ]: <Axes: xlabel='round_H', ylabel='Density'>
```



### 1.3 Funding Rounds

```
[ ]: df_plot = df_clean.groupby('category_list').agg({'funding_rounds':'mean'})  
    .reset_index().sort_values('funding_rounds', ascending=False).head(10)  
sns.barplot(x=df_plot['funding_rounds'],  
            y=df_plot['category_list'], palette='Set2')
```

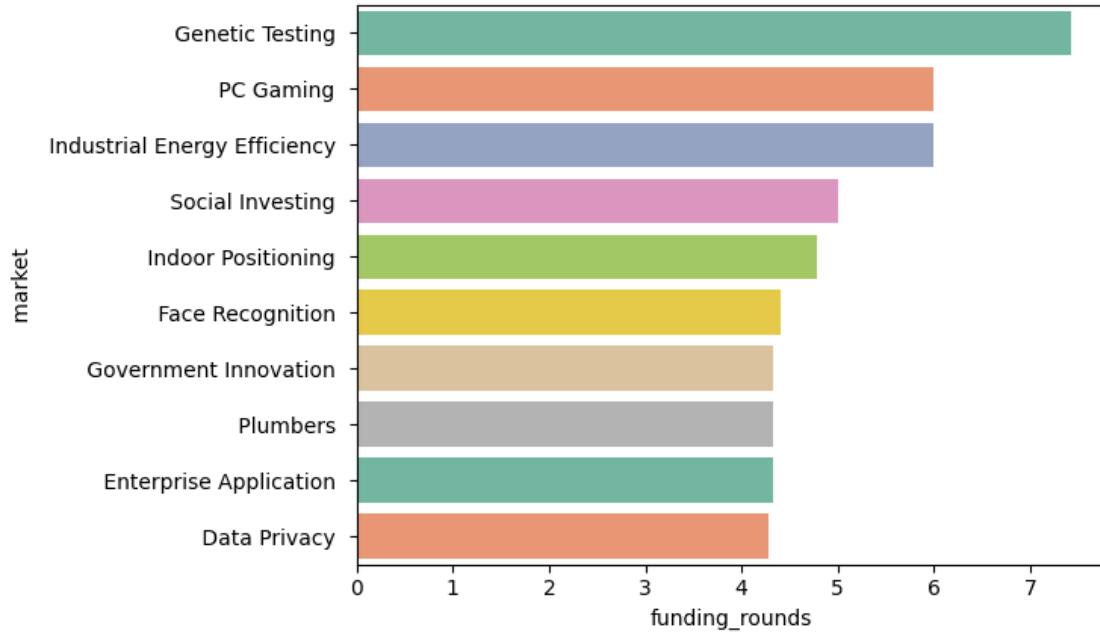
```
[ ]: <Axes: xlabel='funding_rounds', ylabel='category_list'>
```



Insights: From the plot of top 10 categories UHB LEDs have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby(' market ').agg({'funding_rounds':'mean'}).
    ↪reset_index().sort_values('funding_rounds', ascending=False).head(10)
sns.barplot(x=df_plot['funding_rounds'], y=df_plot[' market '], palette='Set2')
```

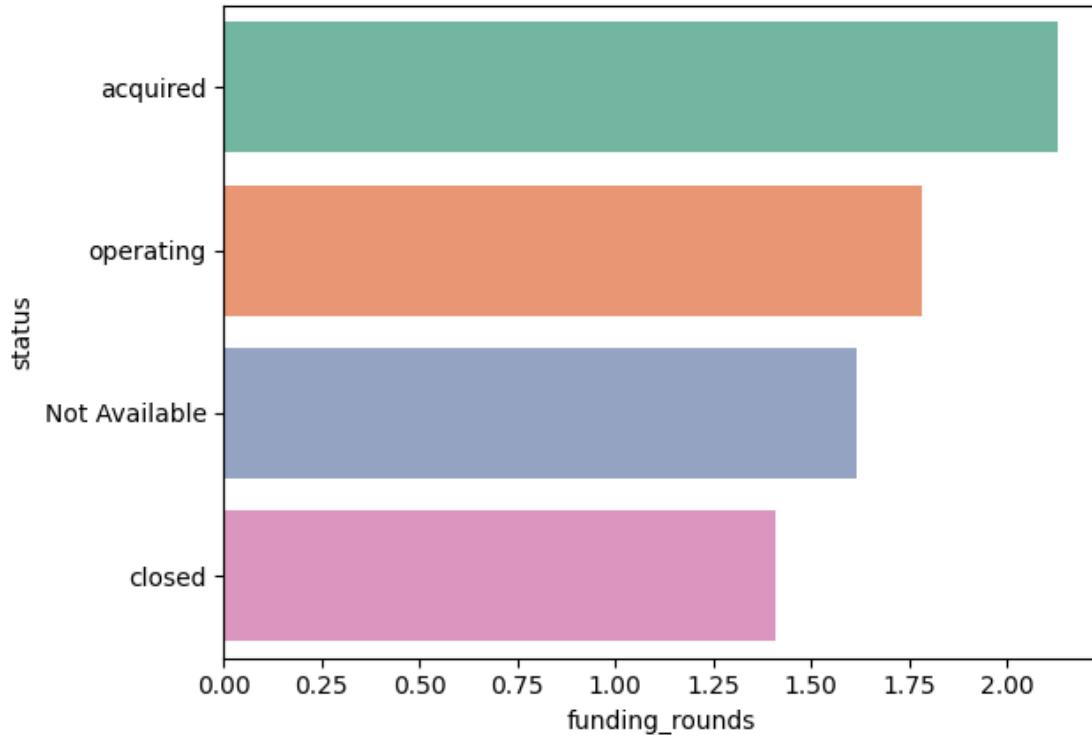
```
[ ]: <Axes: xlabel='funding_rounds', ylabel=' market '>
```



Insights: From the plot of top 10 markets Genetic Testing have the largest number of avergae funding rounds.

```
[ ]: df_plot = df_clean.groupby('status').agg({'funding_rounds':'mean'})  
    .reset_index().sort_values('funding_rounds', ascending=False).head(10)  
sns.barplot(x=df_plot['funding_rounds'], y=df_plot['status'], palette='Set2')
```

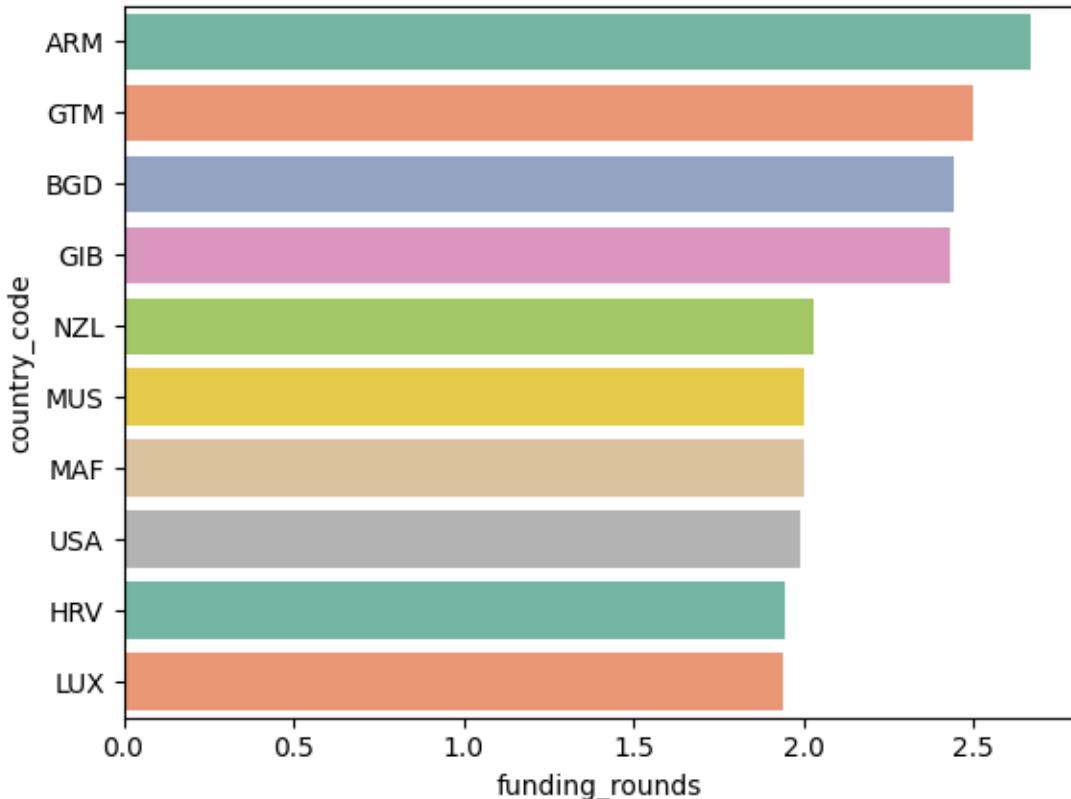
```
[ ]: <Axes: xlabel='funding_rounds', ylabel='status'>
```



Insights: From the plot of a start up status all startups that have been acquired have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('country_code').agg({'funding_rounds':'mean'})  
    .reset_index().sort_values('funding_rounds', ascending=False).head(10)  
sns.barplot(x=df_plot['funding_rounds'],  
            y=df_plot['country_code'], palette='Set2')
```

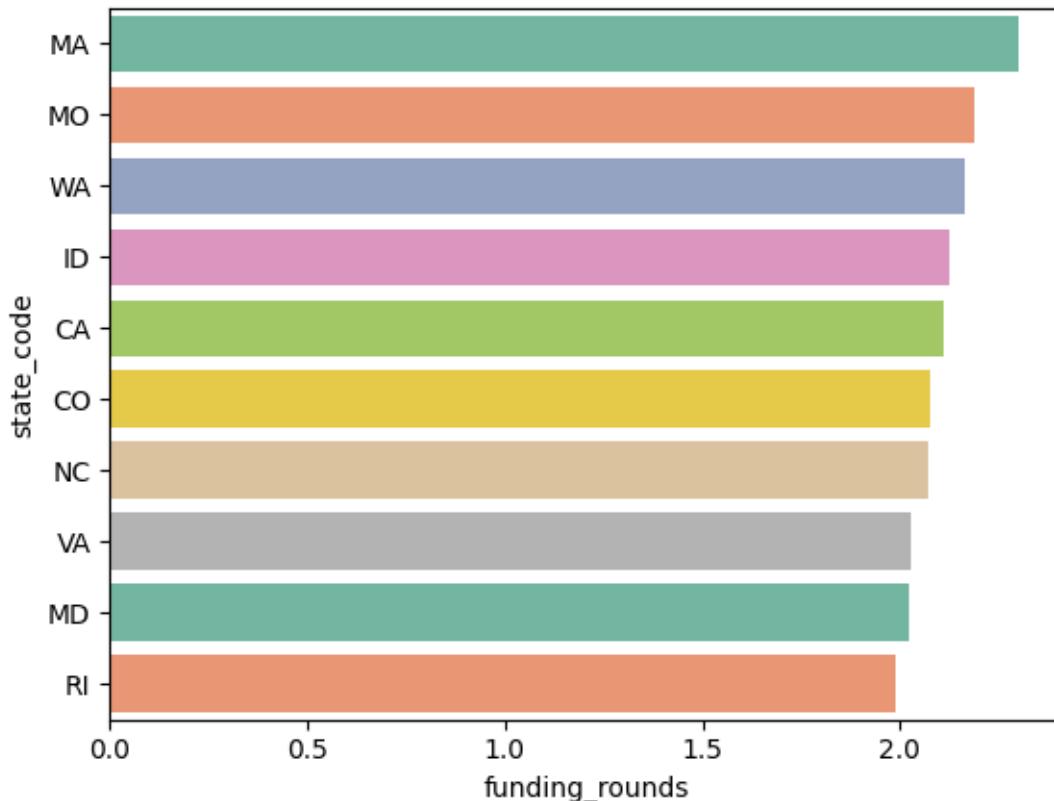
[ ]: <Axes: xlabel='funding\_rounds', ylabel='country\_code'>



Insights: From the plot of top 10 countries Armenia have the largest number of avergae funding rounds.

```
[ ]: df_plot = df_clean.groupby('state_code').agg({'funding_rounds':'mean'}).
    ↪reset_index().sort_values('funding_rounds',ascending=False).head(10)
sns.barplot(x=df_plot['funding_rounds'], y=df_plot['state_code'], palette='Set2')
```

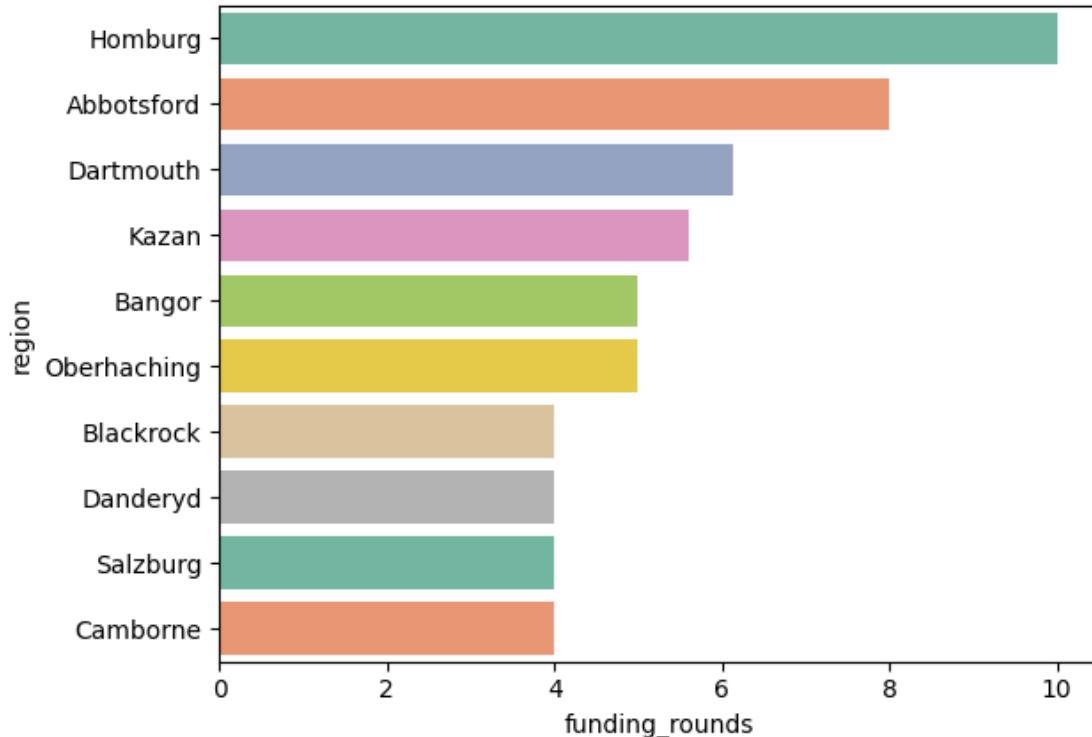
```
[ ]: <Axes: xlabel='funding_rounds', ylabel='state_code'>
```



Insights: From the plot of top 10 states Massachusetts has the largest number of avergae funding rounds.

```
[ ]: df_plot = df_clean.groupby('region').agg({'funding_rounds':'mean'})  
    .reset_index().sort_values('funding_rounds', ascending=False).head(10)  
sns.barplot(x=df_plot['funding_rounds'], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='funding_rounds', ylabel='region'>
```

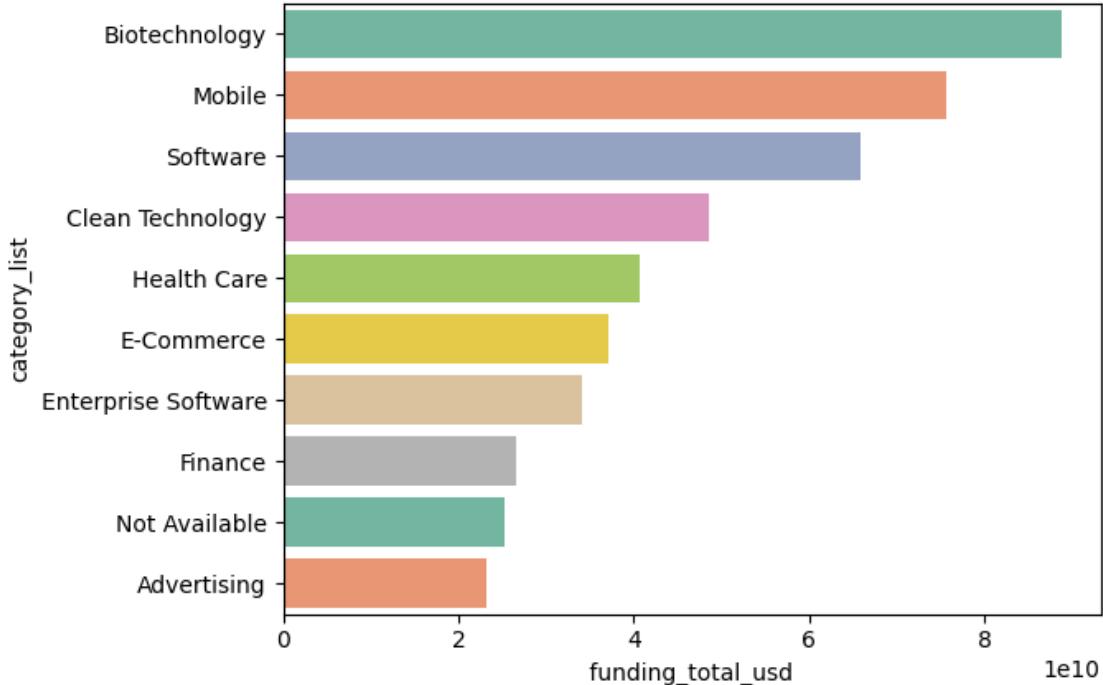


Insights: From the plot of top 10 cities Homburg has the largest number of avergae funding rounds.

## 1.4 Total Funding

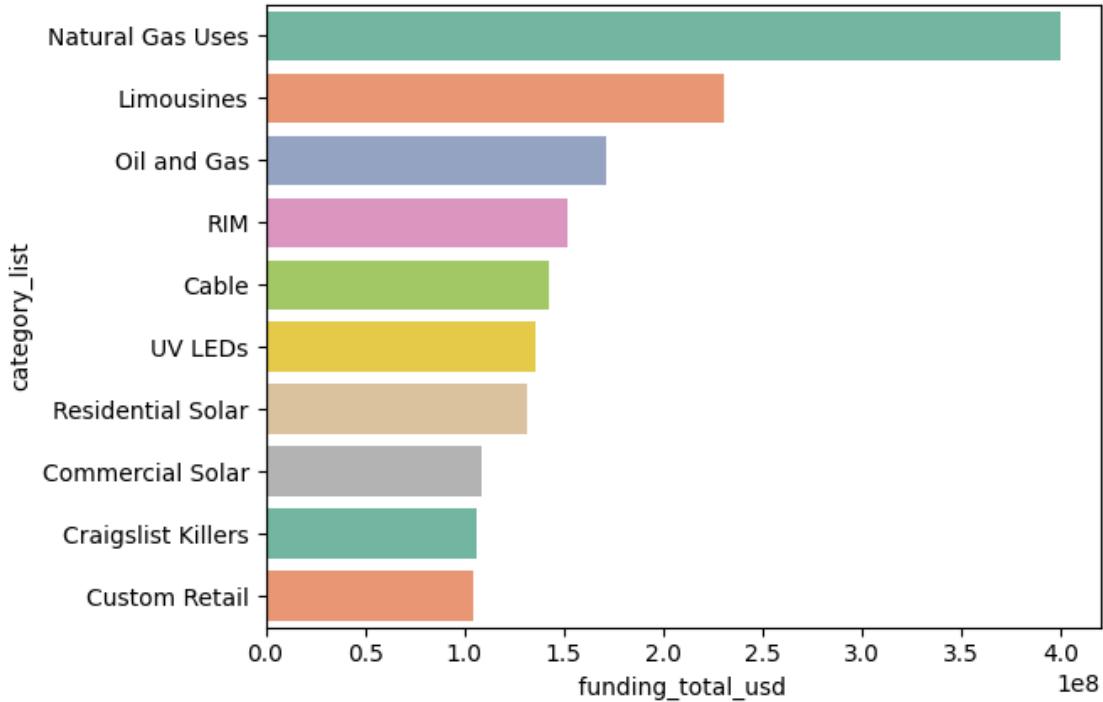
```
[ ]: df_plot = df_clean.groupby('category_list').agg({'funding_total_usd ':'sum'}).
    ↪reset_index().sort_values('funding_total_usd ',ascending=False).head(10)
sns.barplot(x=df_plot['funding_total_usd '], ↪
    ↪y=df_plot['category_list'], palette='Set2')
```

```
[ ]: <Axes: xlabel='funding_total_usd ', ylabel='category_list'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of total fundings.

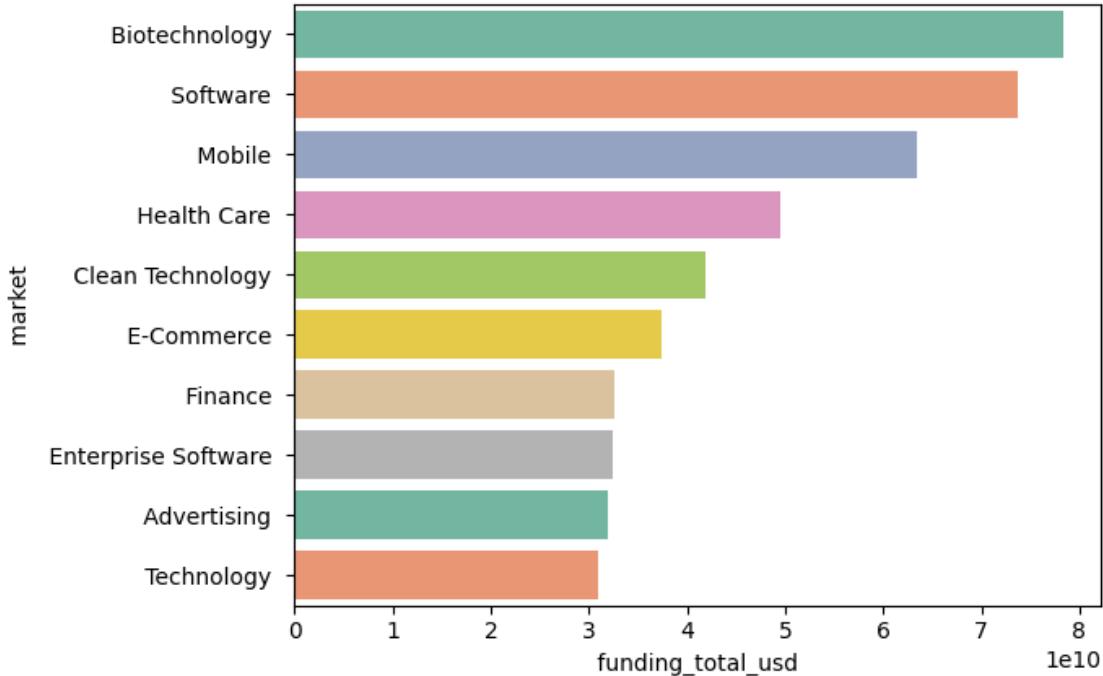
```
[ ]: df_plot = df_clean.groupby('category_list').agg({'funding_total_usd ':'mean'})  
    .reset_index().sort_values('funding_total_usd ',ascending=False).head(10)  
sns.barplot(x=df_plot['funding_total_usd '],  
            y=df_plot['category_list'],palette='Set2')  
  
[ ]: <Axes: xlabel=' funding_total_usd ', ylabel='category_list'>
```



Insights: From the plot of top 10 categories Natural Gas Uses have the largest number of average fundings.

```
[ ]: df_plot = df_clean.groupby(' market ').agg({' funding_total_usd ':'sum'}).
    ↪reset_index().sort_values(' funding_total_usd ',ascending=False).head(10)
sns.barplot(x=df_plot[' funding_total_usd '], y=df_plot[' market '],
    ↪] ,palette='Set2')
```

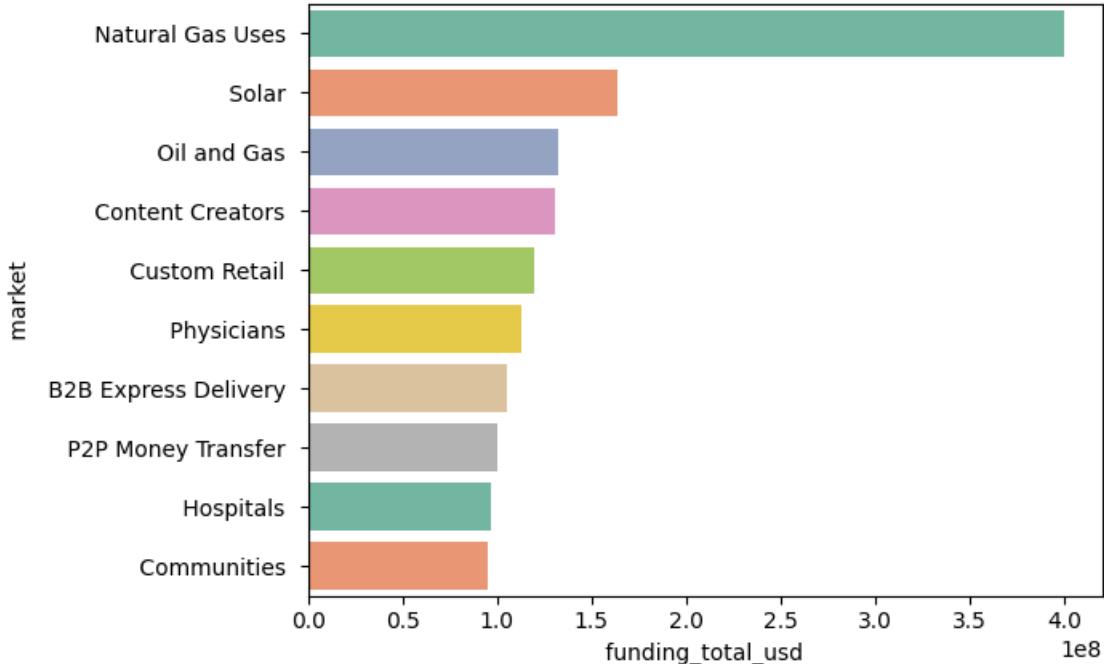
```
[ ]: <Axes: xlabel=' funding_total_usd ', ylabel=' market '>
```



Insights: From the plot of top 10 markets Biotechnology have the largest number of total fundings.

```
[ ]: df_plot = df_clean.groupby(' market ').agg({' funding_total_usd ':'mean'}).
    ↪reset_index().sort_values(' funding_total_usd ',ascending=False).head(10)
sns.barplot(x=df_plot[' funding_total_usd '], y=df_plot[' market '],
    ↪], palette='Set2')
```

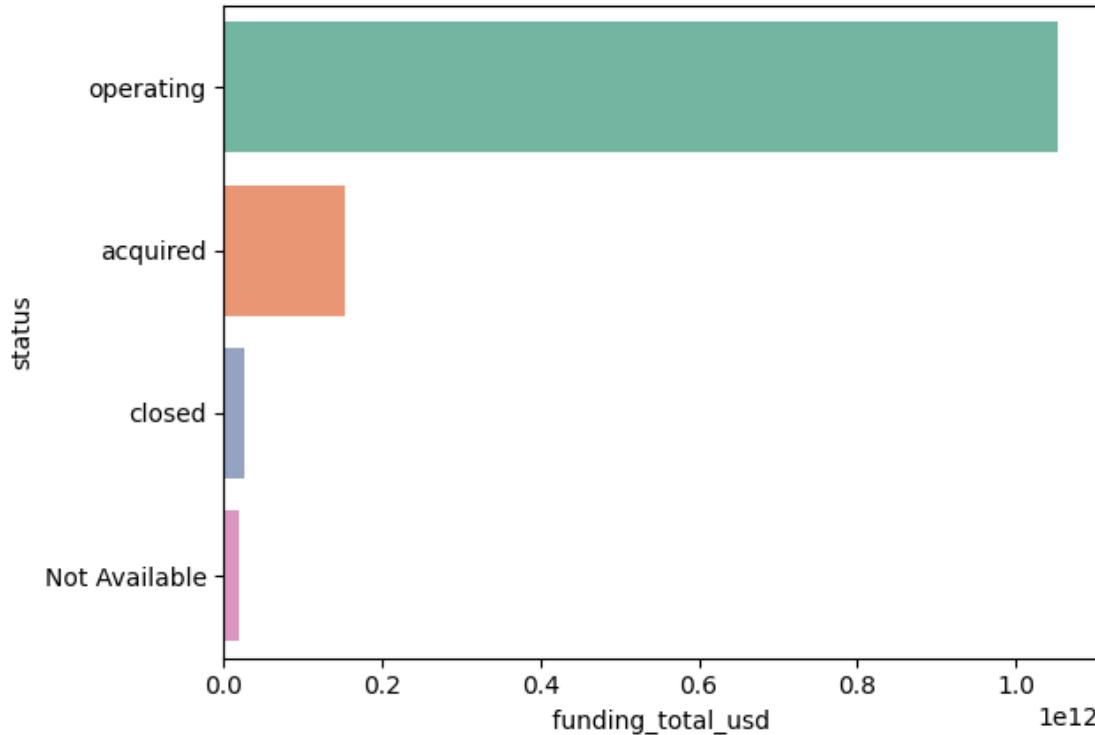
```
[ ]: <Axes: xlabel=' funding_total_usd ', ylabel=' market '>
```



Insights: From the plot of top 10 markets Natural Gas Uses have the largest number of average fundings.

```
[ ]: df_plot = df_clean.groupby('status').agg({'funding_total_usd ':'sum'}).
    ↪reset_index().sort_values('funding_total_usd ',ascending=False).head(10)
sns.barplot(x=df_plot['funding_total_usd '], ↪
    ↪y=df_plot['status'],palette='Set2')
```

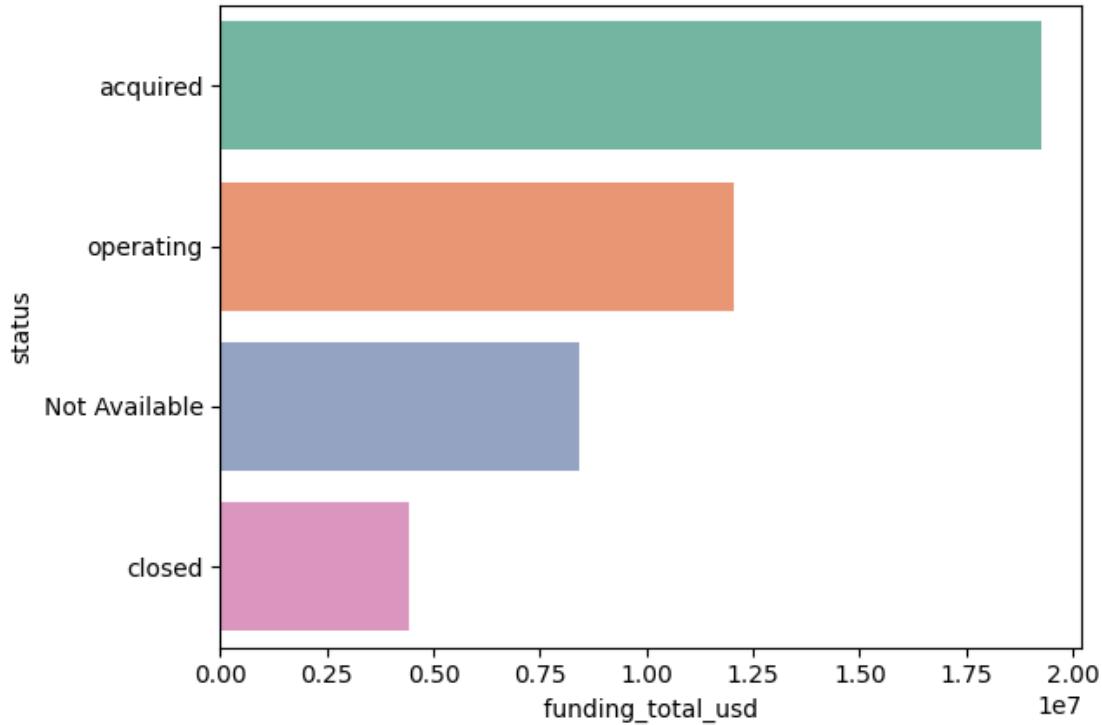
```
[ ]: <Axes: xlabel='funding_total_usd ', ylabel='status'>
```



Insights: From the status plot Operating startups have the largest number of total fundings.

```
[ ]: df_plot = df_clean.groupby('status').agg({'funding_total_usd ':'mean'}).
    ↪reset_index().sort_values('funding_total_usd ',ascending=False).head(10)
sns.barplot(x=df_plot['funding_total_usd '], ↪
    ↪y=df_plot['status'], palette='Set2')

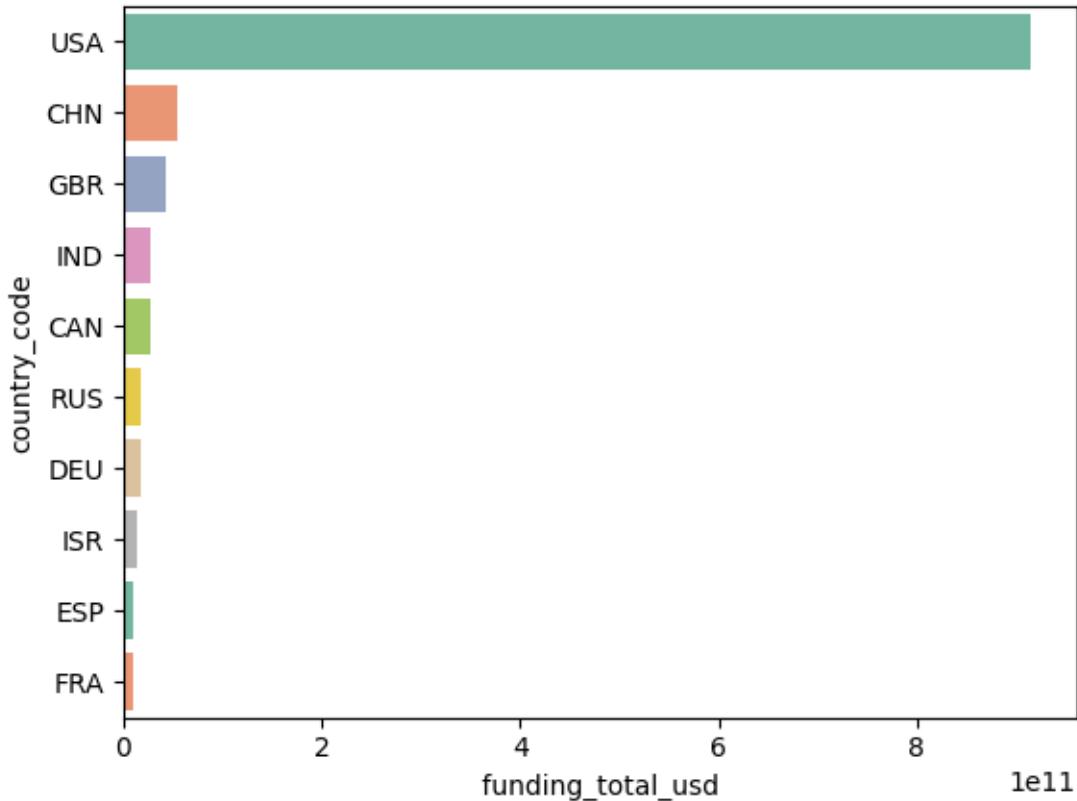
[ ]: <Axes: xlabel=' funding_total_usd ', ylabel='status'>
```



Insights: From the status plot acquired startups have the largest number of average fundings.

```
[ ]: df_plot = df_clean.groupby('country_code').agg({'funding_total_usd ':'sum'}).
    ↪reset_index().sort_values('funding_total_usd ',ascending=False).head(11)
df_plot = df_plot[df_plot['country_code']!='Not Available']
sns.barplot(x=df_plot['funding_total_usd '], ↪
    ↪y=df_plot['country_code'],palette='Set2')
```

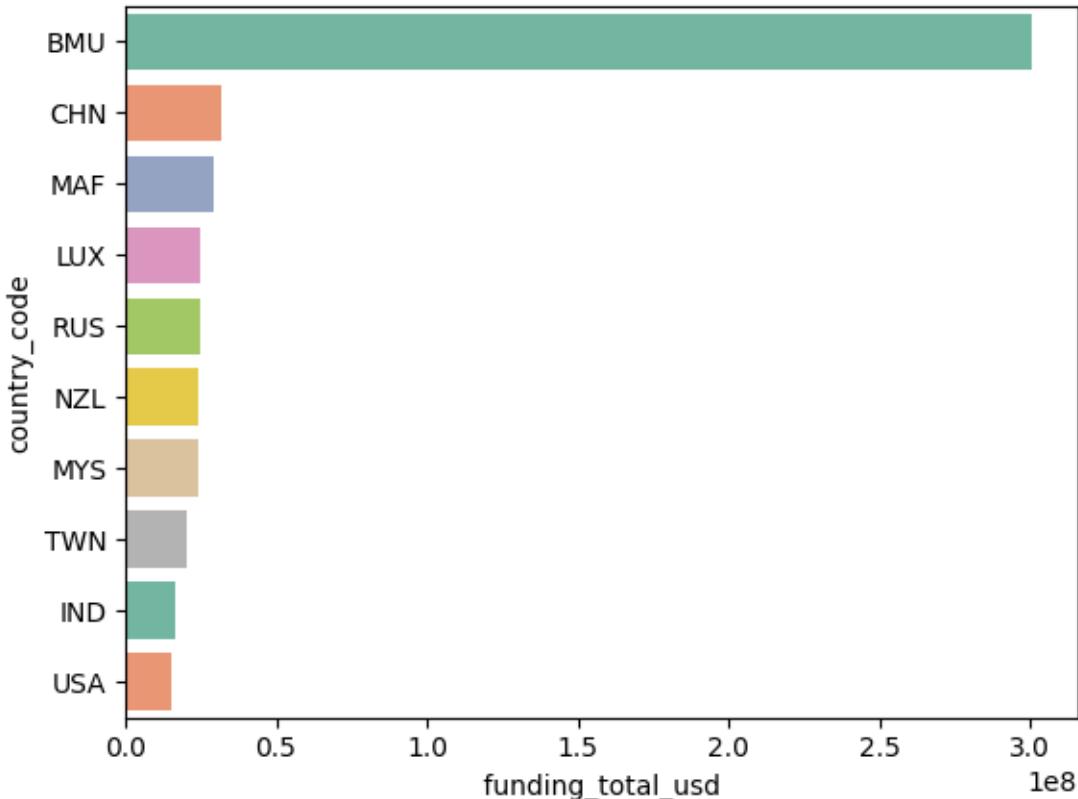
```
[ ]: <Axes: xlabel='funding_total_usd ', ylabel='country_code'>
```



Insights: From the plot of top 10 countries USA has the largest number of total fundings.

```
[ ]: df_plot = df_clean.groupby('country_code').agg({'funding_total_usd ':'mean'}).reset_index().sort_values('funding_total_usd ',ascending=False).head(10)
df_plot = df_plot[df_plot['country_code']!='Not Available']
sns.barplot(x=df_plot['funding_total_usd '],y=df_plot['country_code'],palette='Set2')

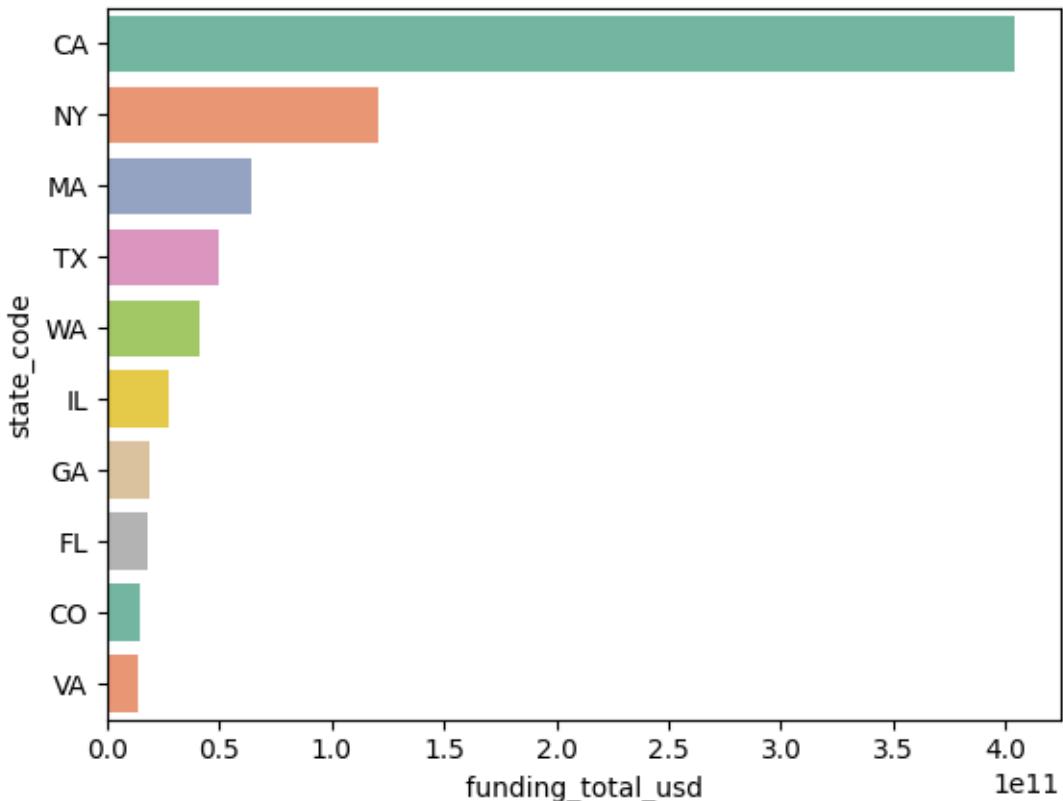
[ ]: <Axes: xlabel=' funding_total_usd ', ylabel='country_code'>
```



Insights: From the plot of top 10 countries Bermuda have the largest number of avergae fundings.

```
[ ]: df_plot = df_clean.groupby('state_code').agg({'funding_total_usd ':'sum'}).
    ↪reset_index().sort_values('funding_total_usd ',ascending=False).head(11)
df_plot = df_plot[df_plot['state_code']!='Not Available']
sns.barplot(x=df_plot['funding_total_usd'], ↪
    ↪y=df_plot['state_code'],palette='Set2')

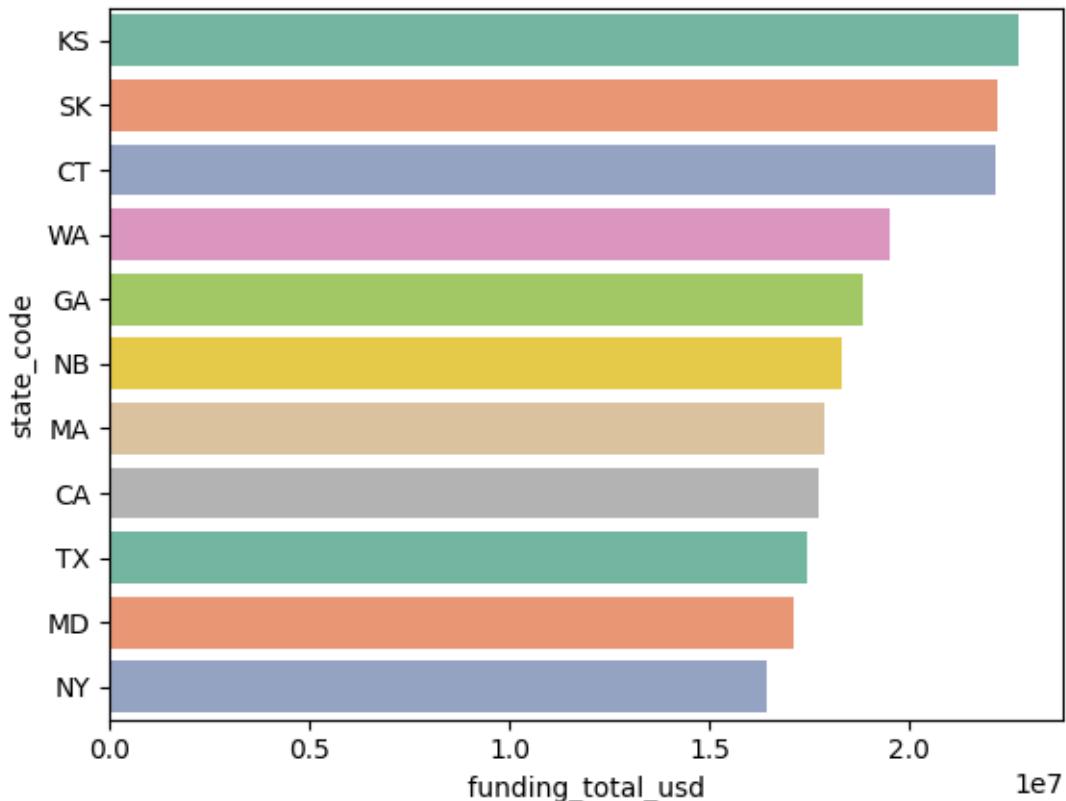
[ ]: <Axes: xlabel='funding_total_usd ', ylabel='state_code'>
```



Insights: From the plot of top 10 states California has the largest number of total fundings.

```
[ ]: df_plot = df_clean.groupby('state_code').agg({'funding_total_usd ':'mean'}).
    ↪reset_index().sort_values('funding_total_usd ',ascending=False).head(11)
df_plot = df_plot[df_plot['state_code']!='Not Available']
sns.barplot(x=df_plot['funding_total_usd '], ↪
    ↪y=df_plot['state_code'],palette='Set2')

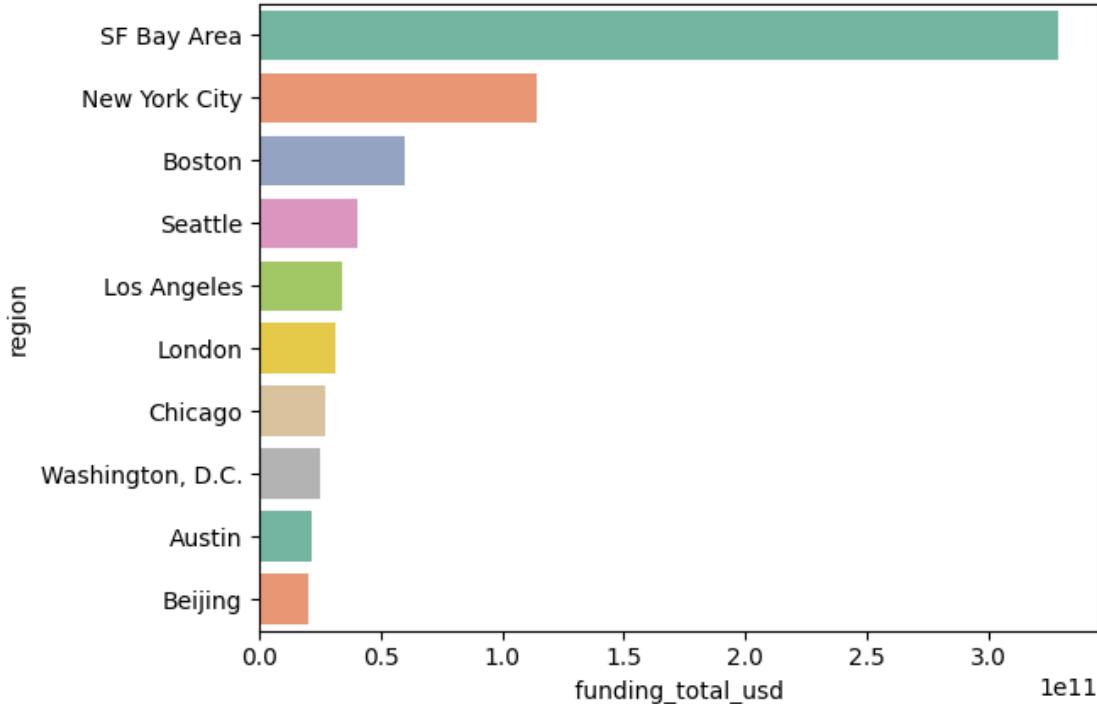
[ ]: <Axes: xlabel='funding_total_usd ', ylabel='state_code'>
```



Insights: From the plot of top 10 states Kansas has the largest number of average fundings.

```
[ ]: df_plot = df_clean.groupby('region').agg({'funding_total_usd ':'sum'}).
    ↪reset_index().sort_values('funding_total_usd ',ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot['funding_total_usd '], ↪
    ↪y=df_plot['region'], palette='Set2')
```

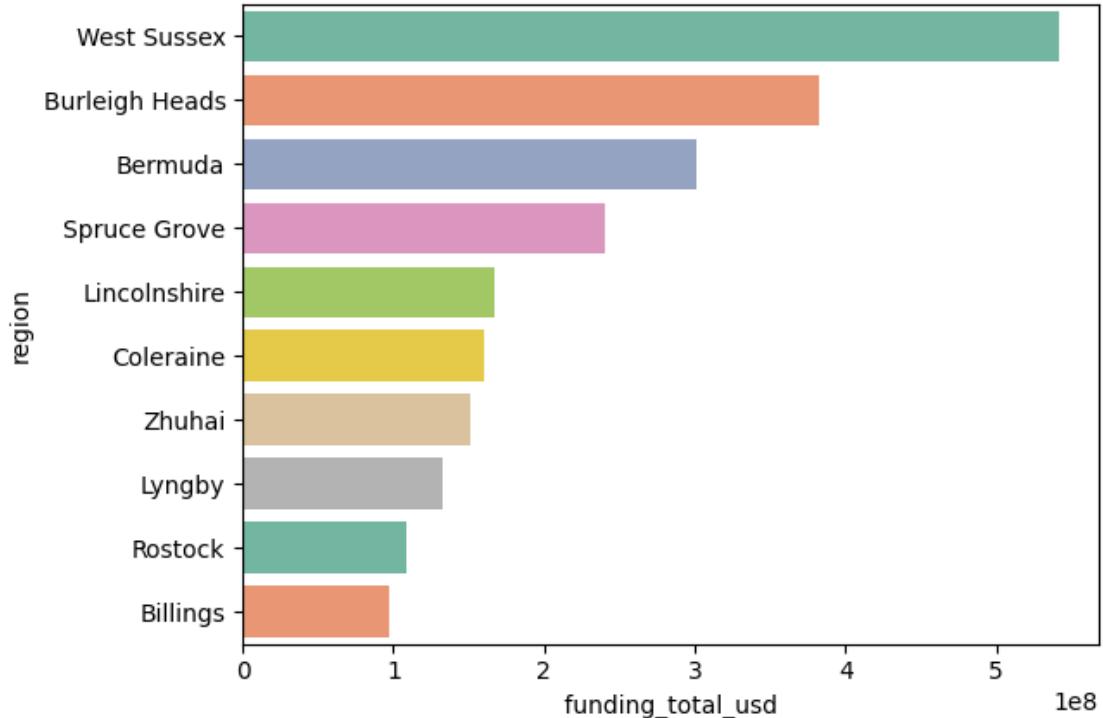
```
[ ]: <Axes: xlabel=' funding_total_usd ', ylabel='region'>
```



Insights: From the plot of top 10 cities SF Bay Area has the largest number of total fundings.

```
[ ]: df_plot = df_clean.groupby('region').agg({'funding_total_usd ':'mean'}).
    ↪reset_index().sort_values('funding_total_usd ',ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot['funding_total_usd '],_
    ↪y=df_plot['region'],palette='Set2')

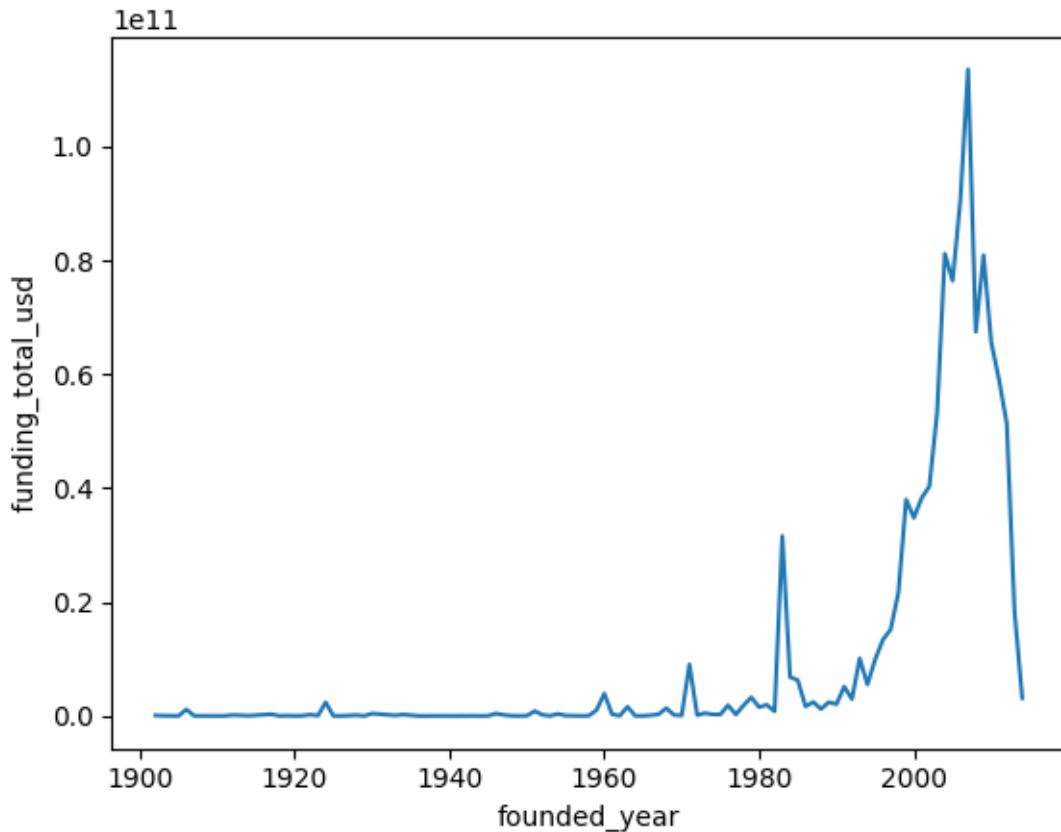
[ ]: <Axes: xlabel=' funding_total_usd ', ylabel='region'>
```



Insights: From the plot of top 10 cities West Sussex has the largest number of average fundings.

```
[ ]: df_plot = df_clean.groupby('founded_year').agg({'funding_total_usd ':'sum'}).
      ↪reset_index().sort_values('funding_total_usd ',ascending=False)
df_plot = df_plot[df_plot['founded_year'] > 1000]
sns.lineplot(y=df_plot['funding_total_usd '], x=df_plot['founded_year'])
```

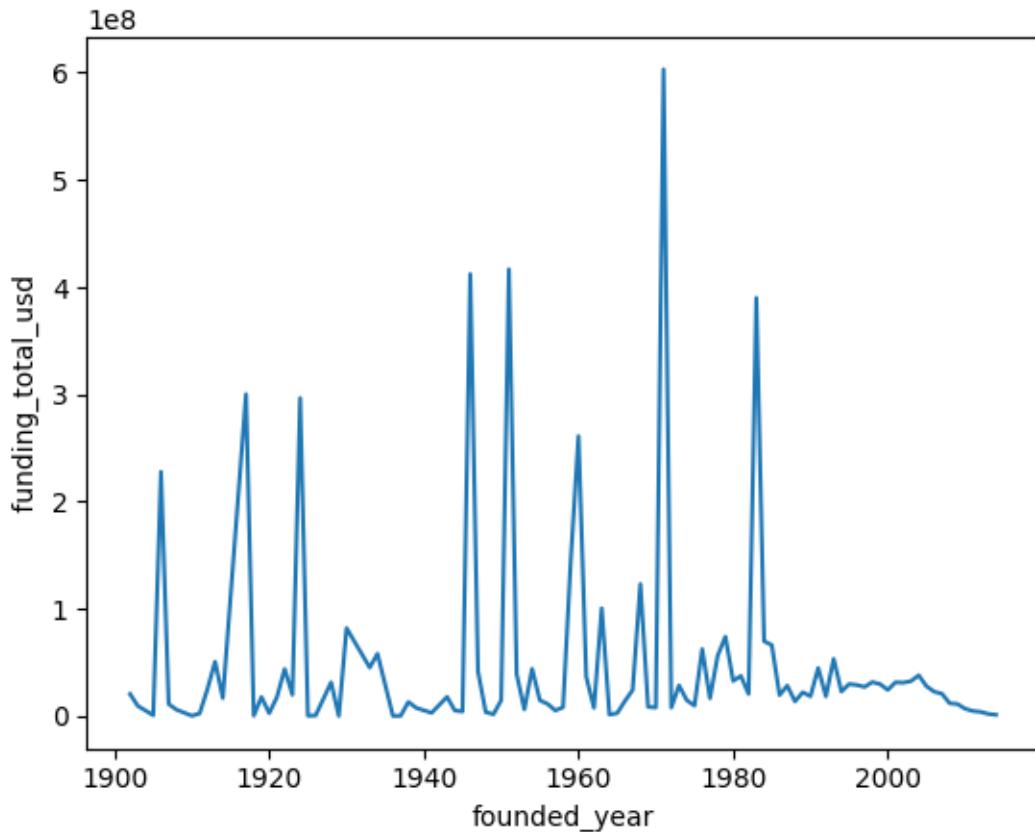
```
[ ]: <Axes: xlabel='founded_year', ylabel=' funding_total_usd '>
```



Insights: From the above trend it can be seen that startups founded in the 21st century received the largest amount of total fundings.

```
[ ]: df_plot = df_clean.groupby('founded_year').agg({'funding_total_usd ':'mean'}).
      ↪reset_index().sort_values('funding_total_usd ',ascending=False)
df_plot = df_plot[df_plot['founded_year'] > 1000]
sns.lineplot(y=df_plot['funding_total_usd'], x=df_plot['founded_year'])
```

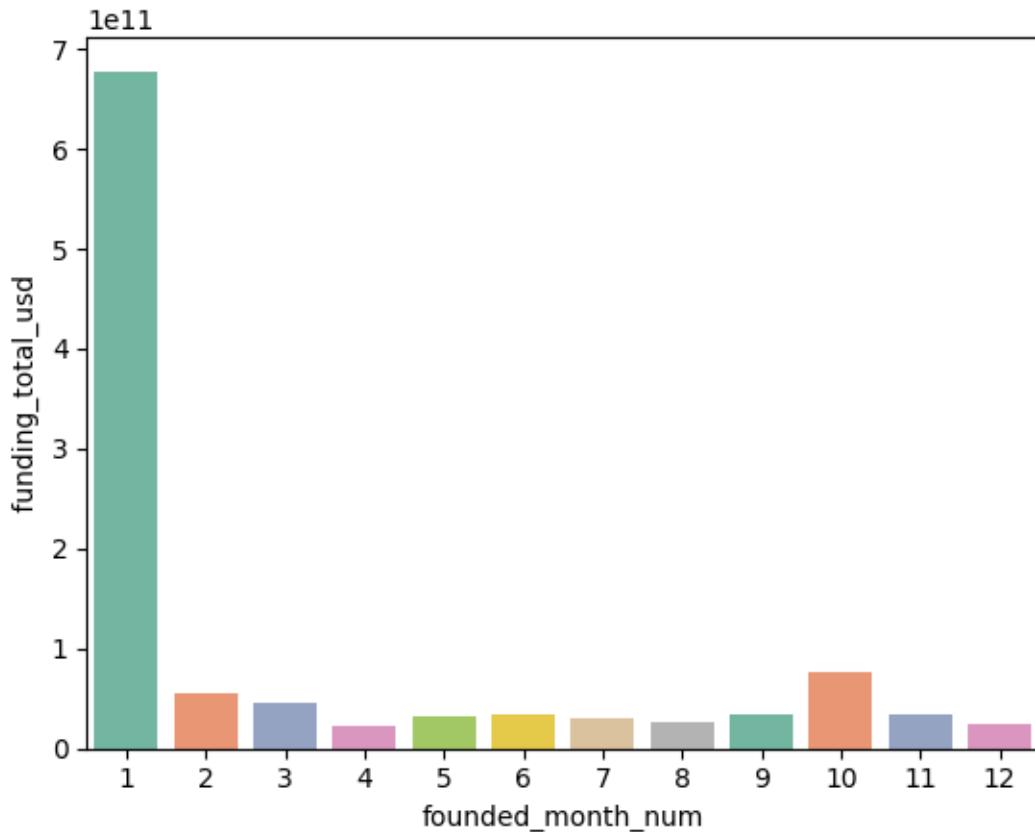
```
[ ]: <Axes: xlabel='founded_year', ylabel='funding_total_usd '>
```



Insights: The average plot indicates that large number of startups were found in the 21st century while over the years from 1900 quite alot of start ups have attracted good amount of fundings

```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({'funding_total_usd' :  
    ↴'sum'}).reset_index().sort_values('funding_total_usd', ascending=False)  
df_plot = df_plot[df_plot['founded_month_num'] > 0]  
sns.barplot(y=df_plot['funding_total_usd'],  
    ↴x=df_plot['founded_month_num'], palette='Set2')
```

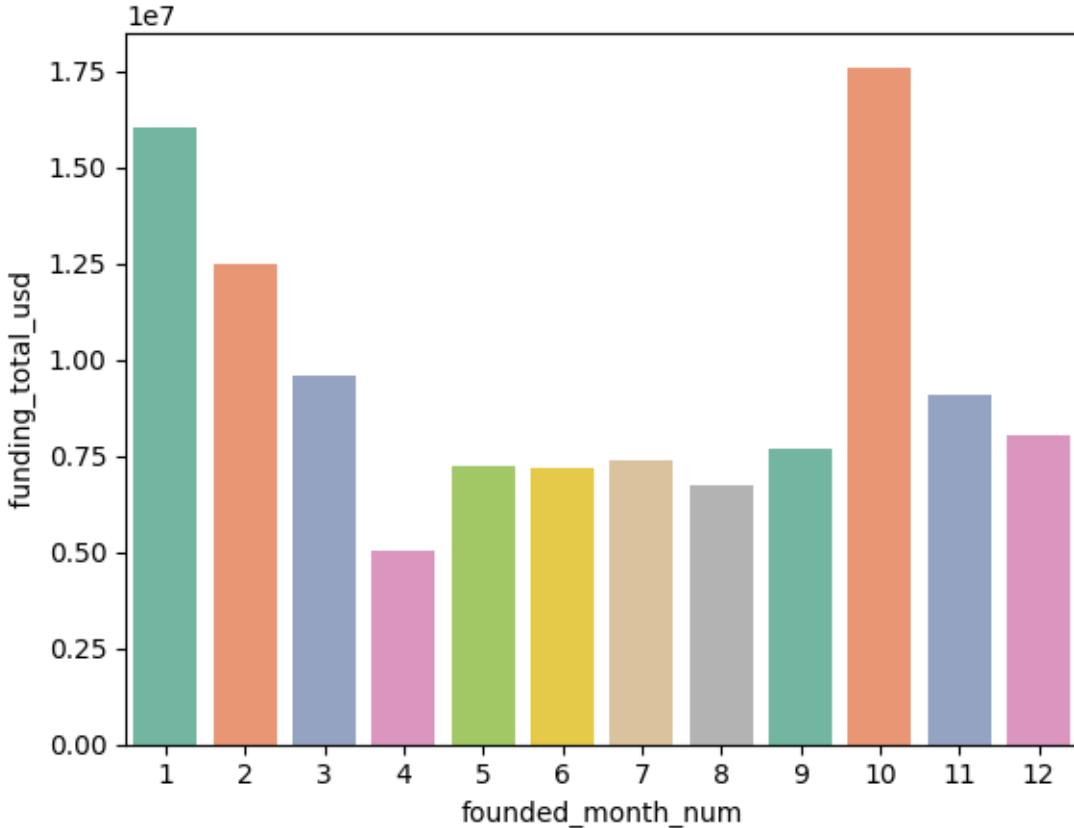
```
[ ]: <Axes: xlabel='founded_month_num', ylabel=' funding_total_usd '>
```



Insights: From the above plot it can be seen that start ups founded in the month of January have attracted the most amount of fundings

```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({'funding_total_usd' :  
    ↪ 'mean'}).reset_index().sort_values('funding_total_usd', ascending=False)  
df_plot = df_plot[df_plot['founded_month_num'] > 0]  
sns.barplot(y=df_plot['funding_total_usd'],  
    ↪ x=df_plot['founded_month_num'], palette='Set2')
```

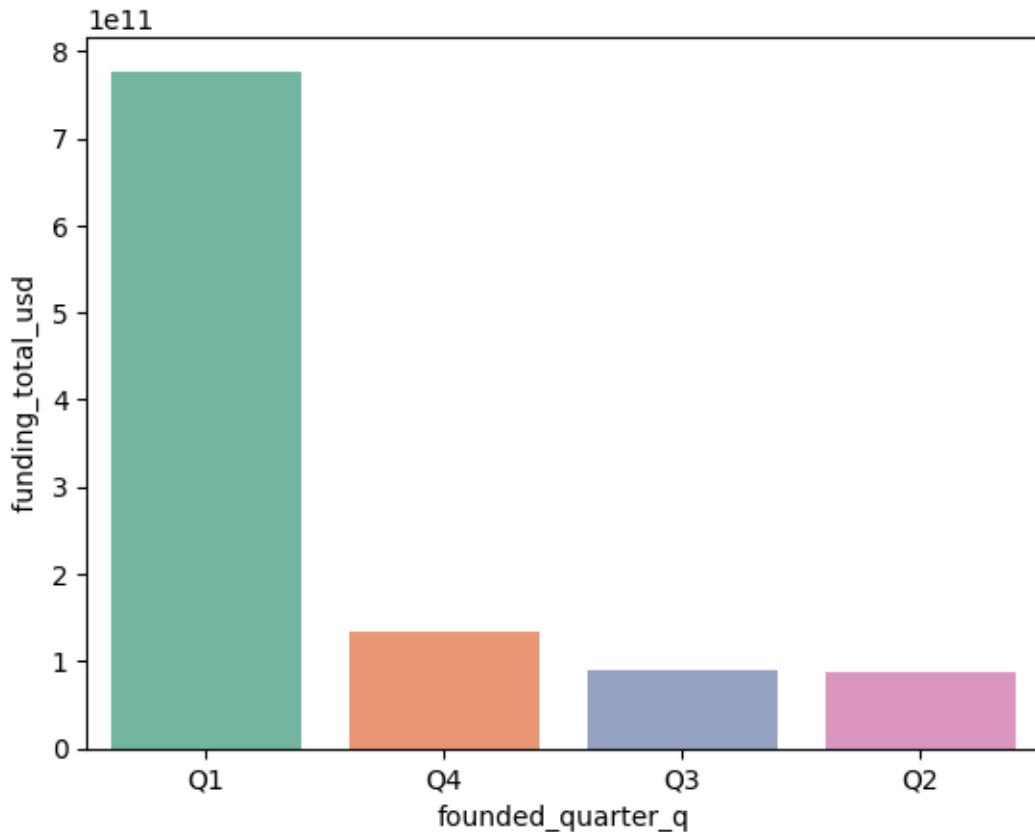
```
[ ]: <Axes: xlabel='founded_month_num', ylabel=' funding_total_usd '>
```



Insights: From the above plot it can be seen start ups founded in the January and October months have attracted the largest amount of average fundings

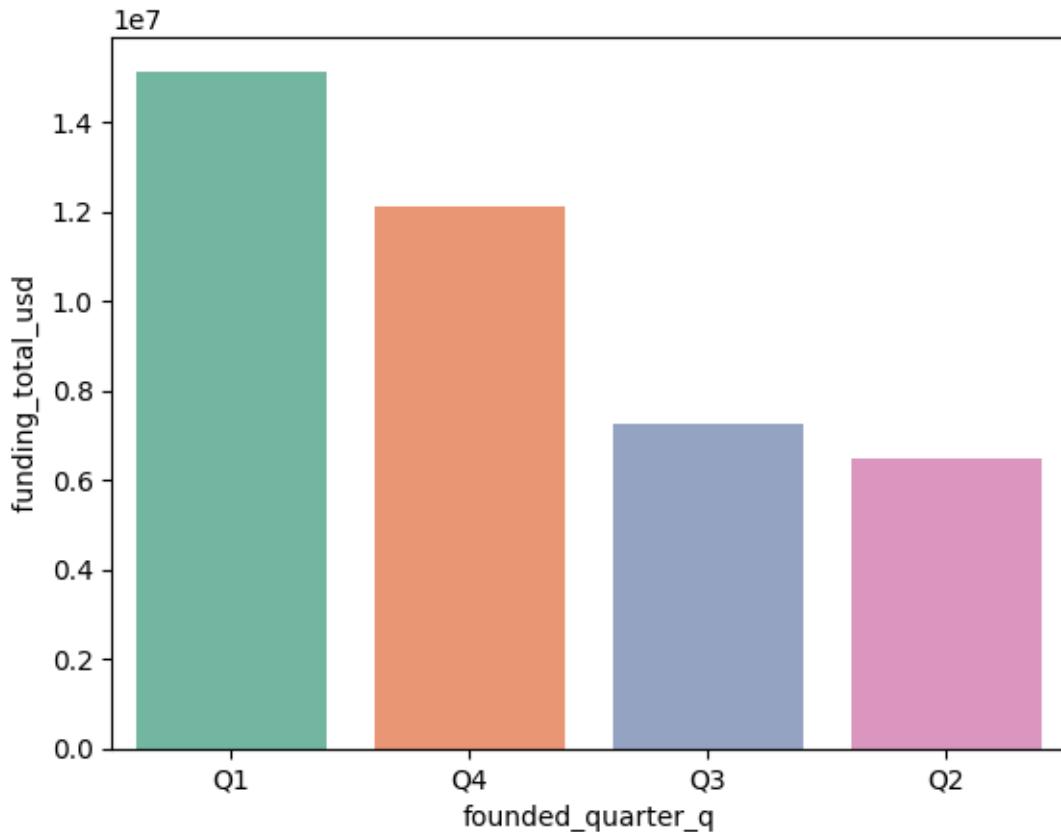
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({'funding_total_usd' :  
    ↪ 'sum'}).reset_index().sort_values('funding_total_usd', ascending=False)  
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']  
sns.barplot(y=df_plot['funding_total_usd'],  
    ↪ x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel=' funding_total_usd '>
```



```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({'funding_total_usd':  
    ↪'mean'}).reset_index().sort_values('funding_total_usd', ascending=False)  
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']  
sns.barplot(y=df_plot['funding_total_usd'],  
    ↪x=df_plot['founded_quarter_q'], palette='Set2')
```

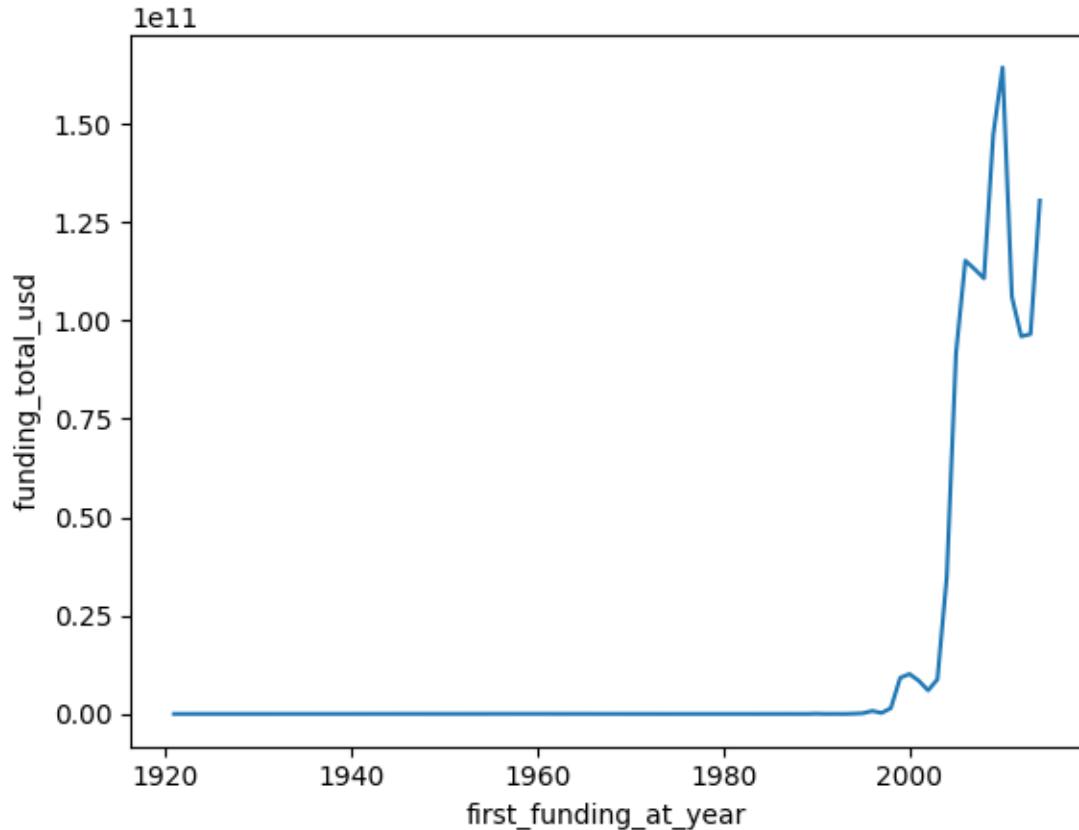
```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel=' funding_total_usd '>
```



Insights: From both plots it is evident that startups founded in the first quarter have attracted the most amount of fundings

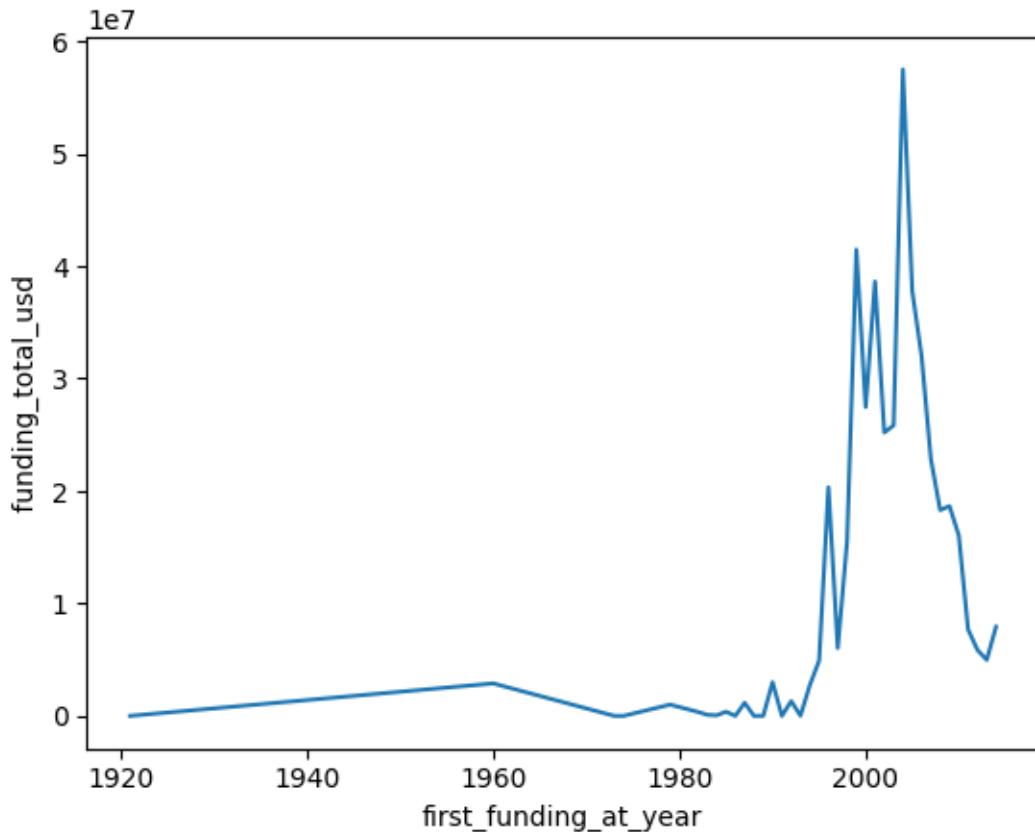
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({'funding_total_usd':
    ↴'sum'}).reset_index().sort_values('funding_total_usd', ascending=False)
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]
sns.lineplot(y=df_plot['funding_total_usd'], ↴
    ↴x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel=' funding_total_usd '>
```



```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({'funding_total_usd':  
    ↪'mean'}).reset_index().sort_values('funding_total_usd', ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot['funding_total_usd'],  
    ↪x=df_plot['first_funding_at_year'])
```

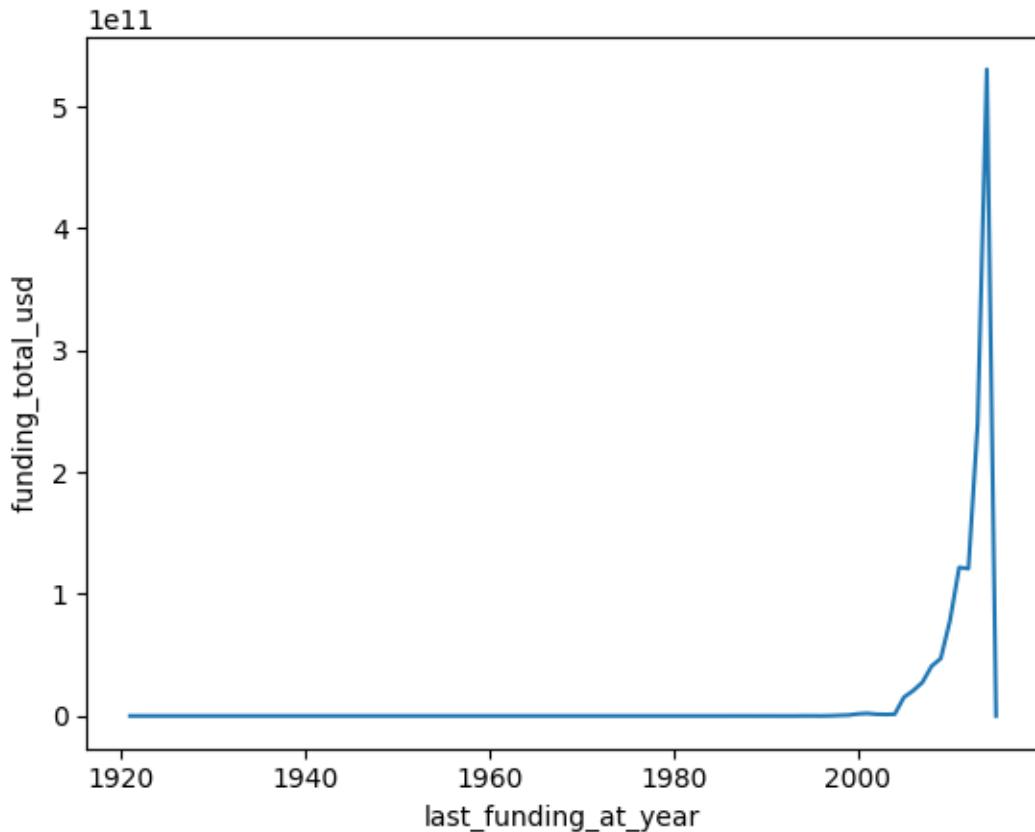
```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel=' funding_total_usd '>
```



Insights: It can be seen from both plots that a lot of start-ups received their first funding in the early 21st century indicating that 21st century being the age of start-ups

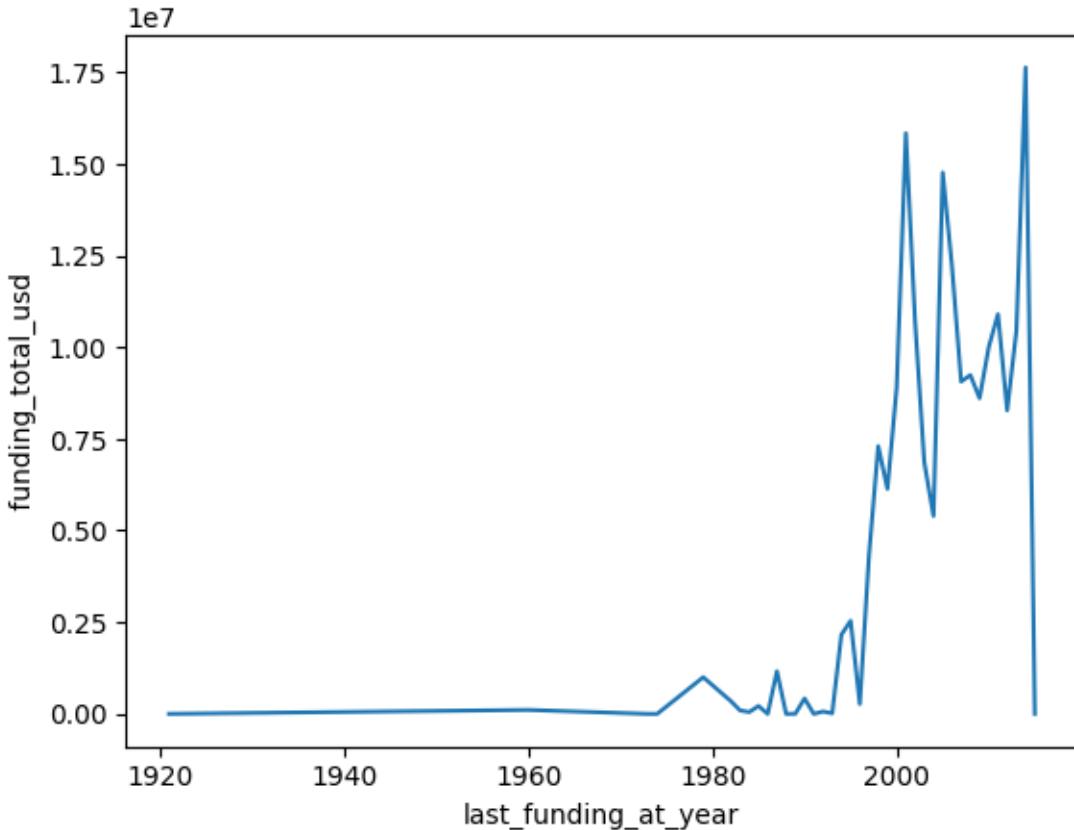
```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({'funding_total_usd':  
    ↪ 'sum'}).reset_index().sort_values('funding_total_usd', ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot['funding_total_usd'],  
    ↪ x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='funding_total_usd'>
```



```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({'funding_total_usd':  
    ↪'mean'}).reset_index().sort_values('funding_total_usd', ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot['funding_total_usd'],  
    ↪x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='funding_total_usd'>
```



Insights: It can be seen from both plots that a lot of startups received their last funding in the early 21st century indicating that the 21st century being the age of startups and a lot of startups were formed and closed down during this time.

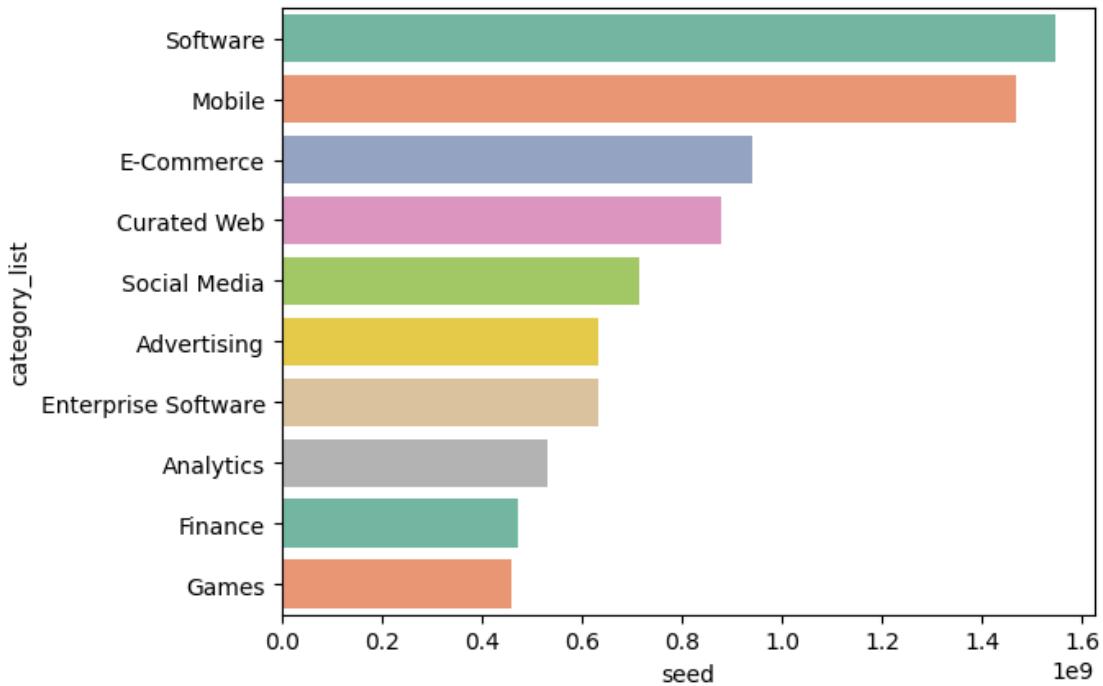
## 1.5 Seed Funding

1. Seed funding is a way for startups to raise early capital to support their development.
2. It's usually the first round of institutional funding a startup receives, after getting funding from friends, family, angel investors, or an incubator.

Average and Total Analysis of the Seed Funds as shown below.

```
[ ]: df_plot = df_clean.groupby('category_list').agg({'seed':'sum'}).reset_index()
      .sort_values('seed', ascending=False).head(10)
sns.barplot(x=df_plot['seed'], y=df_plot['category_list'], palette='Set2')

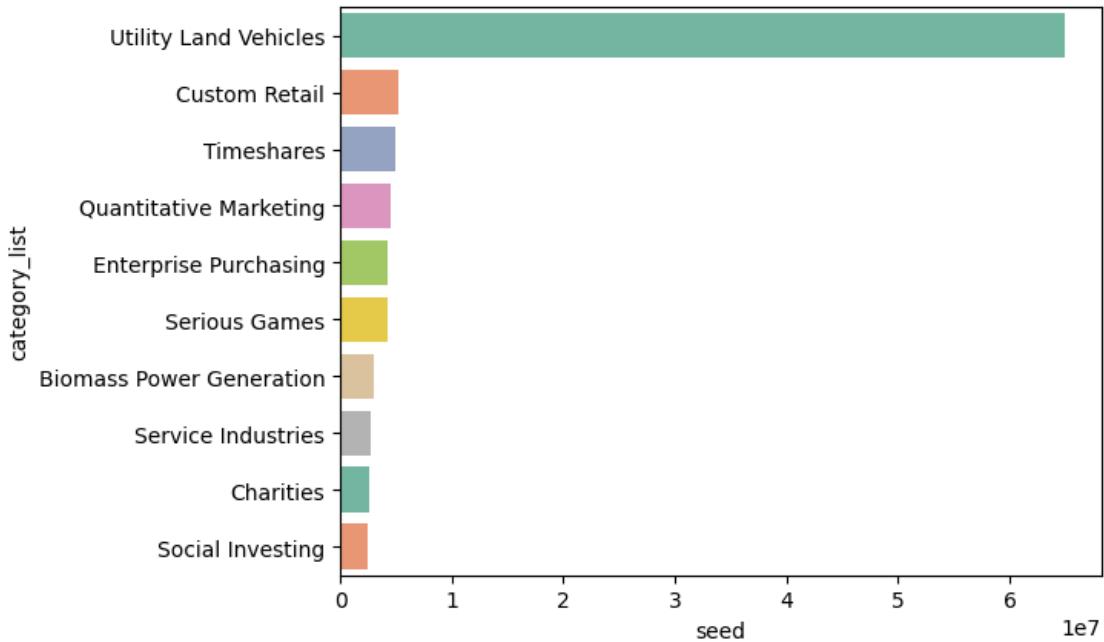
[ ]: <Axes: xlabel='seed', ylabel='category_list'>
```



Insights: From the plot of top 10 categories Software have the largest number of total seed fundings.

```
[ ]: df_plot = df_clean.groupby('category_list').agg({'seed':'mean'}).reset_index()
      .sort_values('seed', ascending=False).head(10)
sns.barplot(x=df_plot['seed'], y=df_plot['category_list'], palette='Set2')
```

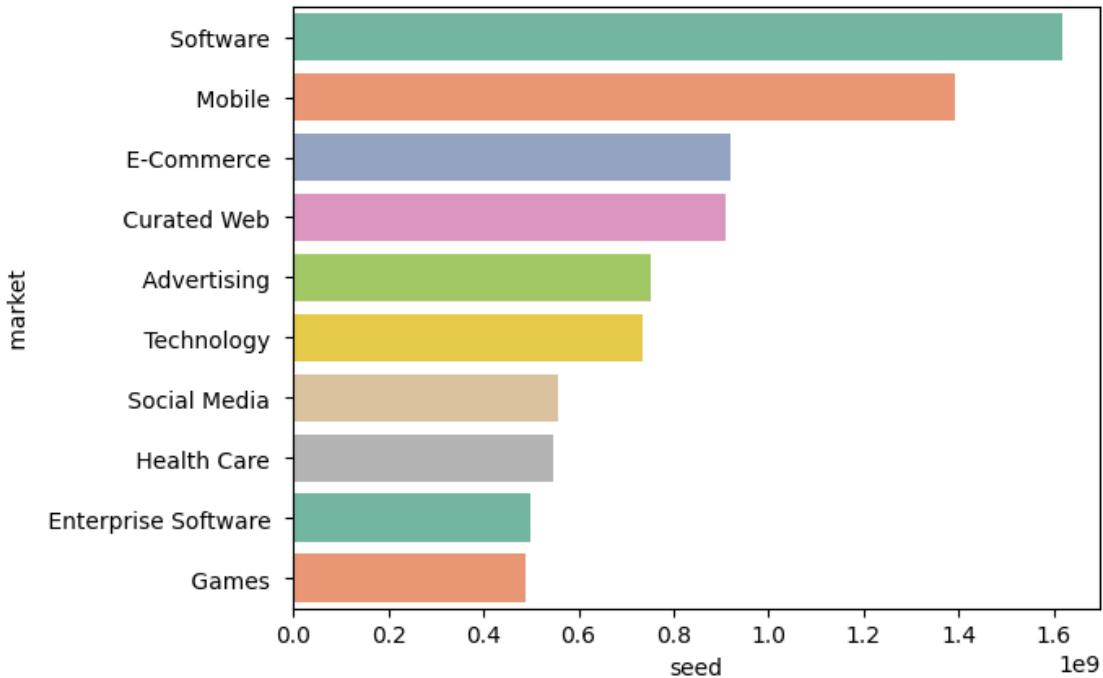
```
[ ]: <Axes: xlabel='seed', ylabel='category_list'>
```



Insights: From the plot of top 10 categories Utility Land Vehicles have the largest number of average seed fundings.

```
[ ]: df_plot = df_clean.groupby(' market ').agg({'seed':'sum'}).reset_index().
    sort_values('seed', ascending=False).head(10)
sns.barplot(x=df_plot['seed'], y=df_plot[' market '], palette='Set2')
```

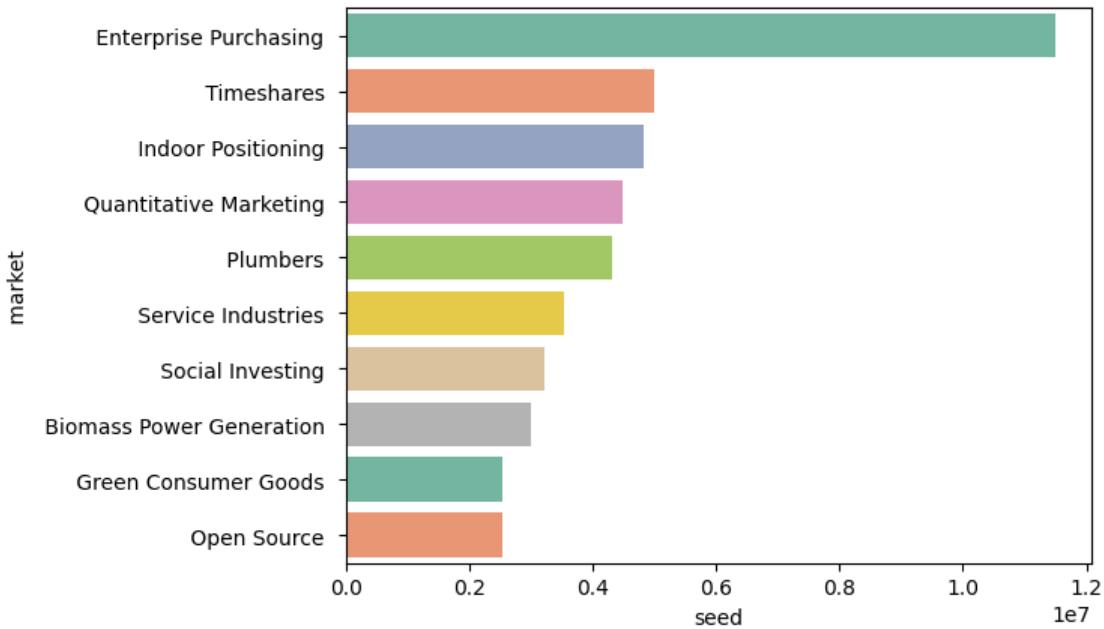
```
[ ]: <Axes: xlabel='seed', ylabel=' market '>
```



Insights: From the plot of top 10 markets Software have the largest number of total seed fundings.

```
[ ]: df_plot = df_clean.groupby(' market ').agg({'seed':'mean'}).reset_index()
      .sort_values('seed',ascending=False).head(10)
sns.barplot(x=df_plot['seed'], y=df_plot[' market '], palette='Set2')
```

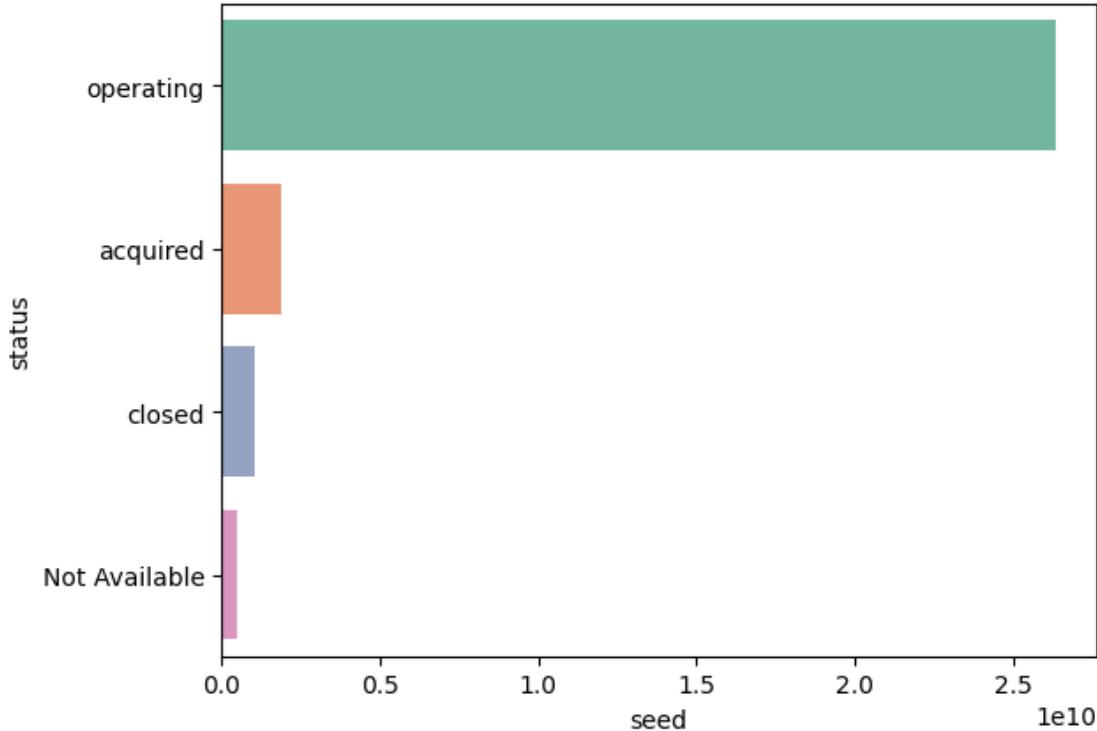
```
[ ]: <Axes: xlabel='seed', ylabel=' market '>
```



Insights: From the plot of top 10 markets Enterprise Purchasing have the largest number of avergae seed fundings.

```
[ ]: df_plot = df_clean.groupby('status').agg({'seed':'sum'}).reset_index().
    ↪sort_values('seed', ascending=False).head(10)
sns.barplot(x=df_plot['seed'], y=df_plot['status'], palette='Set2')
```

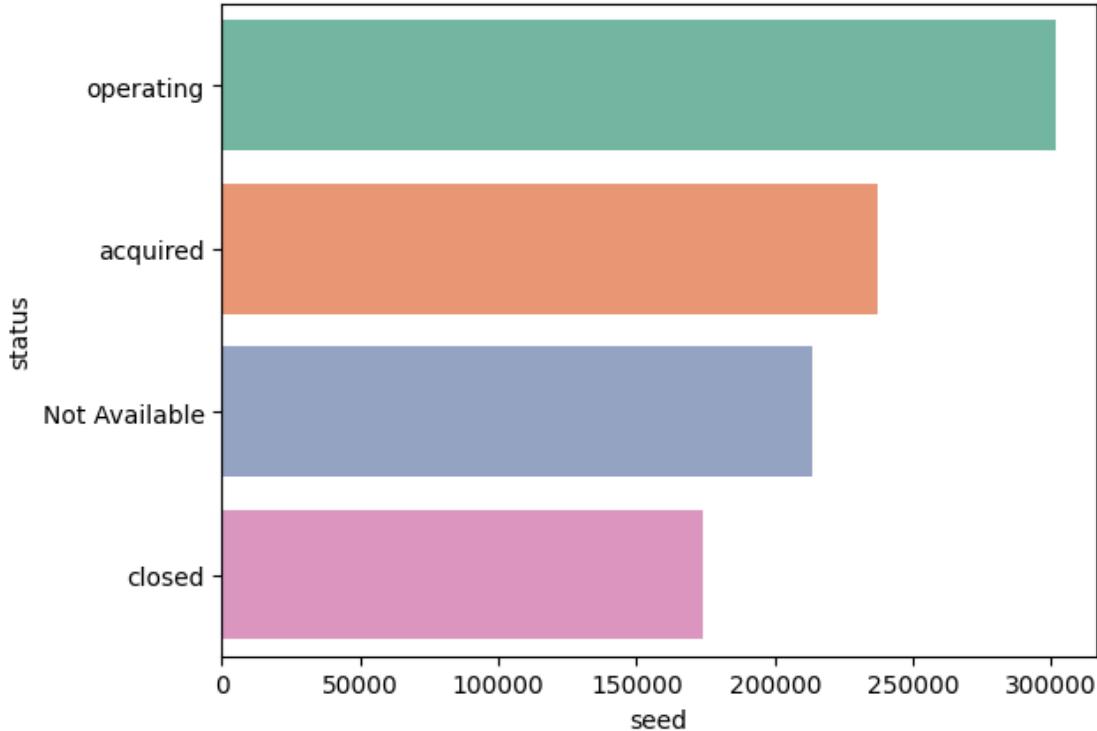
```
[ ]: <Axes: xlabel='seed', ylabel='status'>
```



Insights: Startups that have an operating status have the largest amount of total seed fundings.

```
[ ]: df_plot = df_clean.groupby('status').agg({'seed':'mean'}).reset_index()
      ↪sort_values('seed', ascending=False).head(10)
sns.barplot(x=df_plot['seed'], y=df_plot['status'], palette='Set2')
```

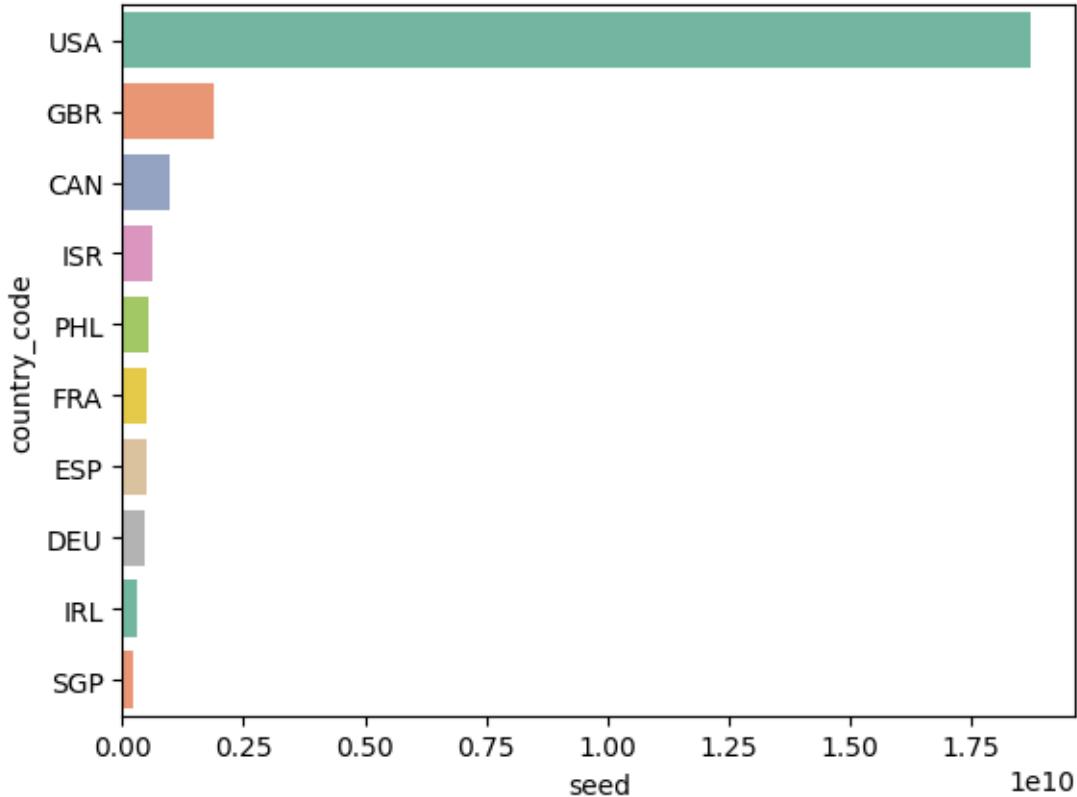
```
[ ]: <Axes: xlabel='seed', ylabel='status'>
```



Insights: Startups that have an operating status have the largest amount of average seed fundings.

```
[ ]: df_plot = df_clean.groupby('country_code').agg({'seed':'sum'}).reset_index()
      .sort_values('seed', ascending=False).head(11)
df_plot = df_plot[df_plot['country_code']!='Not Available']
sns.barplot(x=df_plot['seed'], y=df_plot['country_code'], palette='Set2')

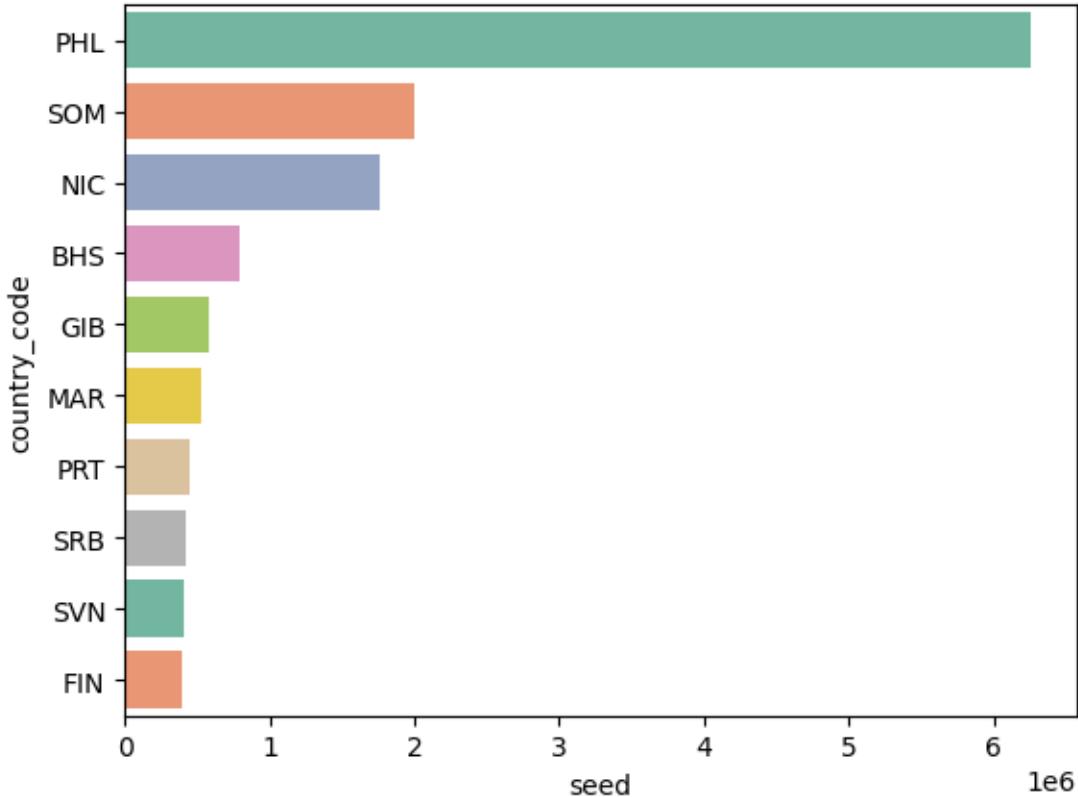
[ ]: <Axes: xlabel='seed', ylabel='country_code'>
```



Insights: From the plot of top 10 countries USA have the largest number of total seed fundings.

```
[ ]: df_plot = df_clean.groupby('country_code').agg({'seed':'mean'}).reset_index()
    .sort_values('seed', ascending=False).head(10)
df_plot = df_plot[df_plot['country_code']!='Not Available']
sns.barplot(x=df_plot['seed'], y=df_plot['country_code'], palette='Set2')
```

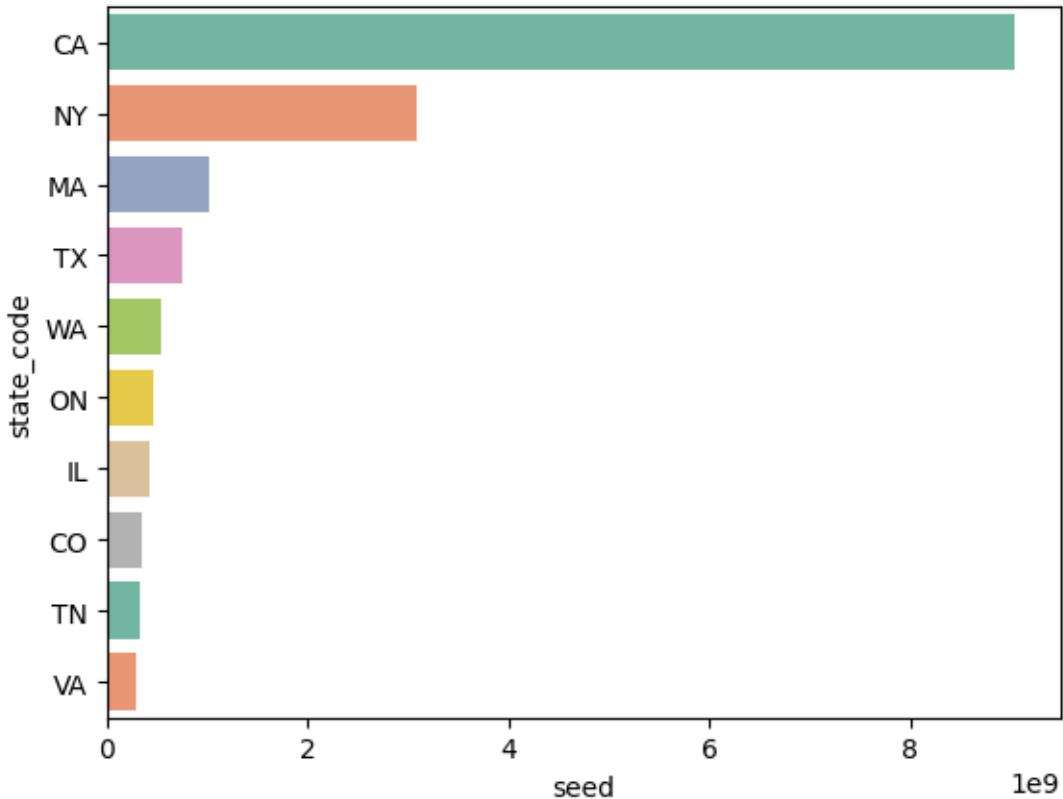
```
[ ]: <Axes: xlabel='seed', ylabel='country_code'>
```



Insights: From the plot of top 10 countries Philippines have the largest number of average seed fundings.

```
[ ]: df_plot = df_clean.groupby('state_code').agg({'seed':'sum'}).reset_index()
      .sort_values('seed', ascending=False).head(11)
df_plot = df_plot[df_plot['state_code']!='Not Available']
sns.barplot(x=df_plot['seed'], y=df_plot['state_code'], palette='Set2')
```

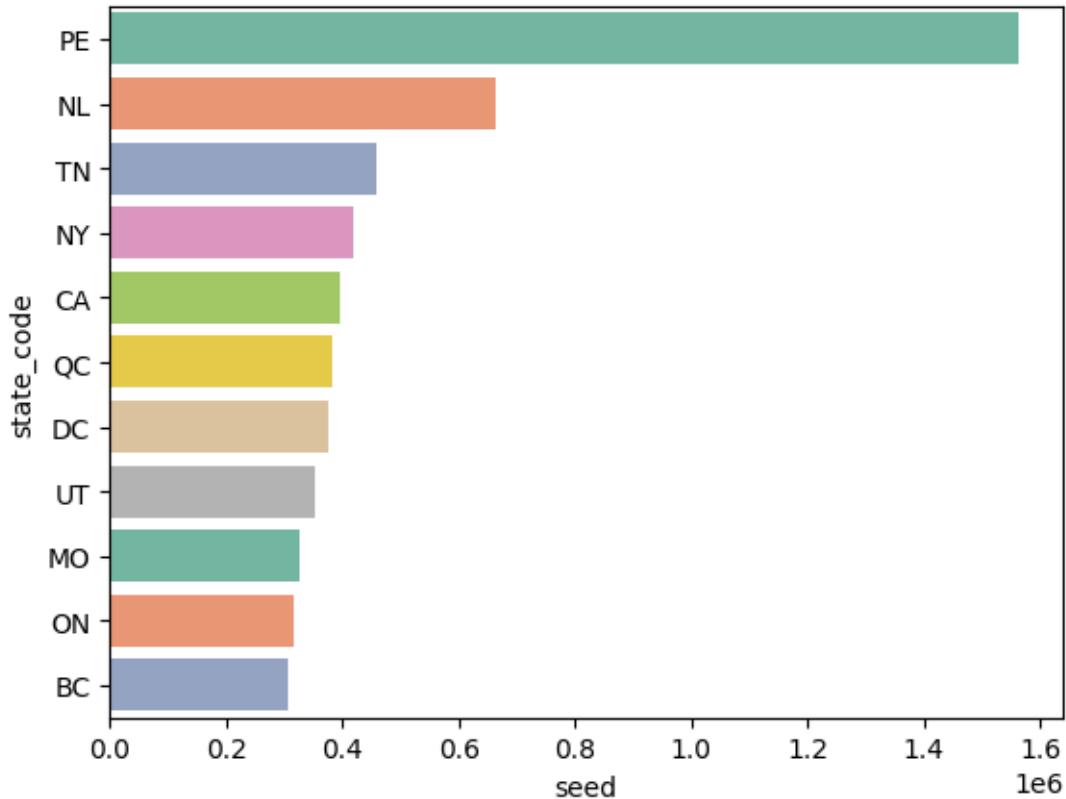
```
[ ]: <Axes: xlabel='seed', ylabel='state_code'>
```



Insights: From the plot of top 10 states California have the largest number of total seed fundings.

```
[ ]: df_plot = df_clean.groupby('state_code').agg({'seed':'mean'}).reset_index() .
    ↪sort_values('seed', ascending=False).head(11)
df_plot = df_plot[df_plot['state_code']!='Not Available']
sns.barplot(x=df_plot['seed'], y=df_plot['state_code'], palette='Set2')
```

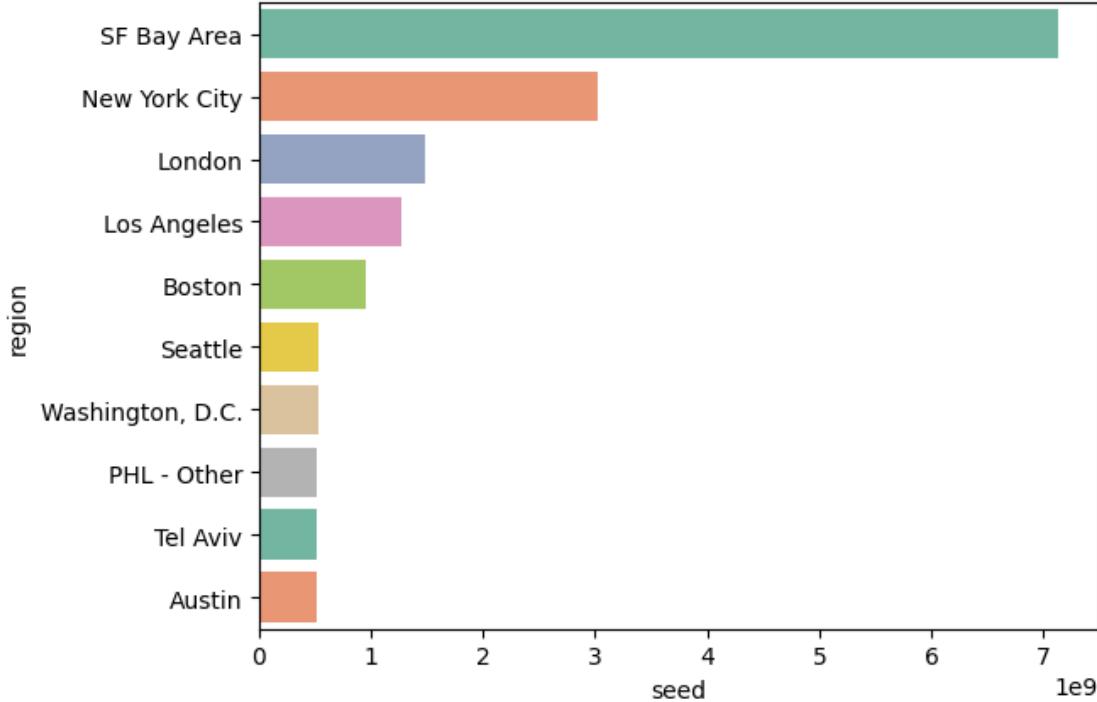
```
[ ]: <Axes: xlabel='seed', ylabel='state_code'>
```



Insights: From the plot of top 10 states Prince Edward Island have the largest number of avergae seed fundings.

```
[ ]: df_plot = df_clean.groupby('region').agg({'seed':'sum'}).reset_index().
    ↪sort_values('seed', ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot['seed'], y=df_plot['region'], palette='Set2')
```

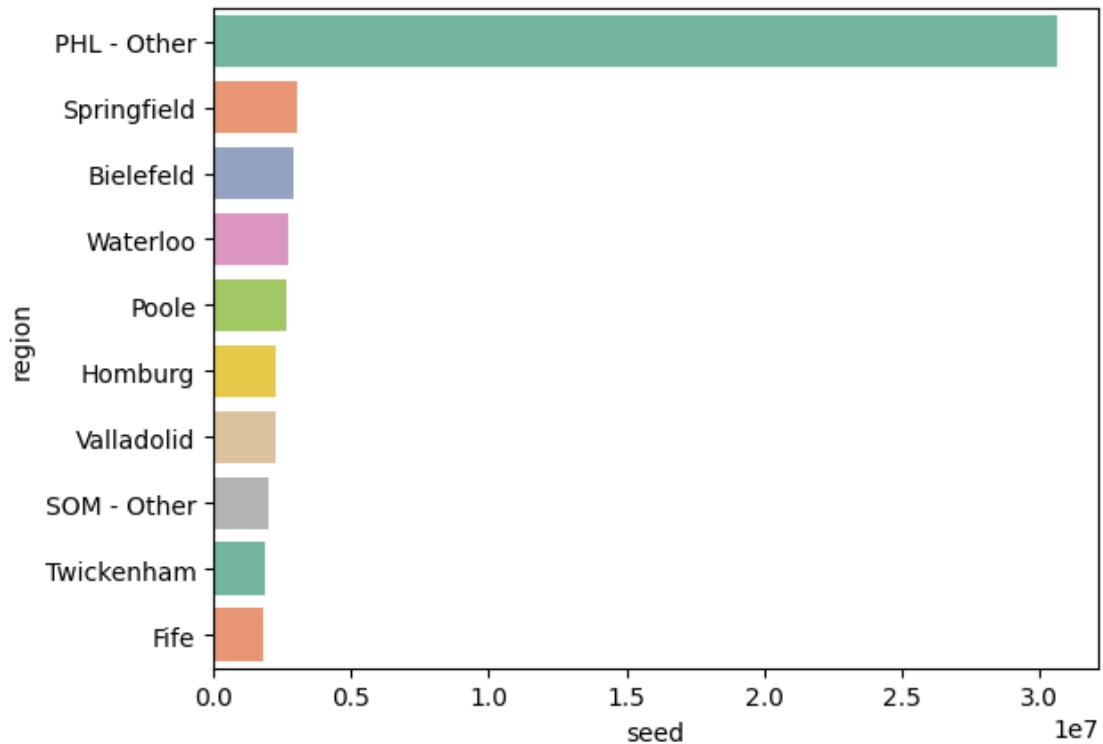
```
[ ]: <Axes: xlabel='seed', ylabel='region'>
```



Insights: From the plot of top 10 cities SF Bay Area have the largest number of total seed fundings.

```
[ ]: df_plot = df_clean.groupby('region').agg({'seed':'mean'}).reset_index()
      .sort_values('seed', ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot['seed'], y=df_plot['region'], palette='Set2')

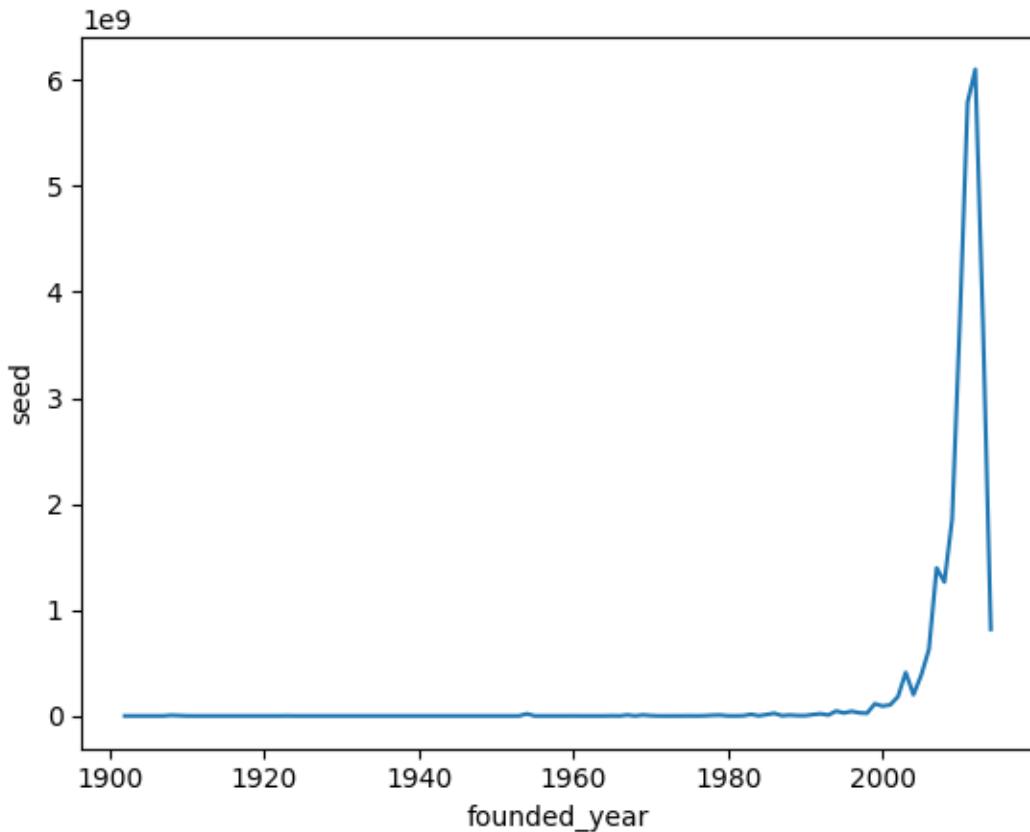
[ ]: <Axes: xlabel='seed', ylabel='region'>
```



Insights: From the plot of top 10 cities PHL-Other have the largest number of avergae seed fundings.

```
[ ]: df_plot = df_clean.groupby('founded_year').agg({'seed':'sum'}).reset_index().
    ↪sort_values('seed', ascending=False)
df_plot = df_plot[df_plot['founded_year'] > 1000]
sns.lineplot(y=df_plot['seed'], x=df_plot['founded_year'])
```

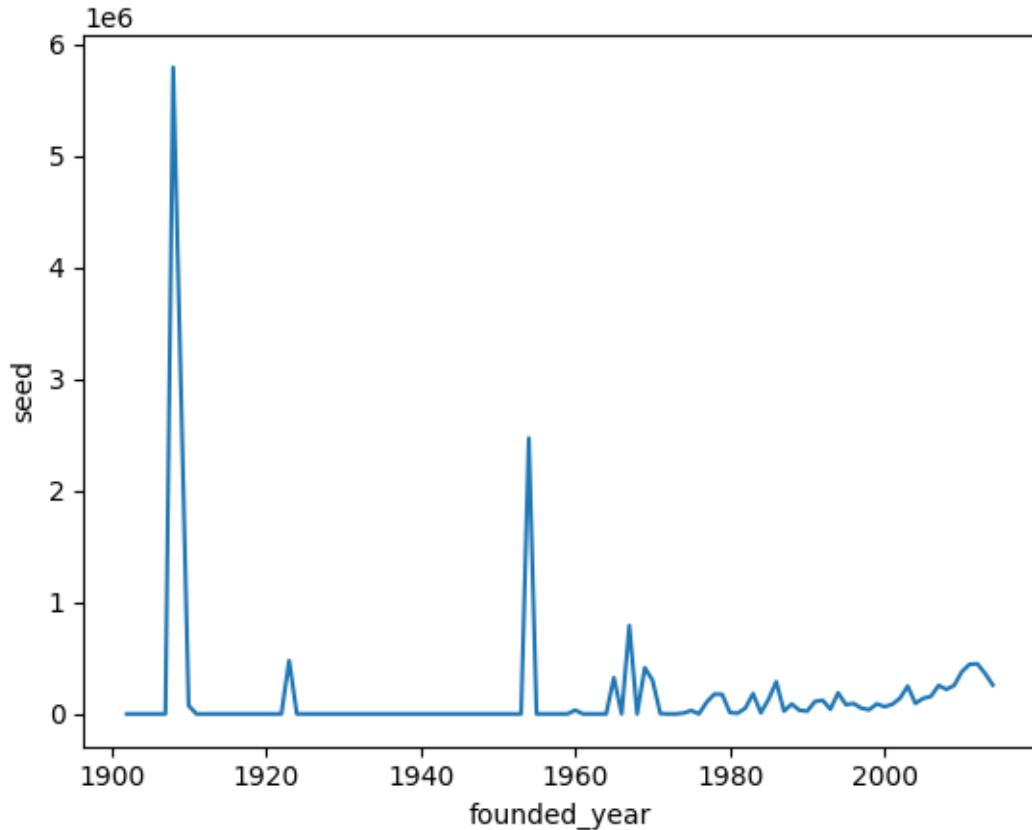
```
[ ]: <Axes: xlabel='founded_year', ylabel='seed'>
```



Insights: From the above trend it can be seen that startups found in the 21st century received the largest amount of seed fundings.

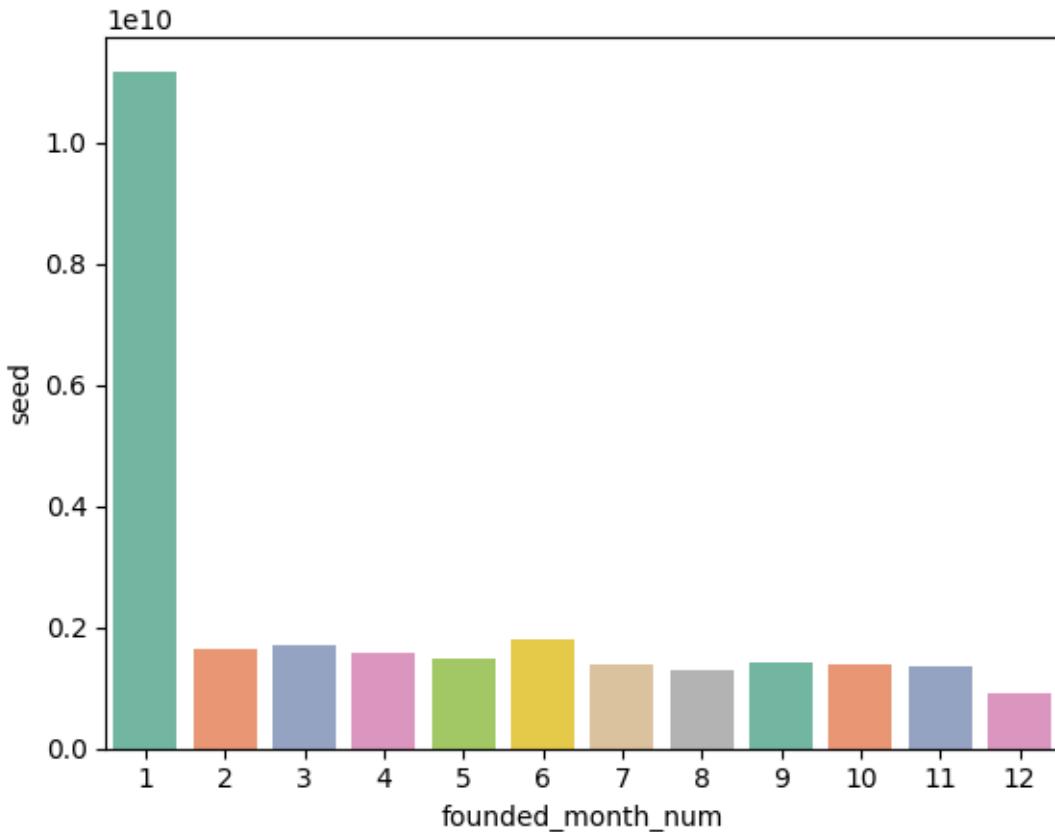
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({'seed':'mean'}).reset_index().  
      ↪sort_values('seed', ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot['seed'], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='seed'>
```



Insights: The average plot indicates that large number of startups were found in the 21st century while over the years from 1900 quite a lot of startups have attracted good amount of seed fundings where the year 1910 has seen the highest spike

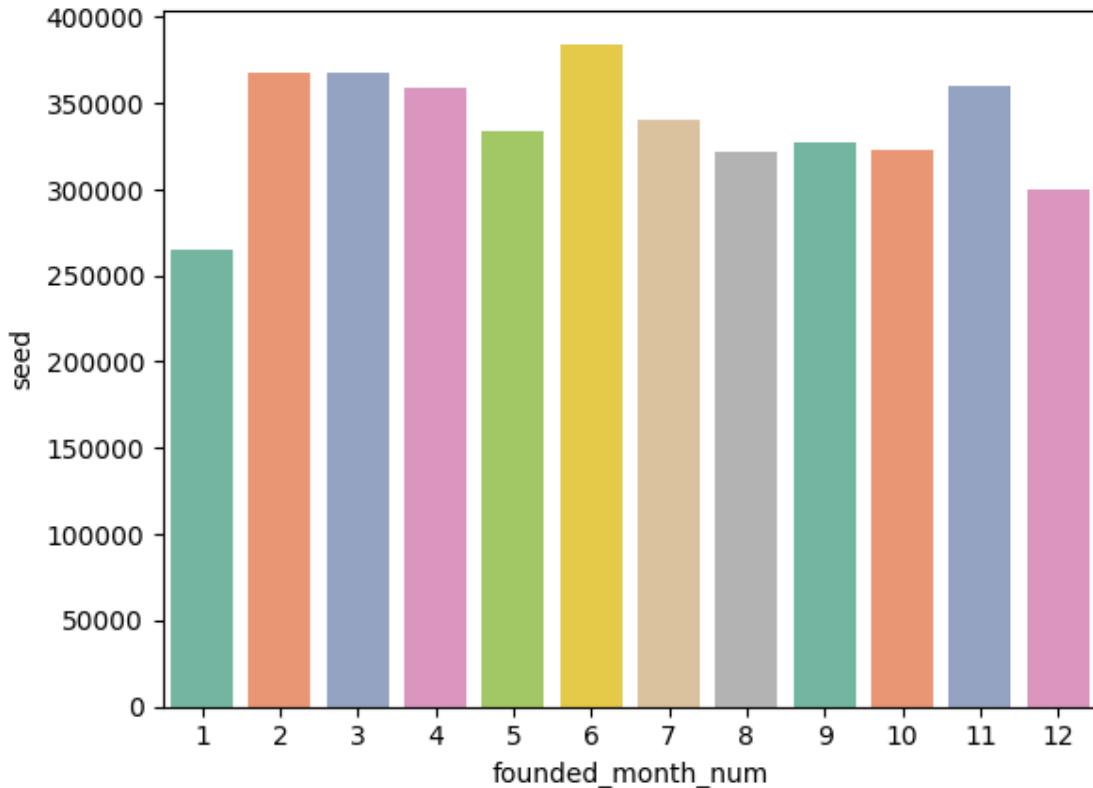
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({'seed':'sum'})  
    .reset_index().sort_values('seed', ascending=False)  
df_plot = df_plot[df_plot['founded_month_num'] > 0]  
sns.barplot(y=df_plot['seed'], x=df_plot['founded_month_num'], palette='Set2')  
  
[ ]: <Axes: xlabel='founded_month_num', ylabel='seed'>
```



Insights: From the above plot it can be seen that start ups founded in the month of January have attracted the most amount of seed fundings

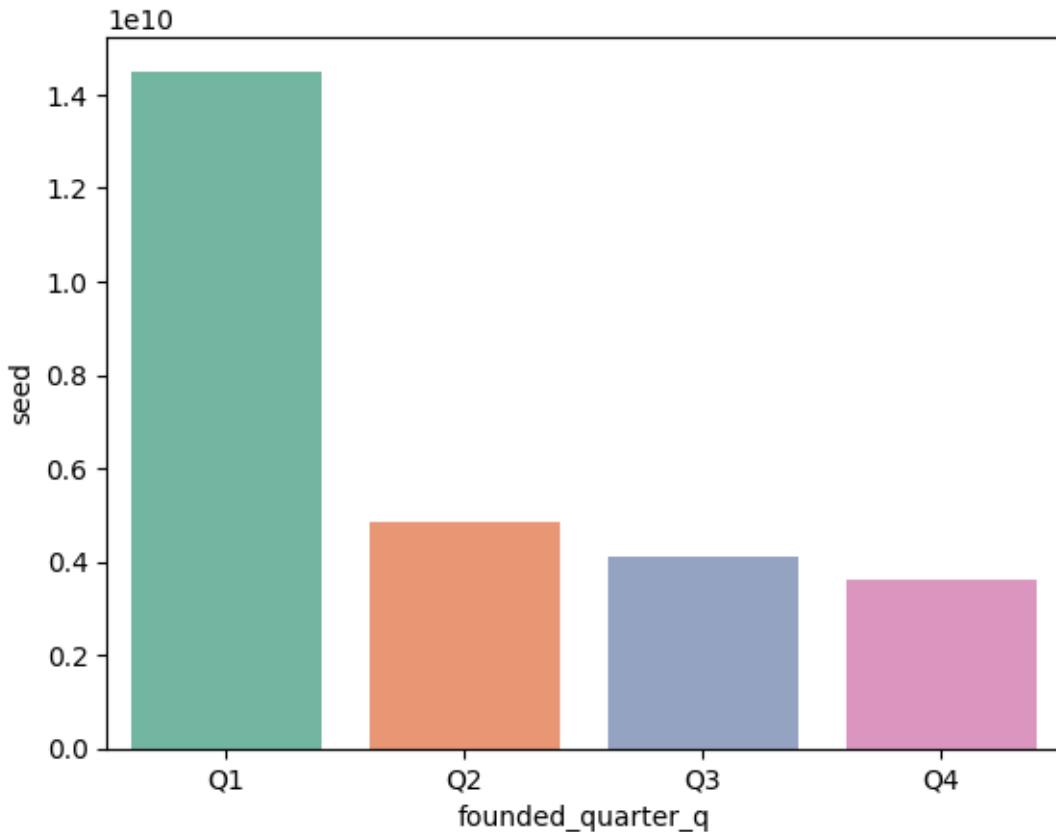
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({'seed':'mean'}).
      ↪reset_index().sort_values('seed', ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot['seed'], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='seed'>
```



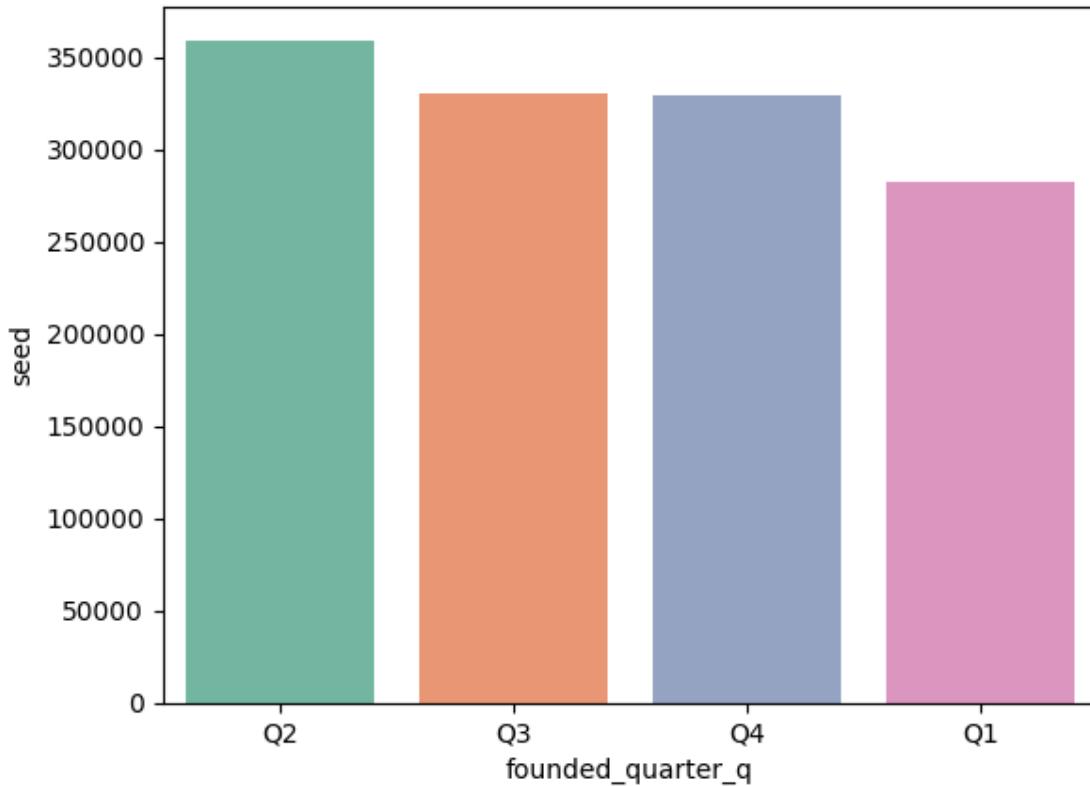
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({'seed':'sum'}).
    ↪reset_index().sort_values('seed', ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q']!='Q0']
sns.barplot(y=df_plot['seed'], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='seed'>
```



```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({'seed':'mean'})  
    .reset_index().sort_values('seed', ascending=False)  
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']  
sns.barplot(y=df_plot['seed'], x=df_plot['founded_quarter_q'], palette='Set2')
```

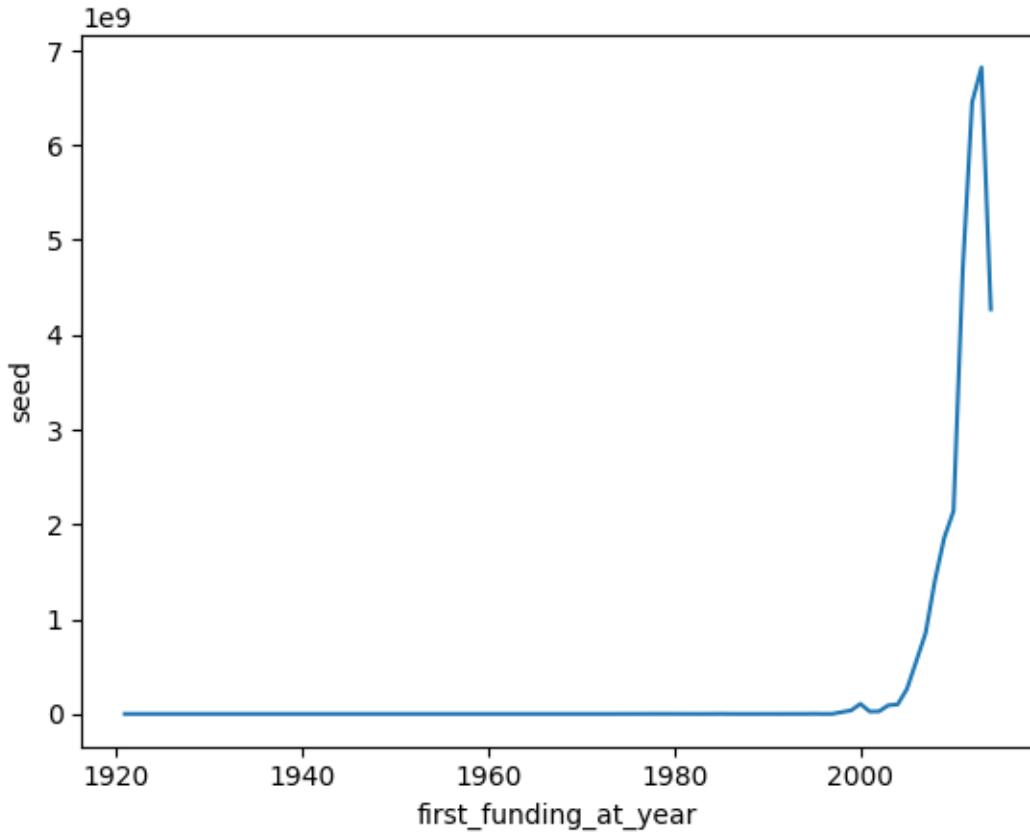
```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='seed'>
```



Insights: From both plots it is evident that startups founded in the first quarter have attracted the most amount of seed fundings

```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({'seed':'sum'}).
      ↪reset_index().sort_values('seed',ascending=False)
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]
sns.lineplot(y=df_plot['seed'], x=df_plot['first_funding_at_year'])
```

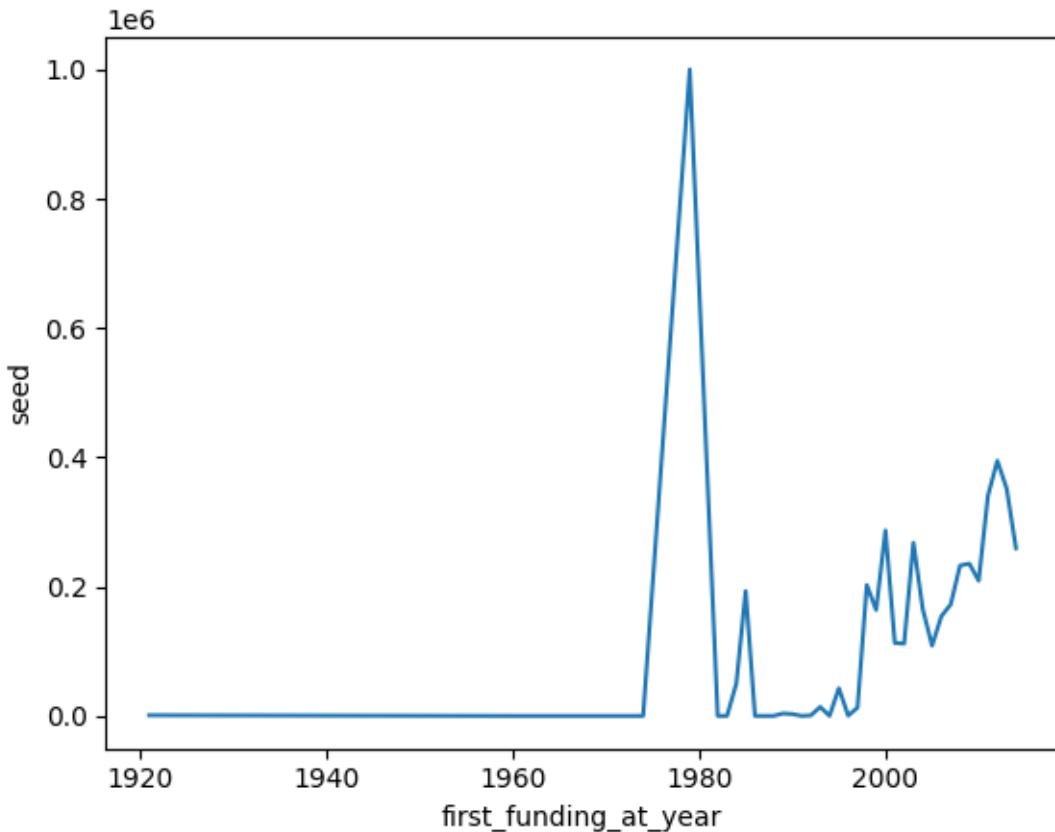
```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='seed'>
```



Insights: It can be seen from the plot that a lot of start-ups that received their first fundings in the early 21st century attracted large amounts of seed fundings

```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({'seed':'mean'}).
      ↪reset_index().sort_values('seed', ascending=False)
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]
sns.lineplot(y=df_plot['seed'], x=df_plot['first_funding_at_year'])
```

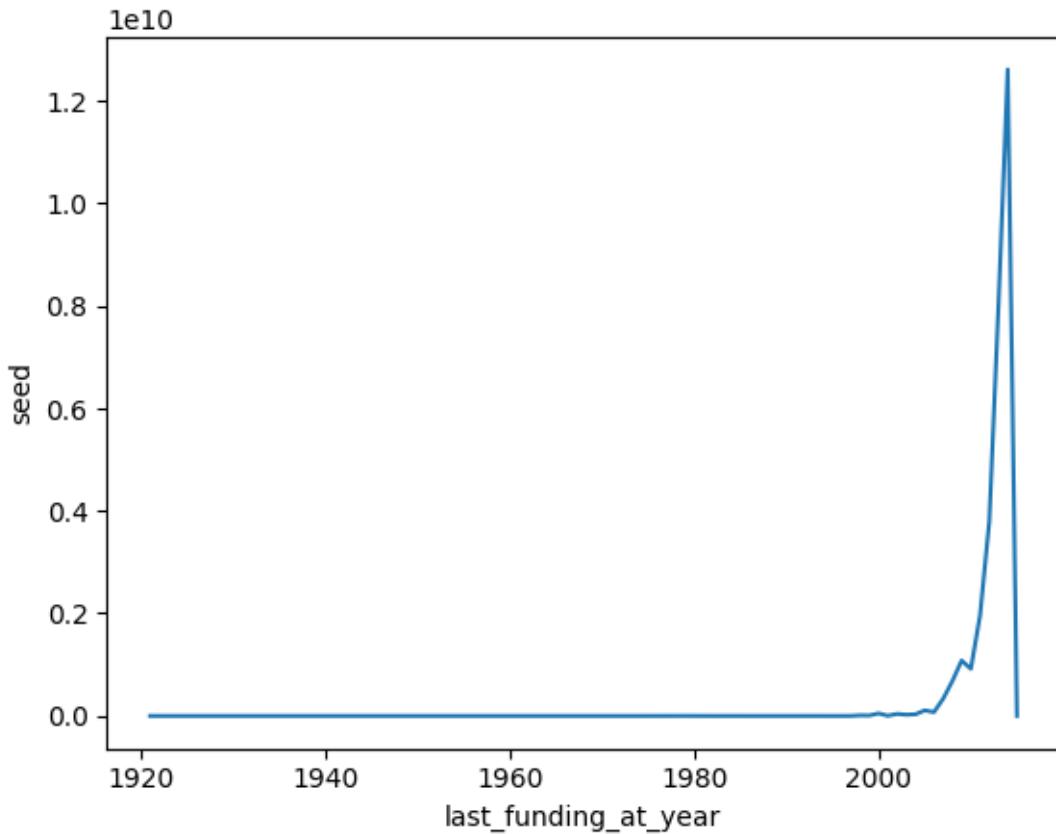
```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='seed'>
```



Insights: It can be seen from the plots that a lot of start-ups received their first funding in the early 21st century, attracted a large amount of seed funding, and a spike in 1980 indicating a large seed funding during that year.

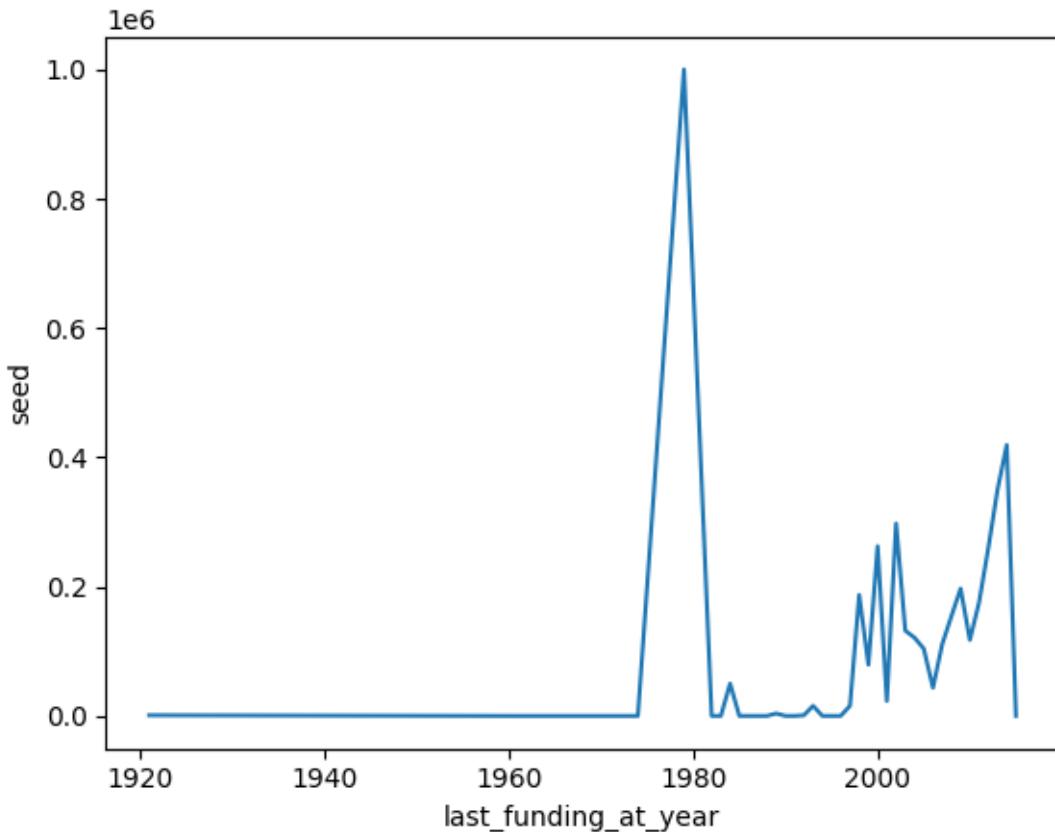
```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({'seed':'sum'}).
    .reset_index().sort_values('seed', ascending=False)
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]
sns.lineplot(y=df_plot['seed'], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='seed'>
```



```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({'seed':'mean'})  
    .reset_index().sort_values('seed', ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot['seed'], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='seed'>
```



Insights: It can be seen from the plots that a lot of startups that received their last funding in the early 21st century attracted a large amount of seed funding and a spike in 1980 indicating a large seed funding during that year.

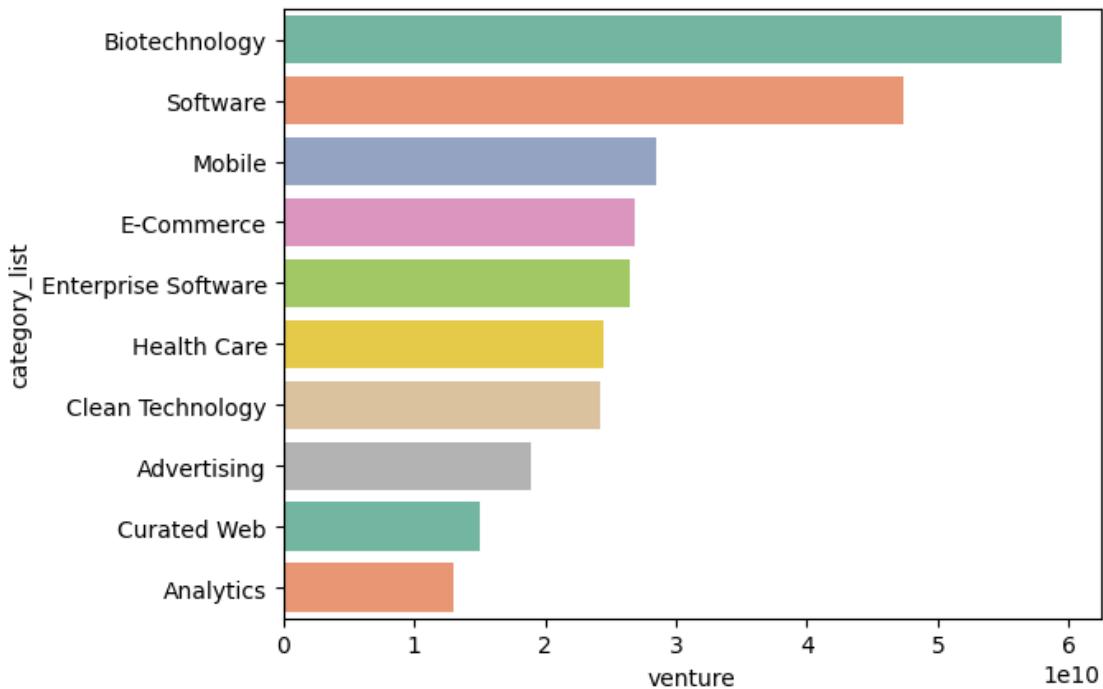
## 1.6 Venture Funding

Venture funding, also known as venture capital (VC), is a type of investment that provides capital to startups and small- to medium-sized businesses in exchange for an ownership stake in the company.

Average and Total Analysis of the Venture Funds as shown below.

```
[ ]: df_plot = df_clean.groupby('category_list').agg({'venture':'sum'}).
    reset_index().sort_values('venture', ascending=False).head(10)
sns.barplot(x=df_plot['venture'], y=df_plot['category_list'], palette='Set2')
```

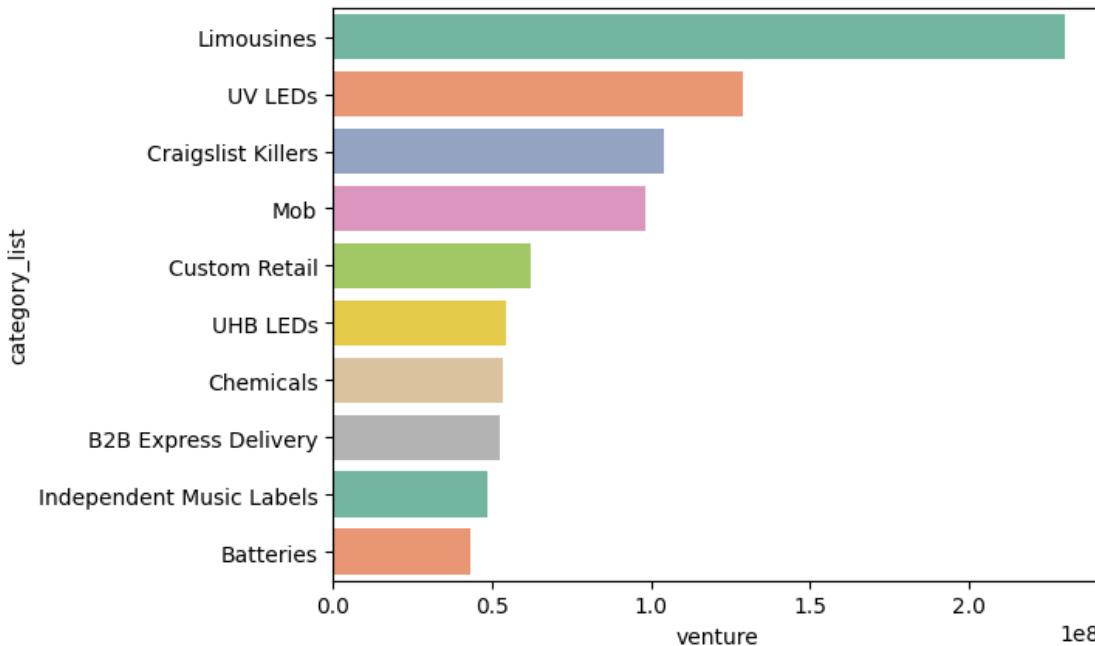
```
[ ]: <Axes: xlabel='venture', ylabel='category_list'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of total venture fundings.

```
[ ]: df_plot = df_clean.groupby('category_list').agg({'venture':'mean'}).
    ↪reset_index().sort_values('venture',ascending=False).head(10)
sns.barplot(x=df_plot['venture'], y=df_plot['category_list'], palette='Set2')
```

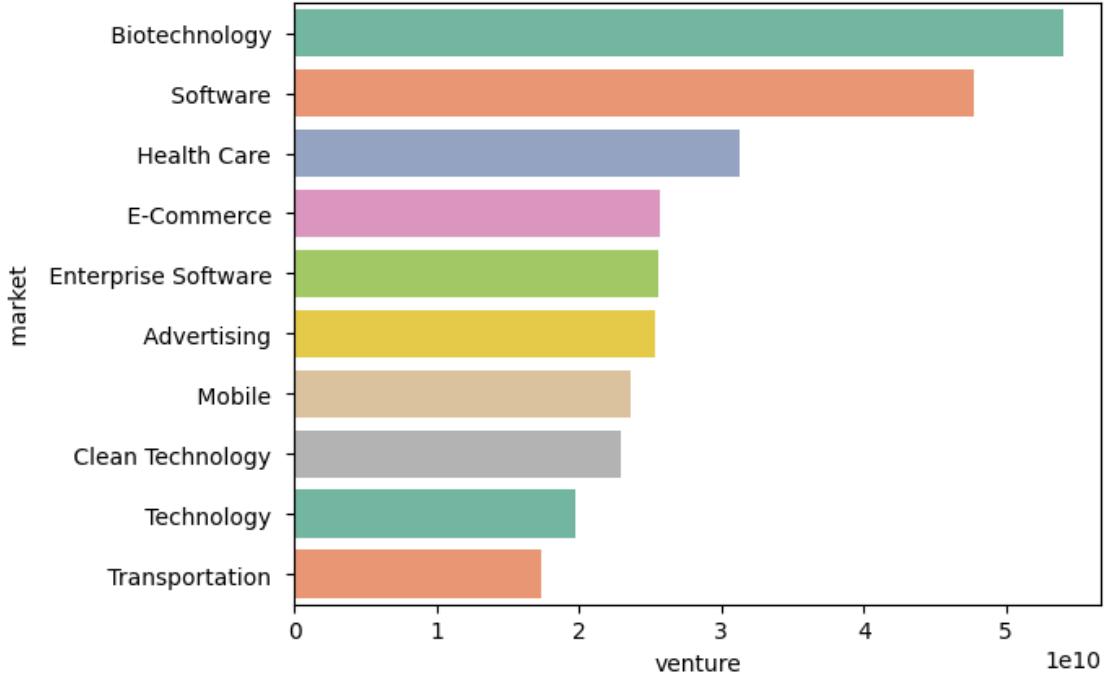
```
[ ]: <Axes: xlabel='venture', ylabel='category_list'>
```



Insights: From the plot of top 10 categories Limousines have the largest number of average venturefundings.

```
[ ]: df_plot = df_clean.groupby(' market ').agg({'venture':'sum'}).reset_index()
    .sort_values('venture', ascending=False).head(10)
sns.barplot(x=df_plot['venture'], y=df_plot[' market '], palette='Set2')
```

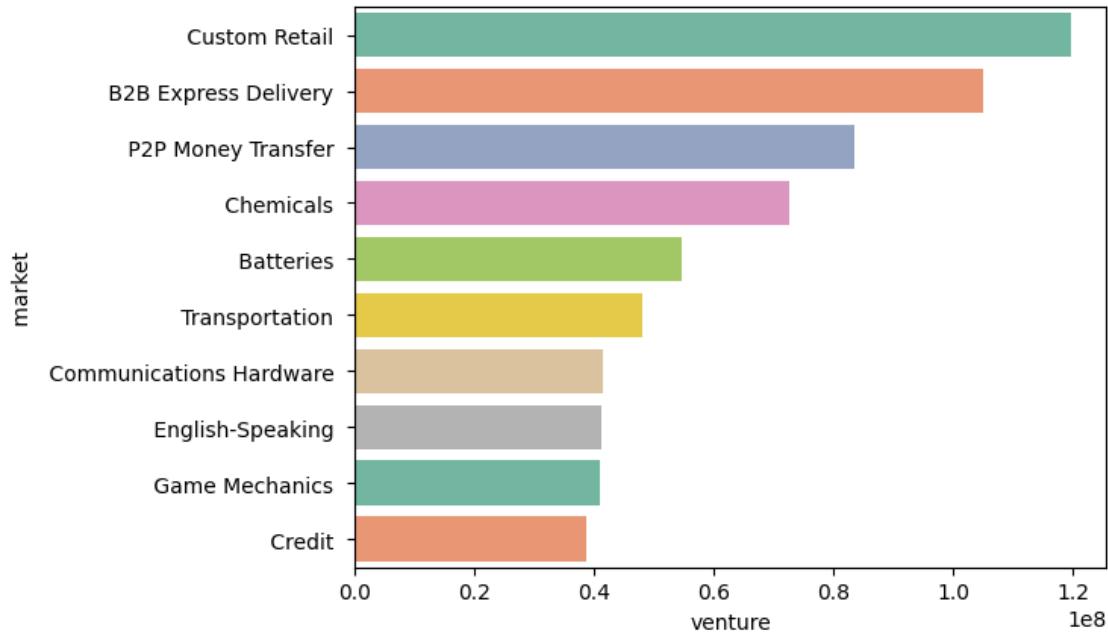
```
[ ]: <Axes: xlabel='venture', ylabel=' market '>
```



Insights: From the plot of top 10 markets Biotechnology have the largest number of total venture fundings.

```
[ ]: df_plot = df_clean.groupby(' market ').agg({'venture':'mean'}).reset_index().
    ↪sort_values('venture', ascending=False).head(10)
sns.barplot(x=df_plot['venture'], y=df_plot[' market '], palette='Set2')
```

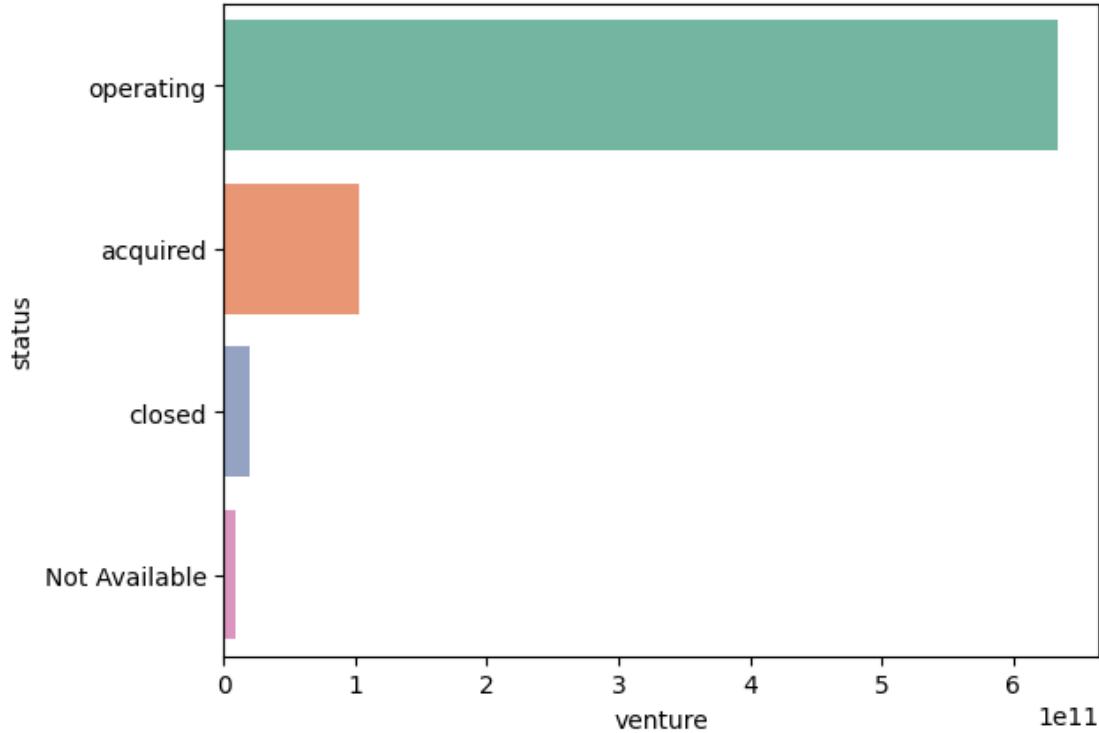
```
[ ]: <Axes: xlabel='venture', ylabel=' market '>
```



Insights: From the plot of top 10 markets Custom Retail have the largest number of avergae venture fundings.

```
[ ]: df_plot = df_clean.groupby('status').agg({'venture':'sum'}).reset_index()
     .sort_values('venture', ascending=False).head(10)
sns.barplot(x=df_plot['venture'], y=df_plot['status'], palette='Set2')
```

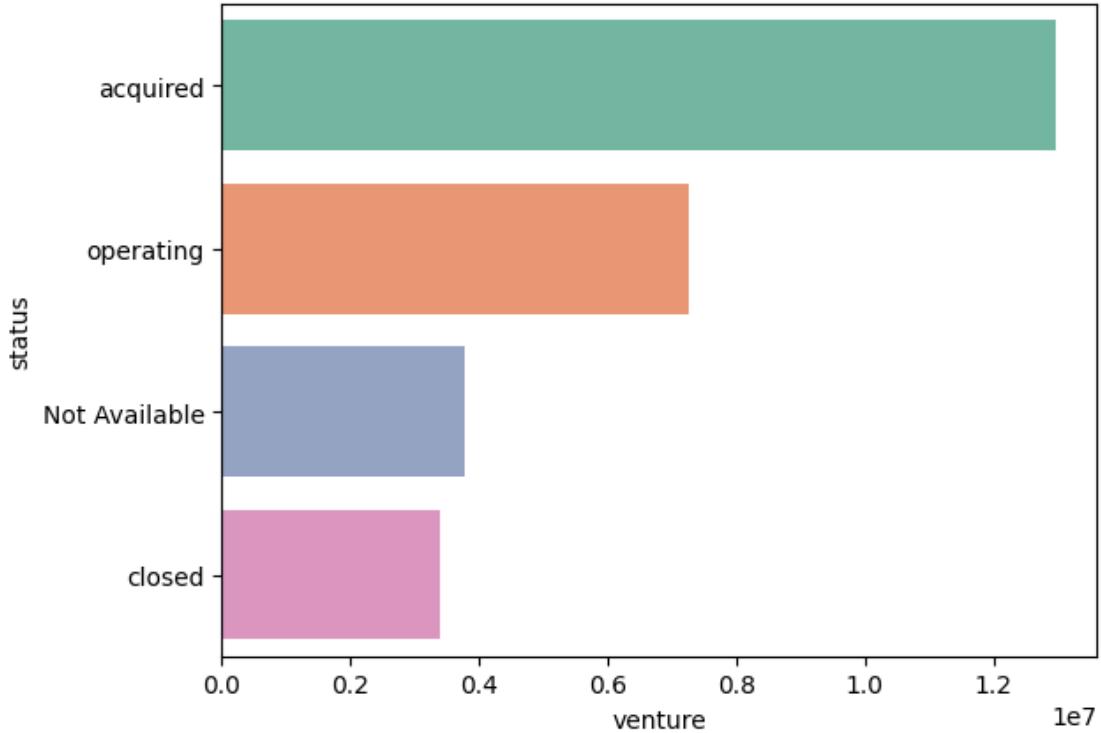
```
[ ]: <Axes: xlabel='venture', ylabel='status'>
```



Insights: Startups that have an operating status have the largest amount of total venture fundings.

```
[ ]: df_plot = df_clean.groupby('status').agg({'venture':'mean'}).reset_index().  
     .sort_values('venture', ascending=False).head(10)  
sns.barplot(x=df_plot['venture'], y=df_plot['status'], palette='Set2')
```

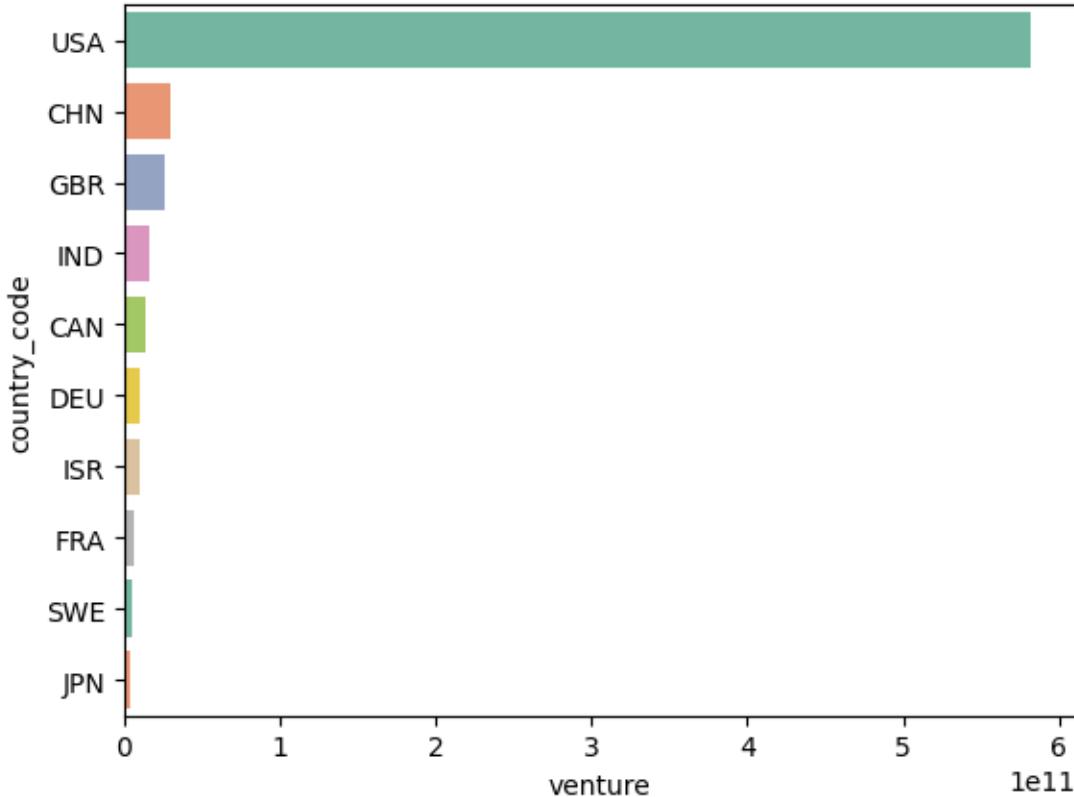
```
[ ]: <Axes: xlabel='venture', ylabel='status'>
```



Insights: Startups that have an acquired status have the largest amount of average venture fundings.

```
[ ]: df_plot = df_clean.groupby('country_code').agg({'venture': 'sum'}).reset_index()
      .sort_values('venture', ascending=False).head(11)
df_plot = df_plot[df_plot['country_code'] != 'Not Available']
sns.barplot(x=df_plot['venture'], y=df_plot['country_code'], palette='Set2')

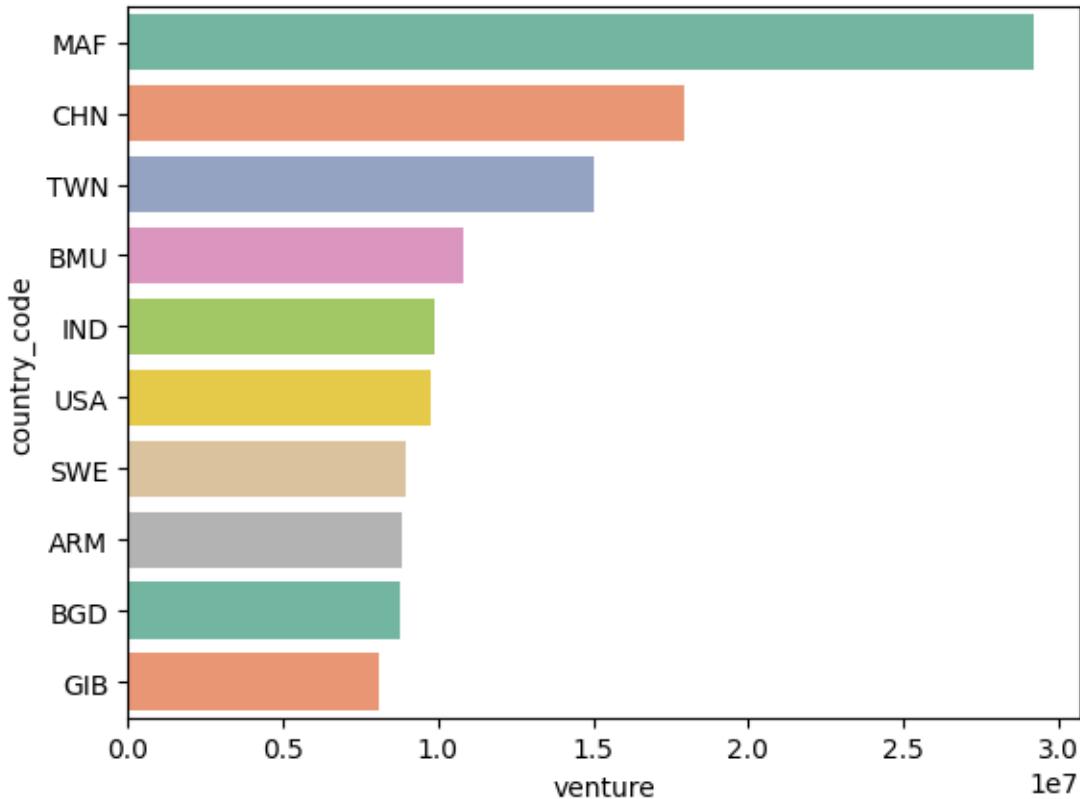
[ ]: <Axes: xlabel='venture', ylabel='country_code'>
```



Insights: From the plot of top 10 countries USA have the largest number of total venture fundings.

```
[ ]: df_plot = df_clean.groupby('country_code').agg({'venture':'mean'}).
    ↪reset_index().sort_values('venture', ascending=False).head(10)
df_plot = df_plot[df_plot['country_code']!='Not Available']
sns.barplot(x=df_plot['venture'], y=df_plot['country_code'], palette='Set2')
```

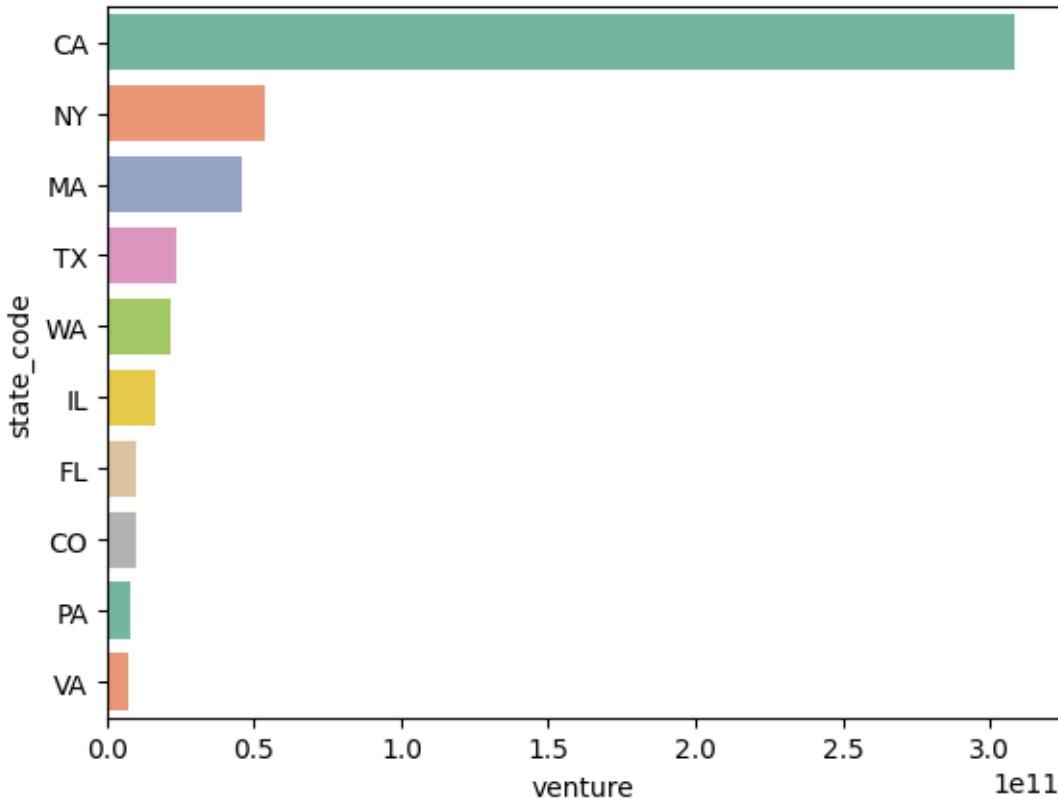
```
[ ]: <Axes: xlabel='venture', ylabel='country_code'>
```



Insights: From the plot of top 10 countries Saint Martin have the largest number of average venture fundings.

```
[ ]: df_plot = df_clean.groupby('state_code').agg({'venture':'sum'}).reset_index()
      .sort_values('venture', ascending=False).head(11)
df_plot = df_plot[df_plot['state_code']!='Not Available']
sns.barplot(x=df_plot['venture'], y=df_plot['state_code'], palette='Set2')
```

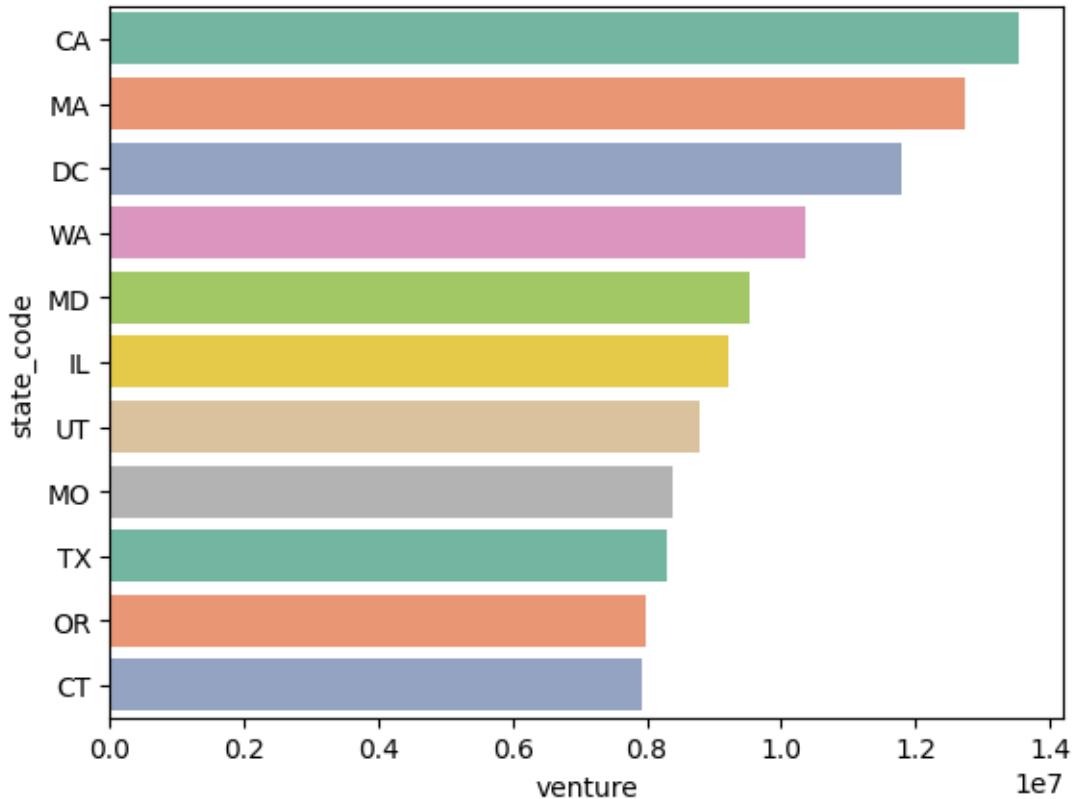
```
[ ]: <Axes: xlabel='venture', ylabel='state_code'>
```



Insights: From the plot of top 10 states California have the largest number of total fundings.

```
[ ]: df_plot = df_clean.groupby('state_code').agg({'venture':'mean'}).reset_index()
    .sort_values('venture', ascending=False).head(11)
df_plot = df_plot[df_plot['state_code']!='Not Available']
sns.barplot(x=df_plot['venture'], y=df_plot['state_code'], palette='Set2')

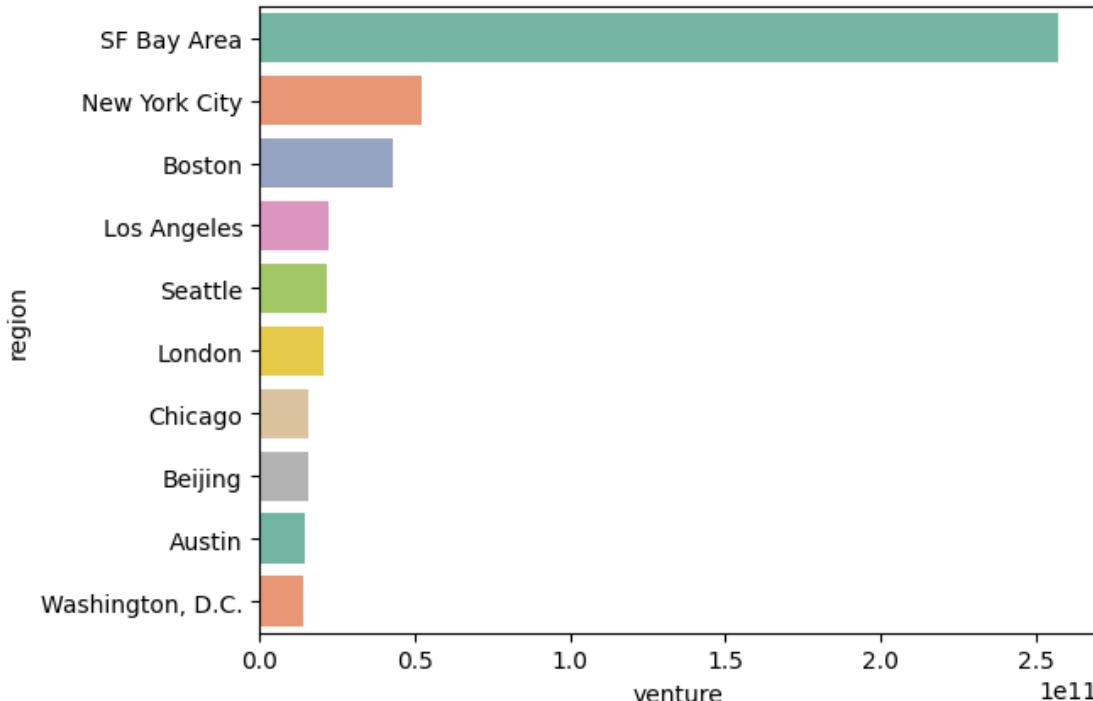
[ ]: <Axes: xlabel='venture', ylabel='state_code'>
```



Insights: From the plot of top 10 states California have the largest number of average venture fundings.

```
[ ]: df_plot = df_clean.groupby('region').agg({'venture':'sum'}).reset_index()
      .sort_values('venture', ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot['venture'], y=df_plot['region'], palette='Set2')
```

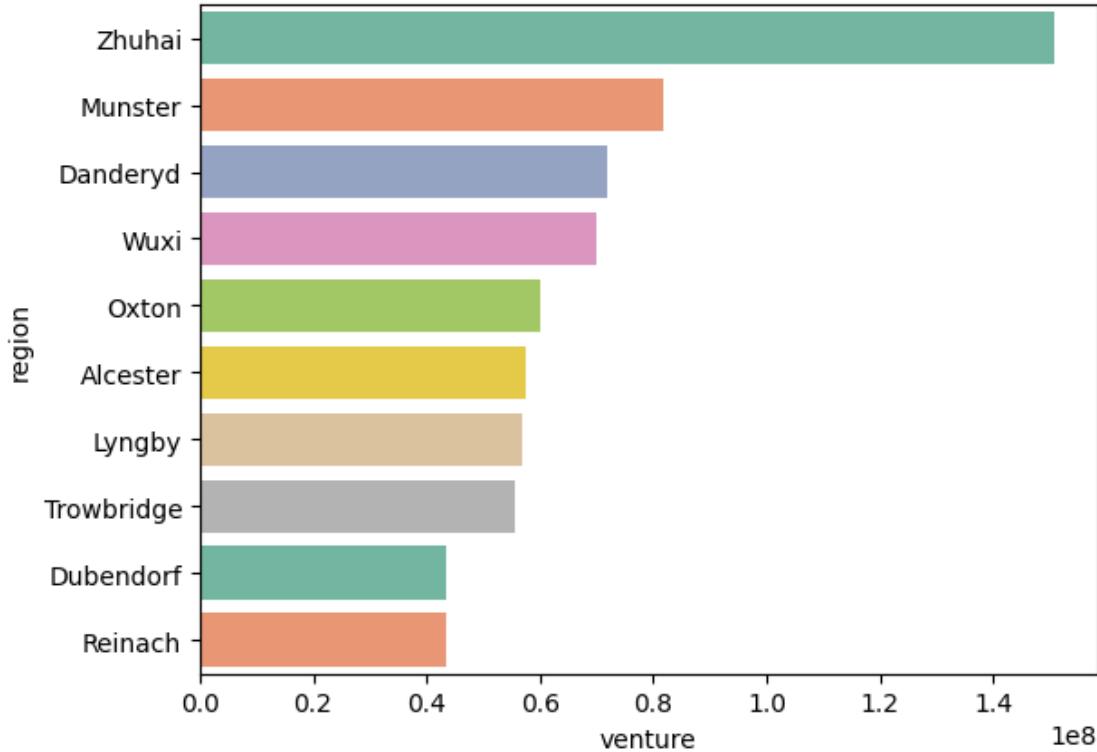
```
[ ]: <Axes: xlabel='venture', ylabel='region'>
```



Insights: From the plot of top 10 cities SF Bay Area have the largest number of total venture fundings.

```
[ ]: df_plot = df_clean.groupby('region').agg({'venture':'mean'}).reset_index()
      .sort_values('venture', ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot['venture'], y=df_plot['region'], palette='Set2')
```

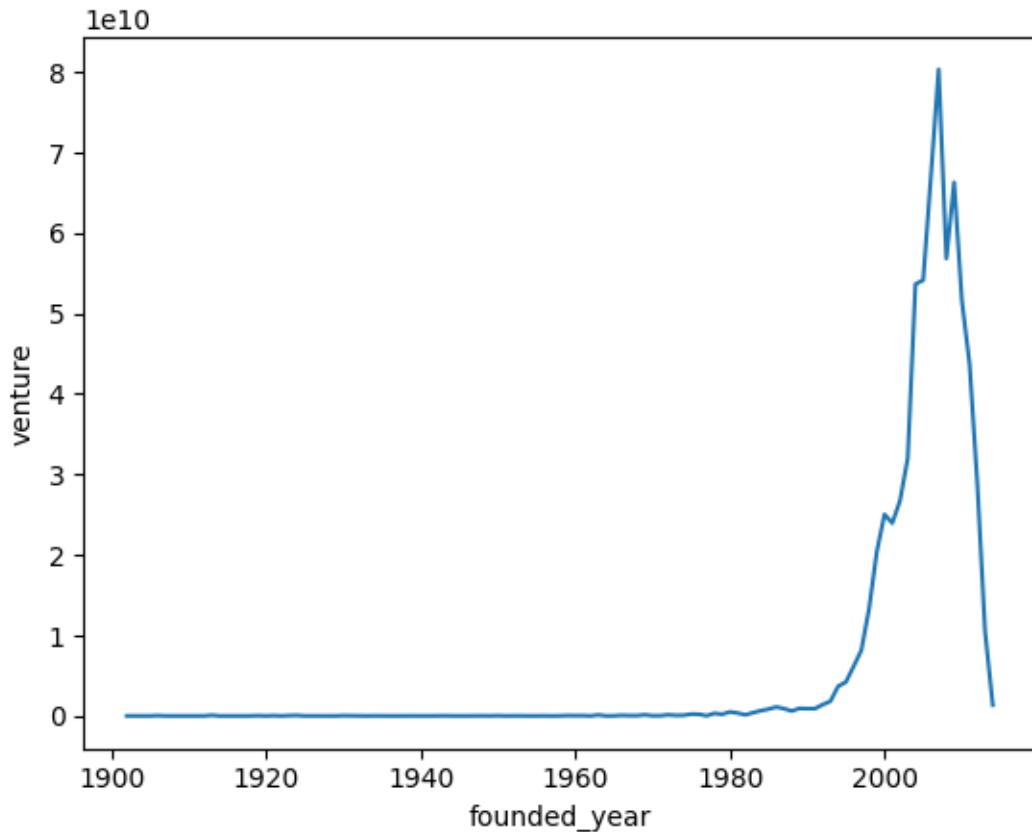
```
[ ]: <Axes: xlabel='venture', ylabel='region'>
```



Insights: From the plot of top 10 cities Zhuhai have the largest number of avergae venture fundings.

```
[ ]: df_plot = df_clean.groupby('founded_year').agg({'venture':'sum'}).reset_index().
    ↪sort_values('venture', ascending=False)
df_plot = df_plot[df_plot['founded_year'] > 1000]
sns.lineplot(y=df_plot['venture'], x=df_plot['founded_year'])
```

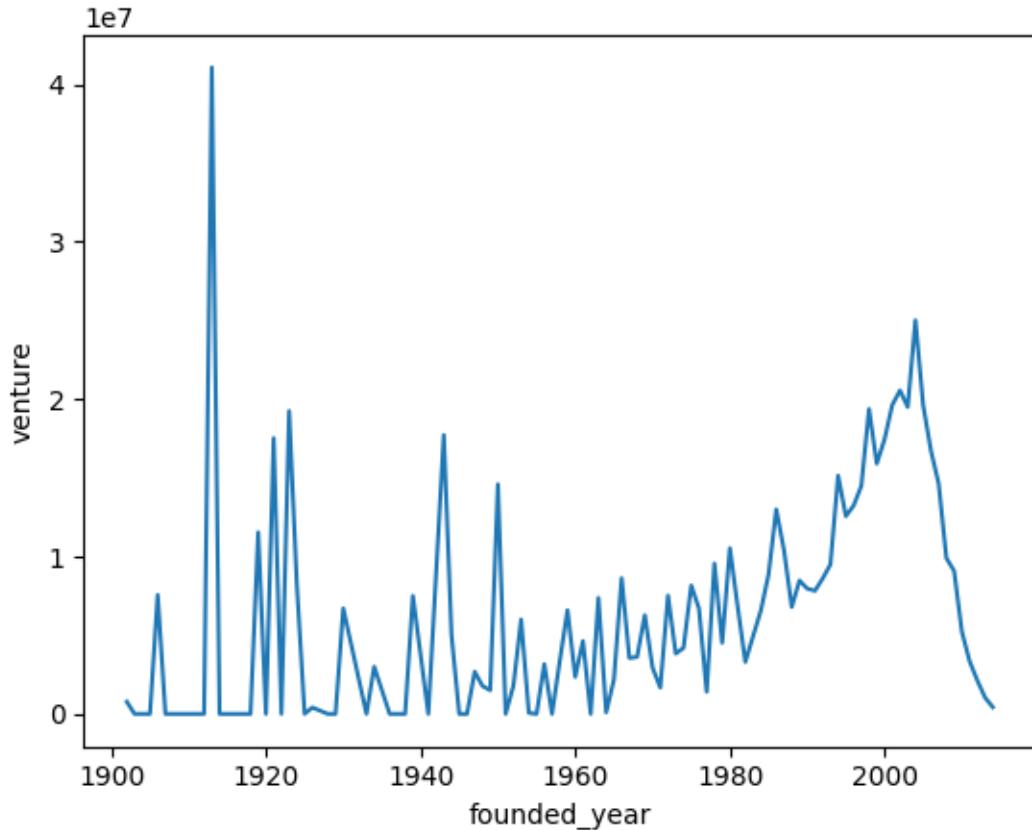
```
[ ]: <Axes: xlabel='founded_year', ylabel='venture'>
```



Insights: From the above trend it can be seen that startups founded from 1980s received the largest amount of venture fundings.

```
[ ]: df_plot = df_clean.groupby('founded_year').agg({'venture':'mean'}).
    ↪reset_index().sort_values('venture', ascending=False)
df_plot = df_plot[df_plot['founded_year'] > 1000]
sns.lineplot(y=df_plot['venture'], x=df_plot['founded_year'])
```

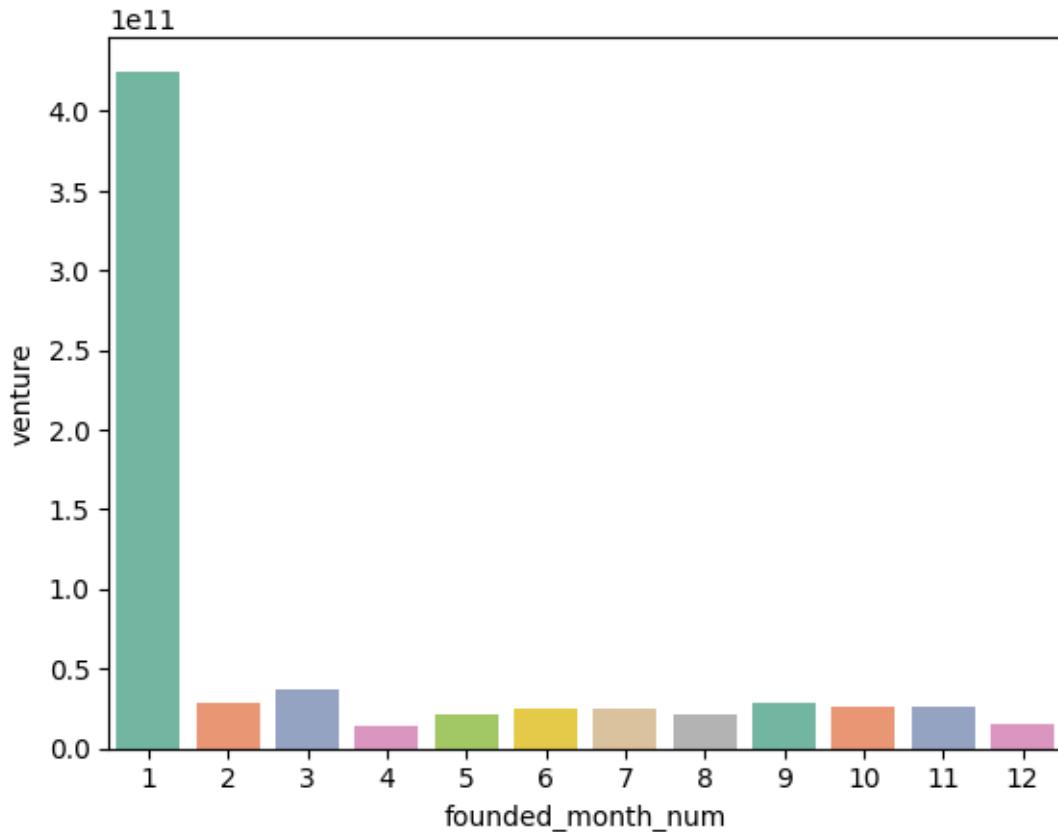
```
[ ]: <Axes: xlabel='founded_year', ylabel='venture'>
```



Insights: The average plot indicates that large number of startups were found in the 21st century while over the years from 1900 quite alot of start ups have attracted good amount of venture fundings where the year 1910 has seen the highest spike

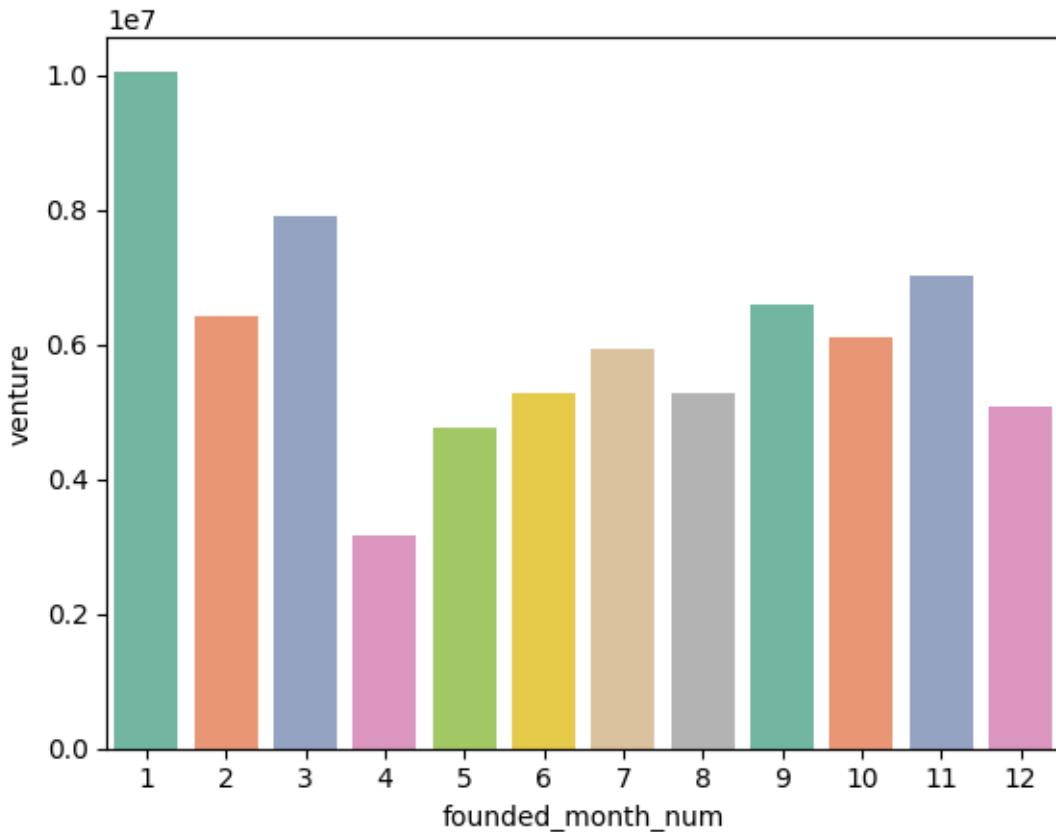
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({'venture':'sum'}) .
    .reset_index().sort_values('venture', ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot['venture'], x=df_plot['founded_month_num'], palette='Set2')

[ ]: <Axes: xlabel='founded_month_num', ylabel='venture'>
```



```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({'venture':'mean'}).
     ↪reset_index().sort_values('venture', ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot['venture'], x=df_plot['founded_month_num'], palette='Set2')
```

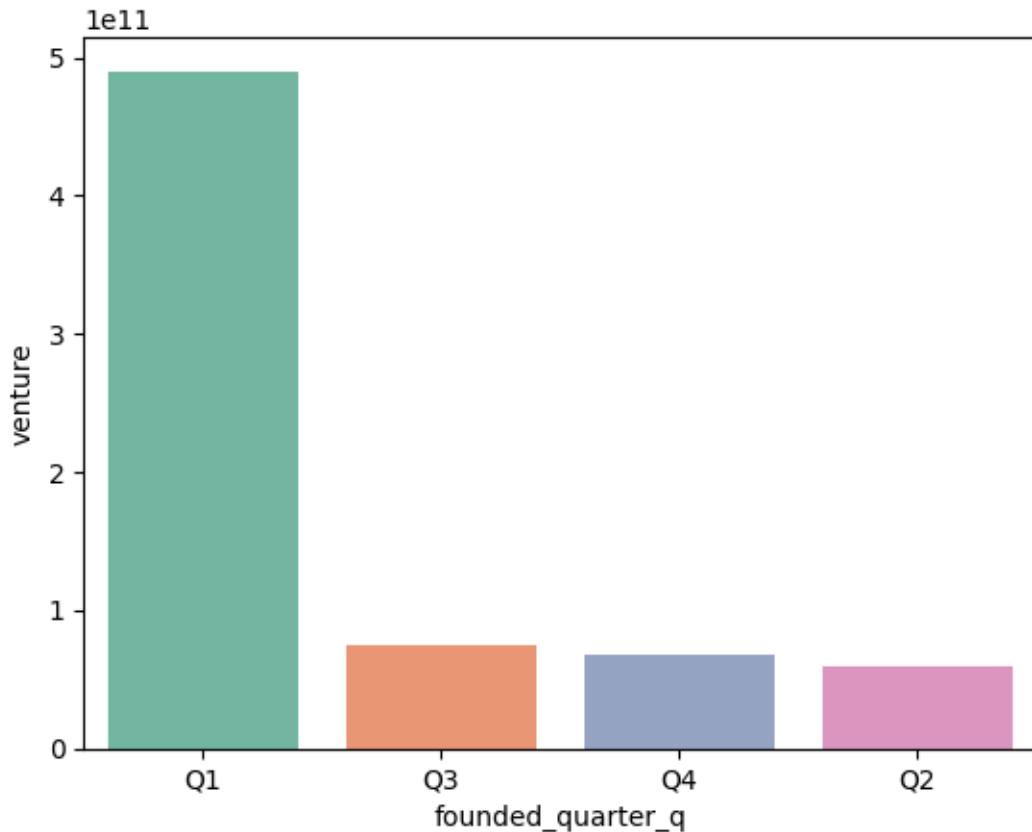
```
[ ]: <Axes: xlabel='founded_month_num', ylabel='venture'>
```



Insights: From the above plot it can be seen that start ups founded in the month of January have attracted the most amount of venture fundings

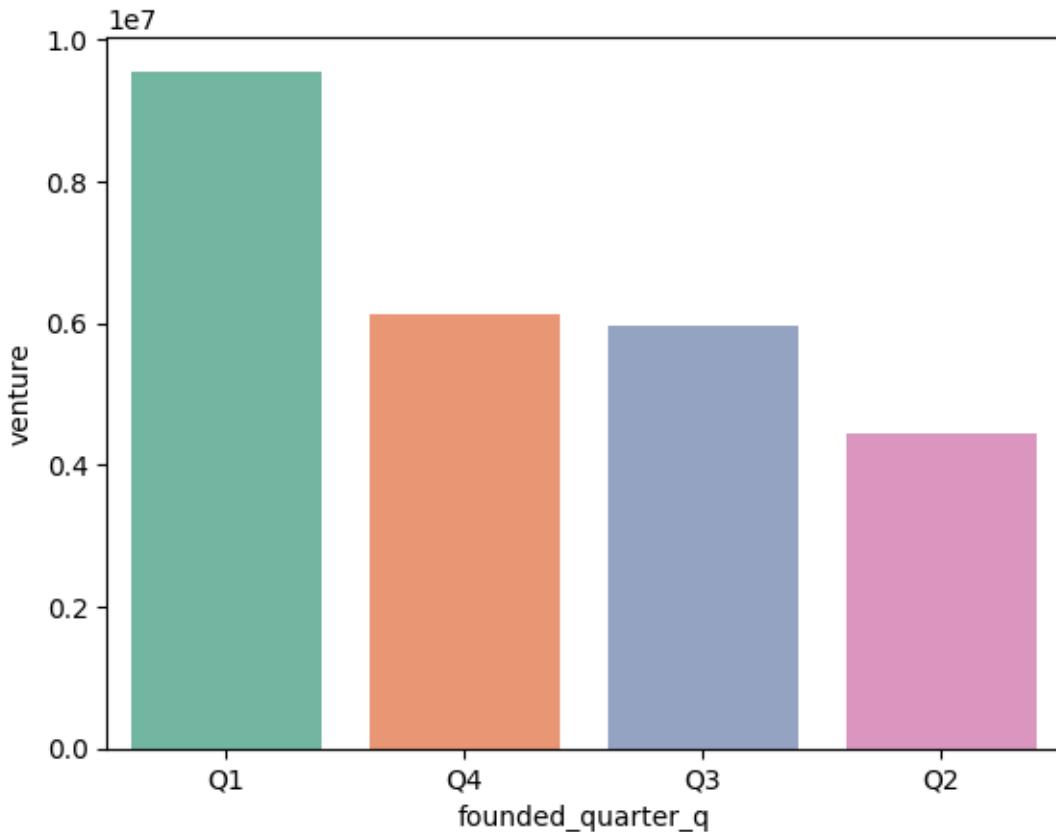
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({'venture':'sum'})  
    .reset_index().sort_values('venture', ascending=False)  
df_plot = df_plot[df_plot['founded_quarter_q']!= 'Q0']  
sns.barplot(y=df_plot['venture'], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='venture'>
```



```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({'venture':'mean'}).
    ↪reset_index().sort_values('venture', ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q']!= 'Q0']
sns.barplot(y=df_plot['venture'], x=df_plot['founded_quarter_q'], palette='Set2')

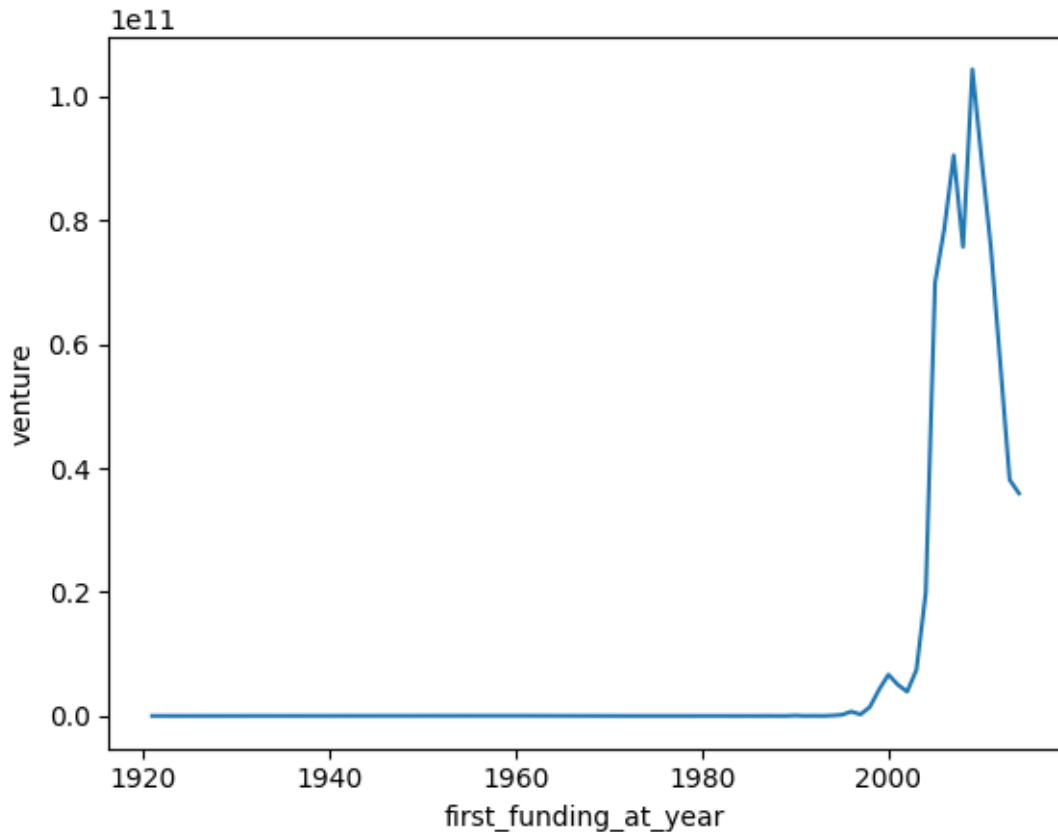
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='venture'>
```



Insights: From both plots it is evident that startups founded in the first quarter have attracted the most amount of venture fundings

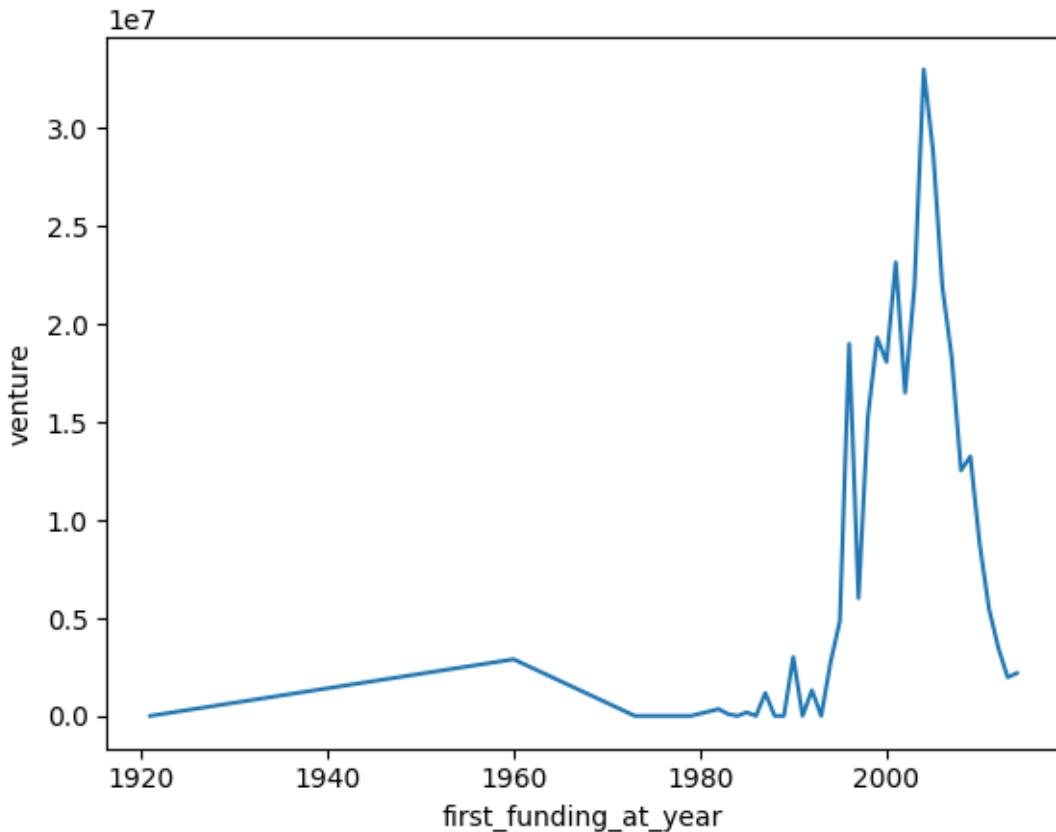
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({'venture':'sum'})  
    .reset_index().sort_values('venture', ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot['venture'], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='venture'>
```



```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({'venture':'mean'}).
    ↪reset_index().sort_values('venture', ascending=False)
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]
sns.lineplot(y=df_plot['venture'], x=df_plot['first_funding_at_year'])
```

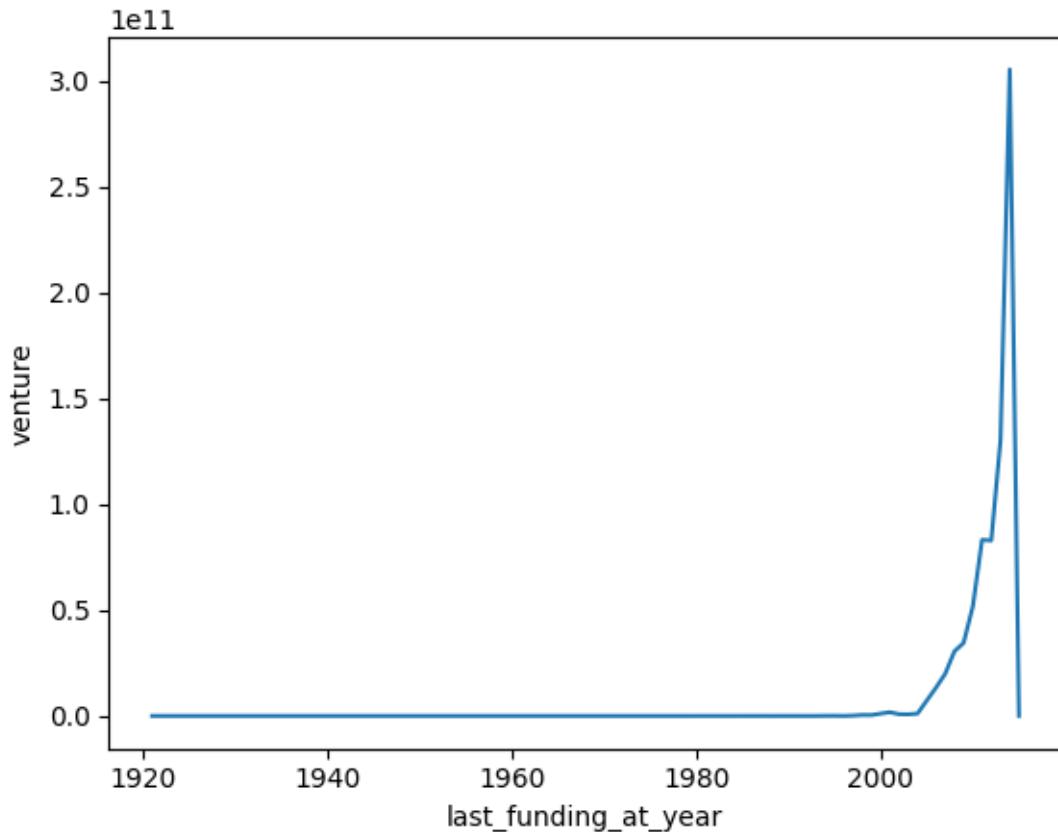
```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='venture'>
```



Insights: From the above trend it can be seen that startups found in the 21st century received the largest amount of venture fundings.

```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({'venture':'sum'}).
    ↪reset_index().sort_values('venture', ascending=False)
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]
sns.lineplot(y=df_plot['venture'], x=df_plot['last_funding_at_year'])
```

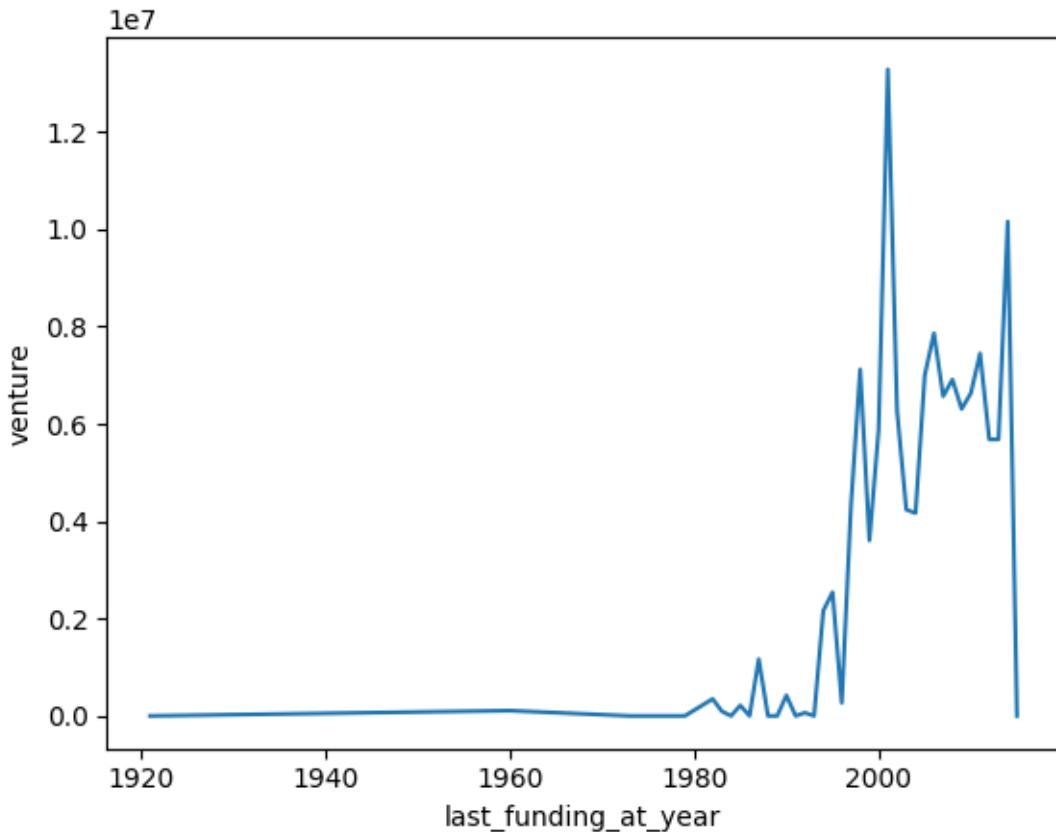
```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='venture'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of avergae funding rounds.

```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({'venture':'mean'}).
    ↪reset_index().sort_values('venture',ascending=False)
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]
sns.lineplot(y=df_plot['venture'], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='venture'>
```



Insights: It can be seen from the plots that a lot of startups that received their last funding in the early 21st century attracted a large amount of venture fundings.

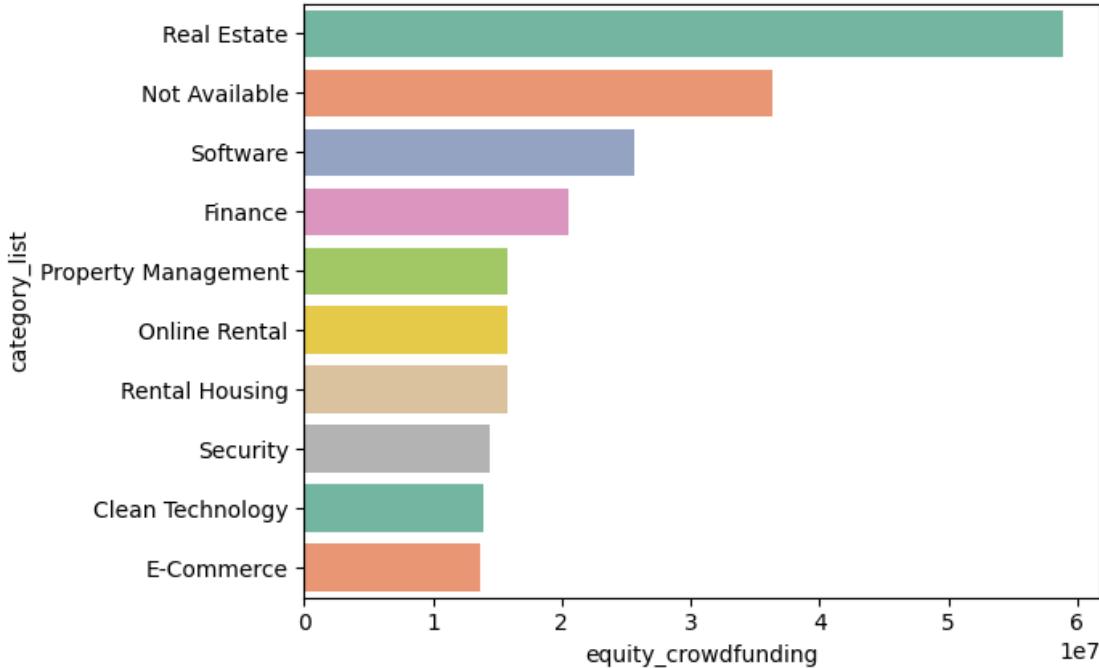
## 1.7 Equity Crowd Funding

1. Equity crowdfunding is a method of raising capital used by startups and early-stage companies.
2. Essentially, equity crowdfunding offers the company's securities to a number of potential investors in exchange for financing.
3. Each investor is entitled to a stake in the company proportional to their investment.

Average and Total Analysis of the Equity Crowd Funded Funds as shown below.

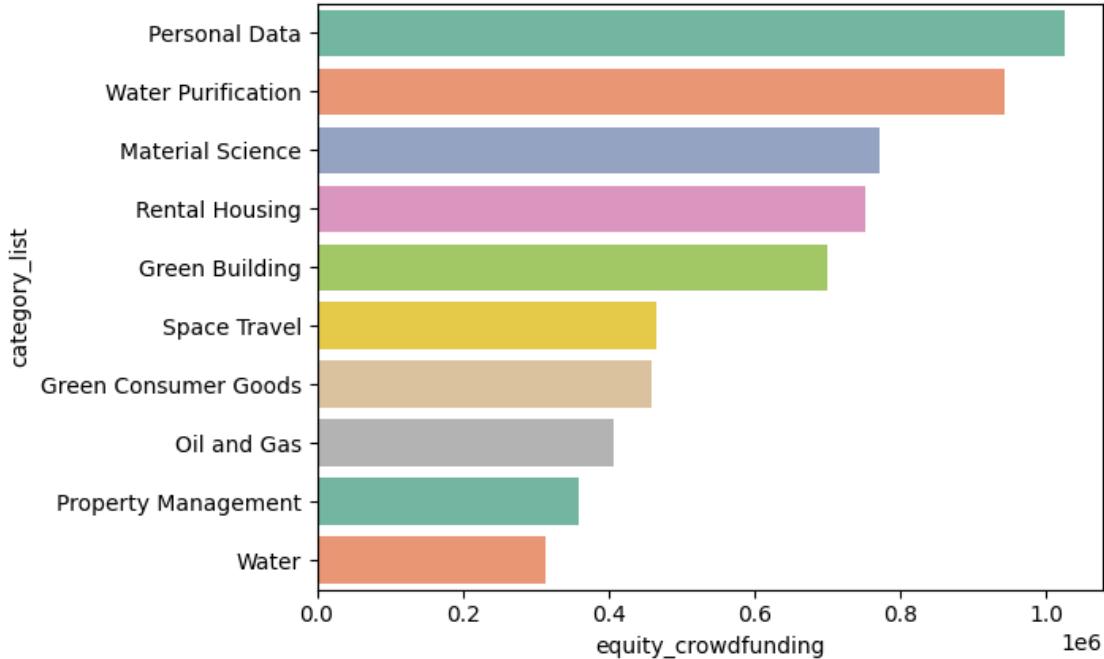
```
[ ]: df_plot = df_clean.groupby('category_list').agg({'equity_crowdfunding':'sum'})\
    .reset_index().sort_values('equity_crowdfunding', ascending=False).head(10)
sns.barplot(x=df_plot['equity_crowdfunding'], y=df_plot['category_list'], palette='Set2')
```

```
[ ]: <Axes: xlabel='equity_crowdfunding', ylabel='category_list'>
```



Insights: From the plot of top 10 categories Real Estate have the largest number of total crowd fundings.

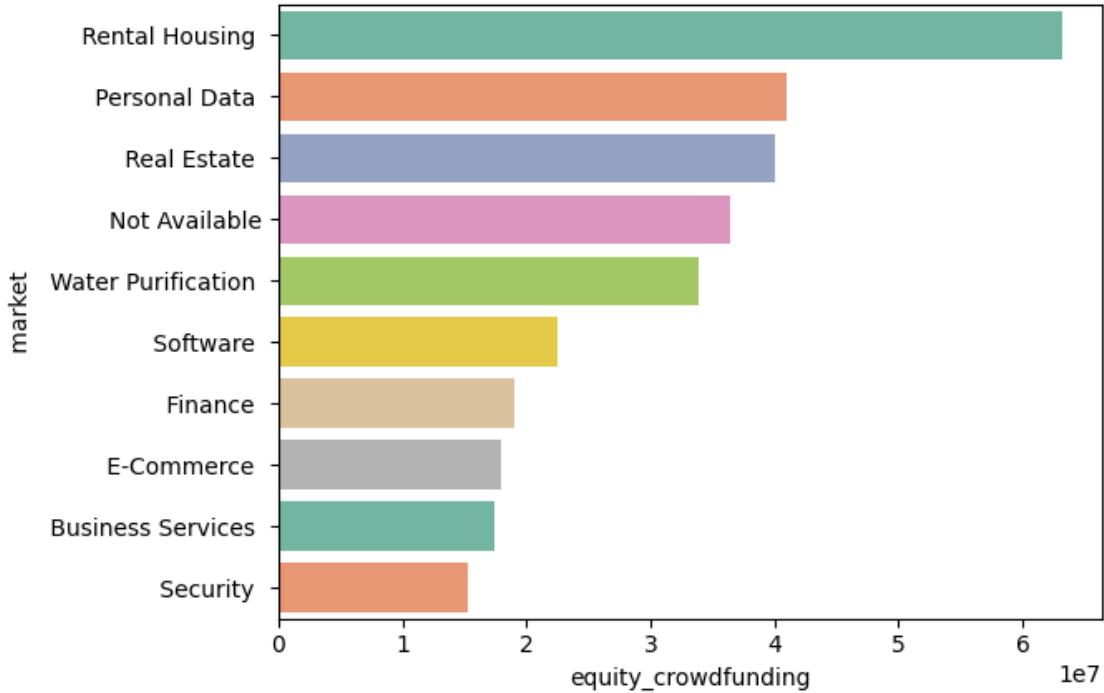
```
[ ]: df_plot = df_clean.groupby('category_list').agg({'equity_crowdfunding':'mean'})  
    .reset_index().sort_values('equity_crowdfunding', ascending=False).head(10)  
sns.barplot(x=df_plot['equity_crowdfunding'],  
            y=df_plot['category_list'], palette='Set2')  
  
[ ]: <Axes: xlabel='equity_crowdfunding', ylabel='category_list'>
```



Insights: From the plot of top 10 categories Personal Data have the largest number of avergae crowd fundings.

```
[ ]: df_plot = df_clean.groupby(' market ').agg({'equity_crowdfunding':'sum'}).
    ↪reset_index().sort_values('equity_crowdfunding',ascending=False).head(10)
sns.barplot(x=df_plot['equity_crowdfunding'], y=df_plot[' market ']
    ↪], palette='Set2')
```

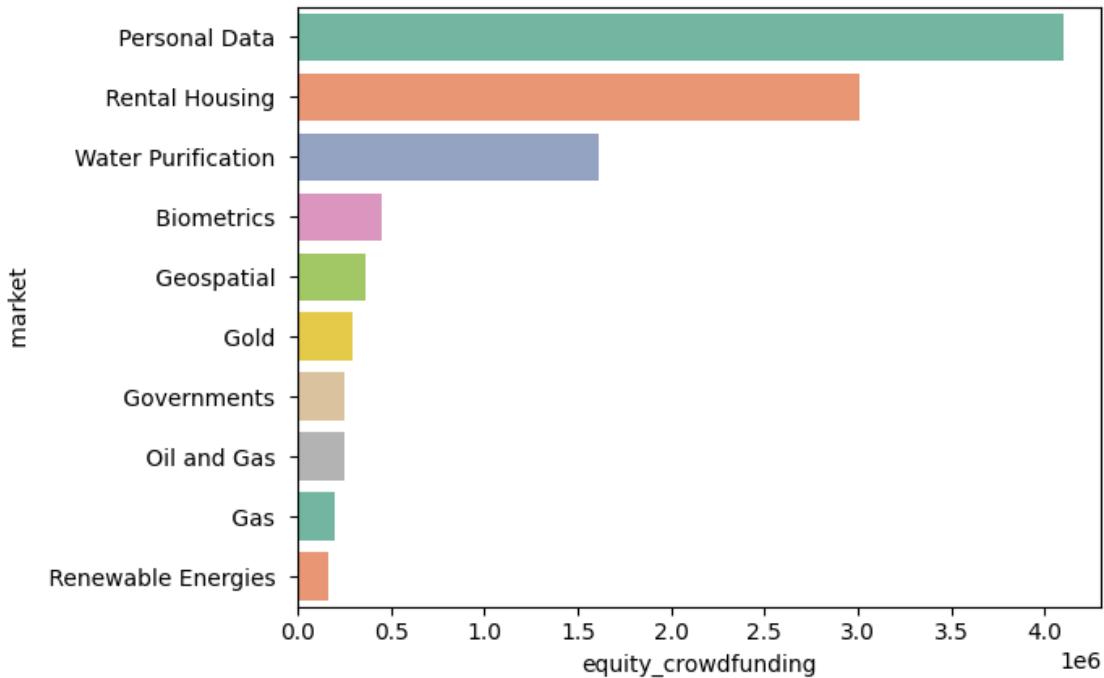
```
[ ]: <Axes: xlabel='equity_crowdfunding', ylabel=' market '>
```



Insights: From the plot of top 10 markets Rental Housing have the largest number of total crowd fundings.

```
[ ]: df_plot = df_clean.groupby(' market ').agg({'equity_crowdfunding':'mean'}).
    ↪reset_index().sort_values('equity_crowdfunding',ascending=False).head(10)
sns.barplot(x=df_plot['equity_crowdfunding'], y=df_plot[' market '],
    ↪],palette='Set2')
```

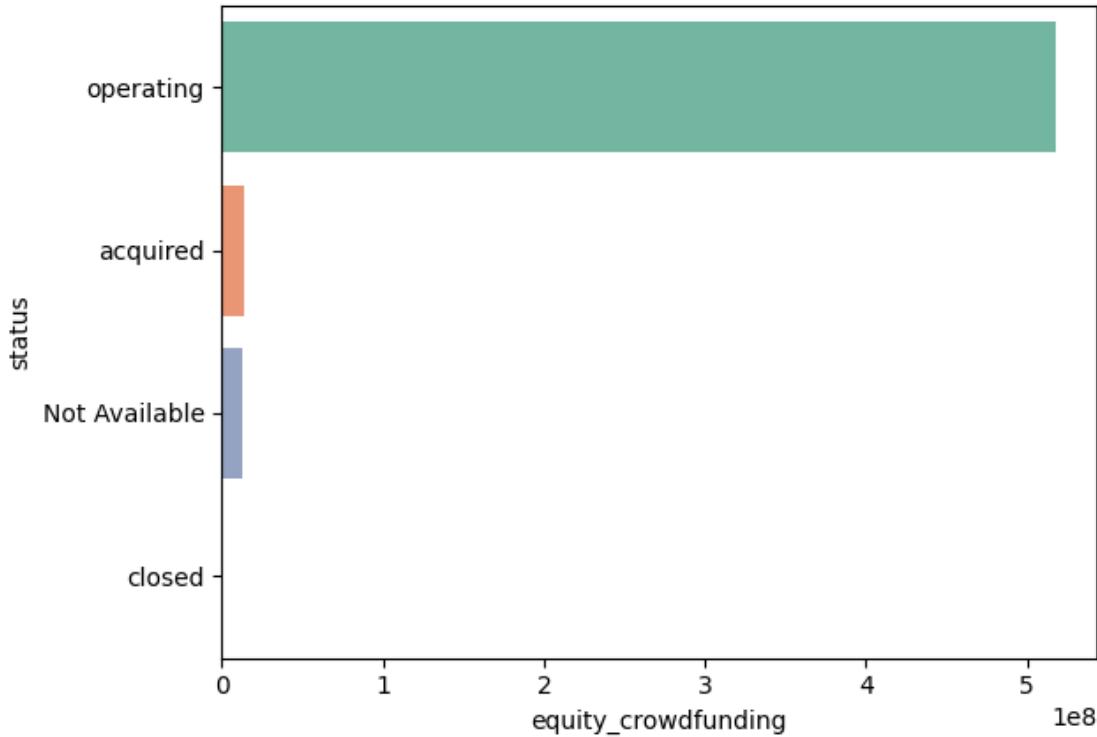
```
[ ]: <Axes: xlabel='equity_crowdfunding', ylabel=' market '>
```



Insights: From the plot of top 10 categories Personal Data have the largest number of average crowd fundings.

```
[ ]: df_plot = df_clean.groupby('status').agg({'equity_crowdfunding':'sum'}).
    ↪reset_index().sort_values('equity_crowdfunding',ascending=False).head(10)
sns.barplot(x=df_plot['equity_crowdfunding'], ↪
    ↪y=df_plot['status'], palette='Set2')
```

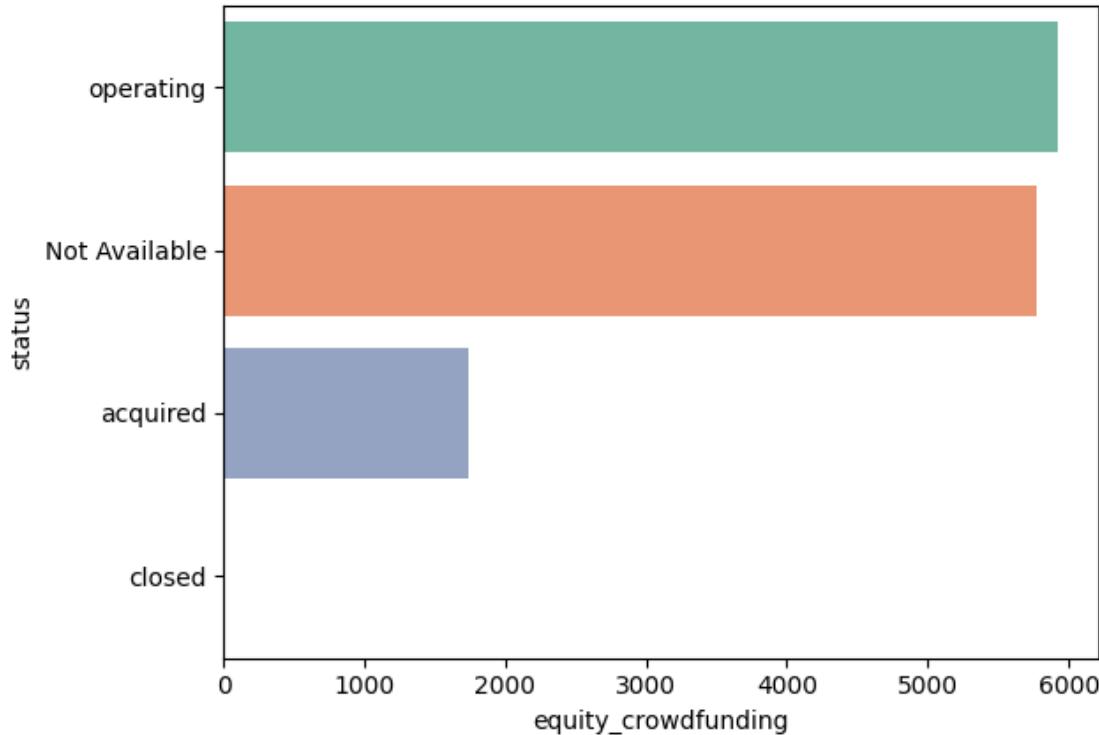
```
[ ]: <Axes: xlabel='equity_crowdfunding', ylabel='status'>
```



Insights: Startups that have an operating status have the largest amount of total crowd fundings.

```
[ ]: df_plot = df_clean.groupby('status').agg({'equity_crowdfunding':'mean'}).
    ↪reset_index().sort_values('equity_crowdfunding', ascending=False).head(10)
sns.barplot(x=df_plot['equity_crowdfunding'], ↪
    ↪y=df_plot['status'], palette='Set2')

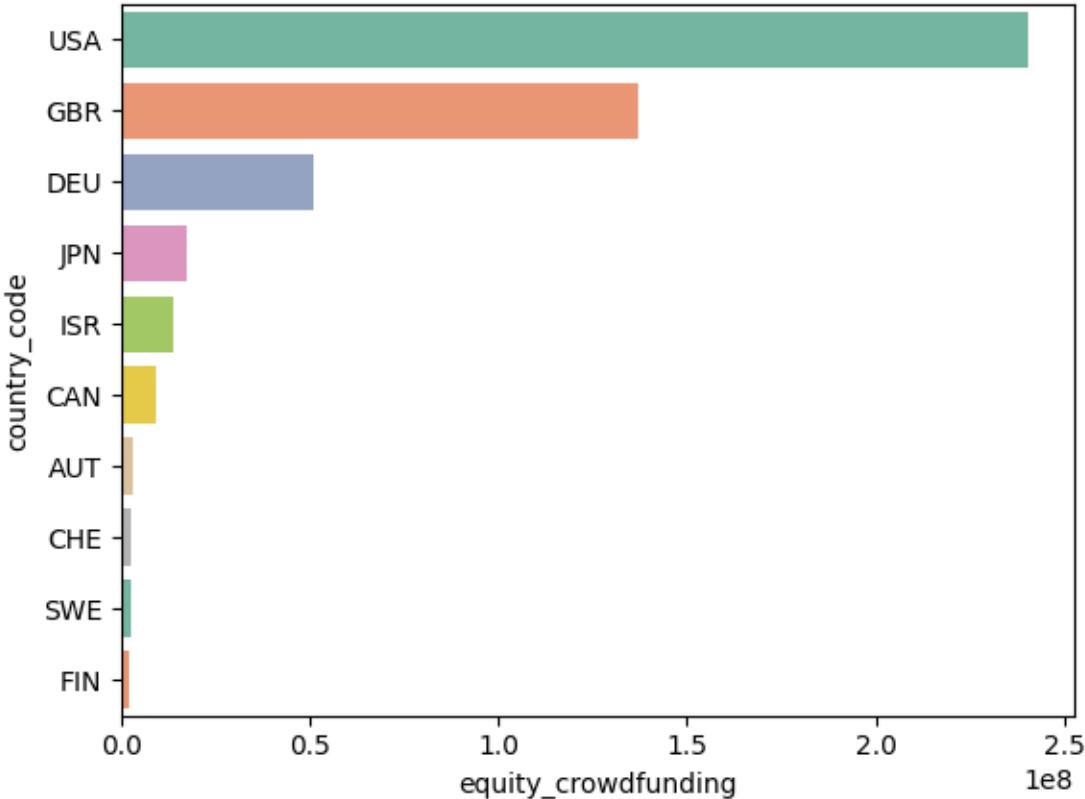
[ ]: <Axes: xlabel='equity_crowdfunding', ylabel='status'>
```



Insights: Startups that have an operating status have the largest amount of average crowd fundings.

```
[ ]: df_plot = df_clean.groupby('country_code').agg({'equity_crowdfunding':'sum'})  
    ↪reset_index().sort_values('equity_crowdfunding',ascending=False).head(11)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot['equity_crowdfunding'],  
    ↪y=df_plot['country_code'],palette='Set2')
```

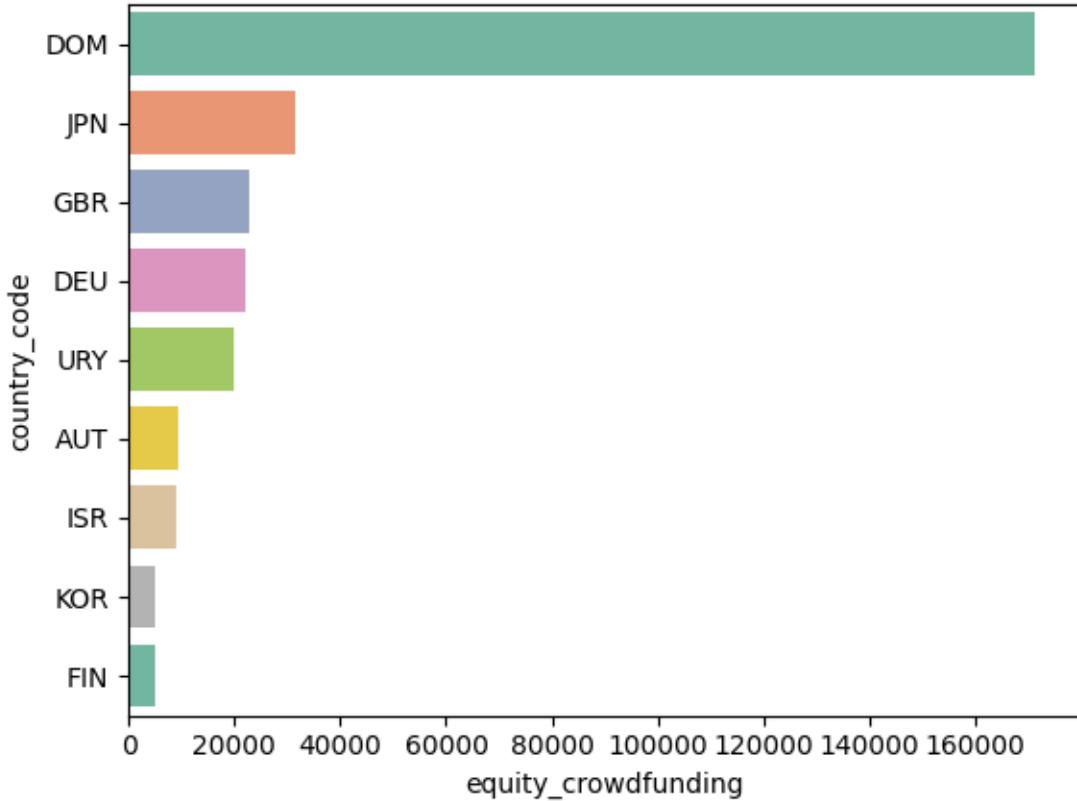
```
[ ]: <Axes: xlabel='equity_crowdfunding', ylabel='country_code'>
```



Insights: From the plot of top 10 countries USA have the largest number of total crowd fundings.

```
[ ]: df_plot = df_clean.groupby('country_code').agg({'equity_crowdfunding':'mean'}) .
    ↪reset_index().sort_values('equity_crowdfunding',ascending=False).head(10)
df_plot = df_plot[df_plot['country_code']!='Not Available']
sns.barplot(x=df_plot['equity_crowdfunding'], ↪
    ↪y=df_plot['country_code'], palette='Set2')
```

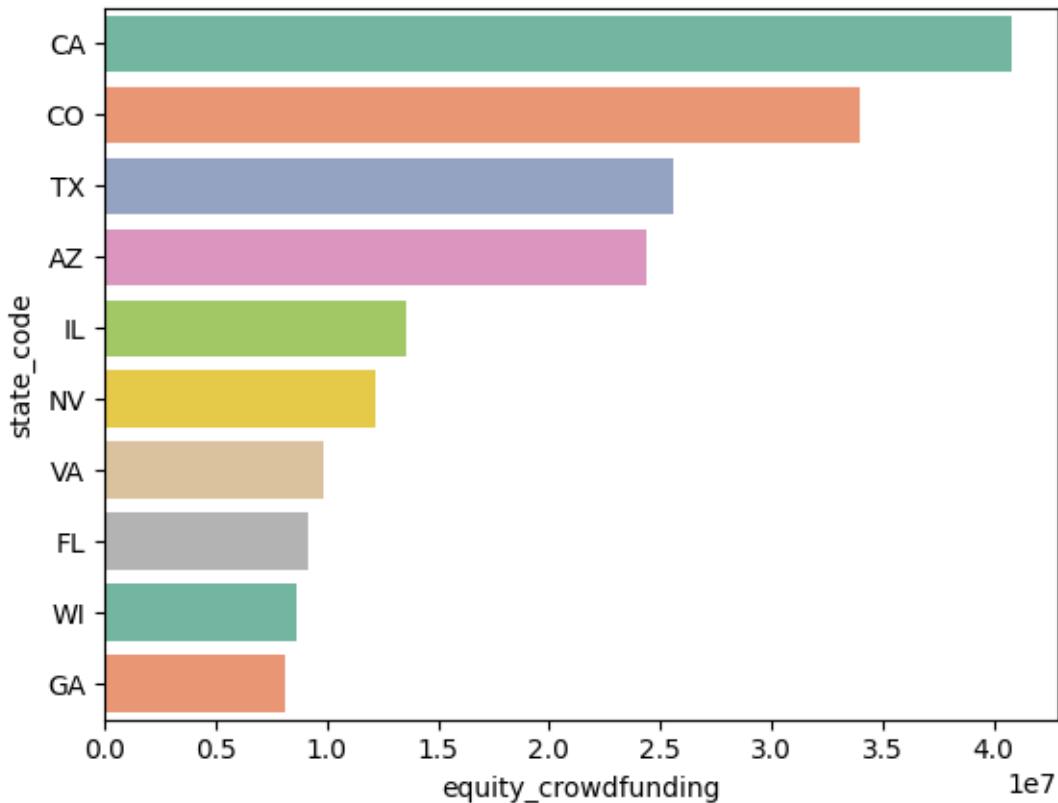
```
[ ]: <Axes: xlabel='equity_crowdfunding', ylabel='country_code'>
```



Insights: From the plot of top 10 categories Dominican Republic have the largest number of average crowd fundings.

```
[ ]: df_plot = df_clean.groupby('state_code').agg({'equity_crowdfunding': 'sum'}).
    ↪reset_index().sort_values('equity_crowdfunding', ascending=False).head(11)
df_plot = df_plot[df_plot['state_code'] != 'Not Available']
sns.barplot(x=df_plot['equity_crowdfunding'], ↪
    ↪y=df_plot['state_code'], palette='Set2')
```

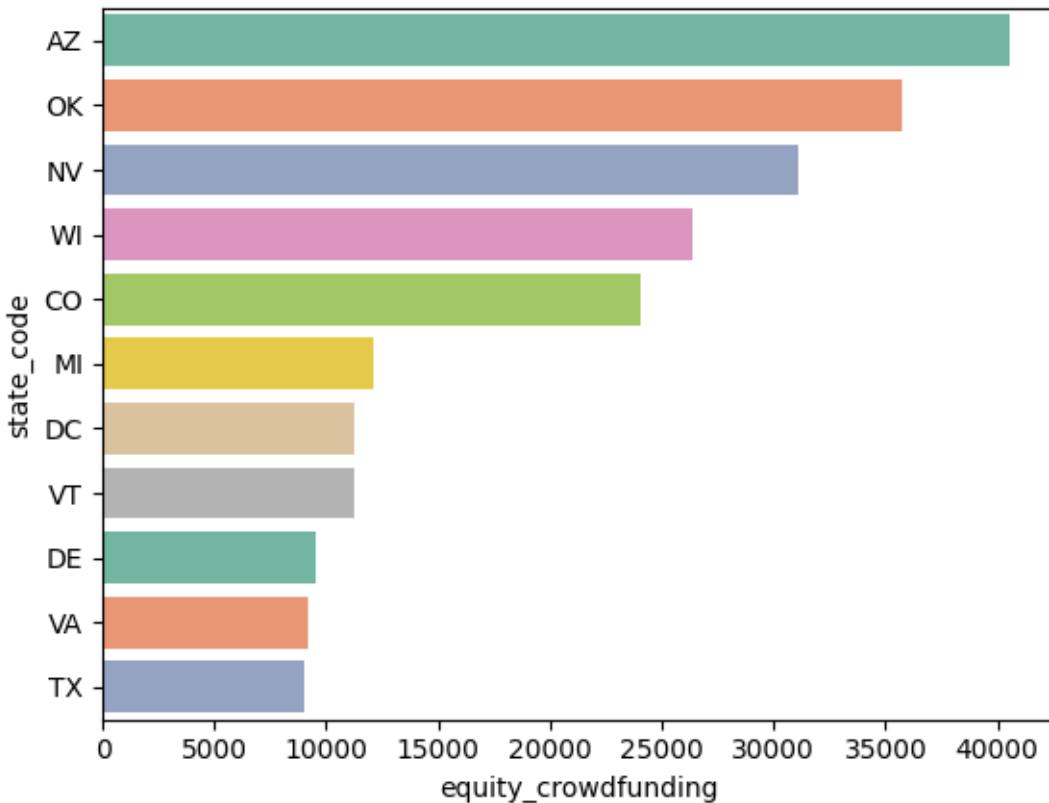
```
[ ]: <Axes: xlabel='equity_crowdfunding', ylabel='state_code'>
```



Insights: From the plot of top 10 states California have the largest number of total crowd fundings.

```
[ ]: df_plot = df_clean.groupby('state_code').agg({'equity_crowdfunding':'mean'})  
    .reset_index().sort_values('equity_crowdfunding', ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot['equity_crowdfunding'],  
            y=df_plot['state_code'], palette='Set2')
```

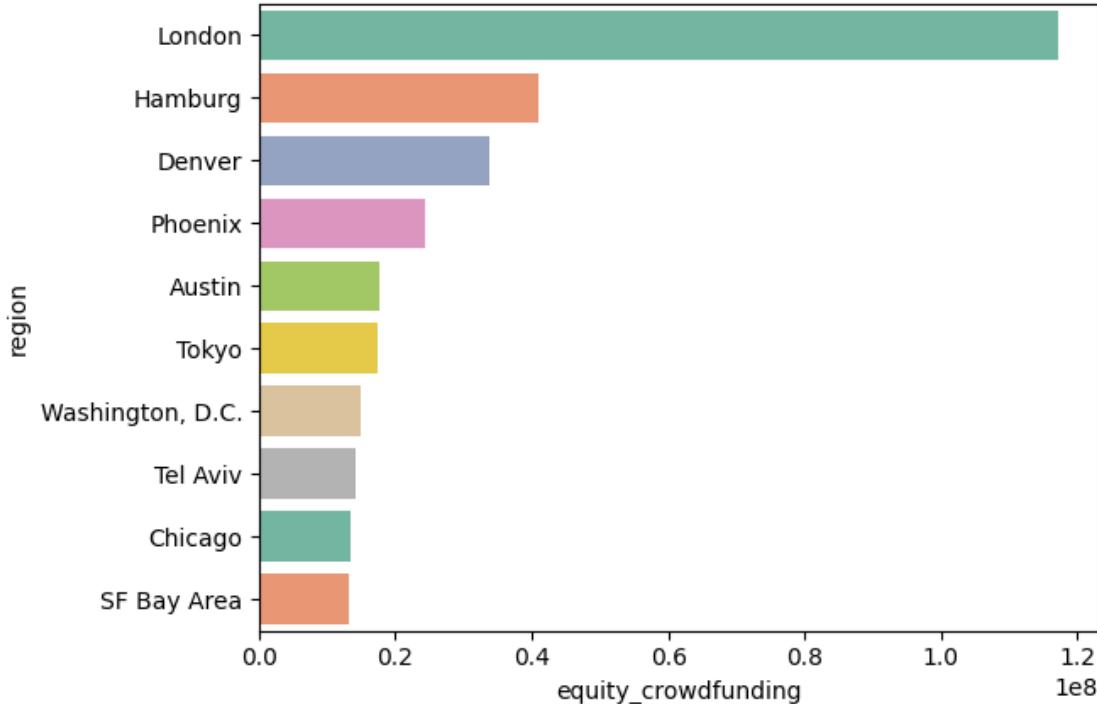
```
[ ]: <Axes: xlabel='equity_crowdfunding', ylabel='state_code'>
```



Insights: From the plot of top 10 states Arizona have the largest number of avergae crowd fundings.

```
[ ]: df_plot = df_clean.groupby('region').agg({'equity_crowdfunding':'sum'}).
    ↪reset_index().sort_values('equity_crowdfunding',ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot['equity_crowdfunding'], ↪
    ↪y=df_plot['region'], palette='Set2')
```

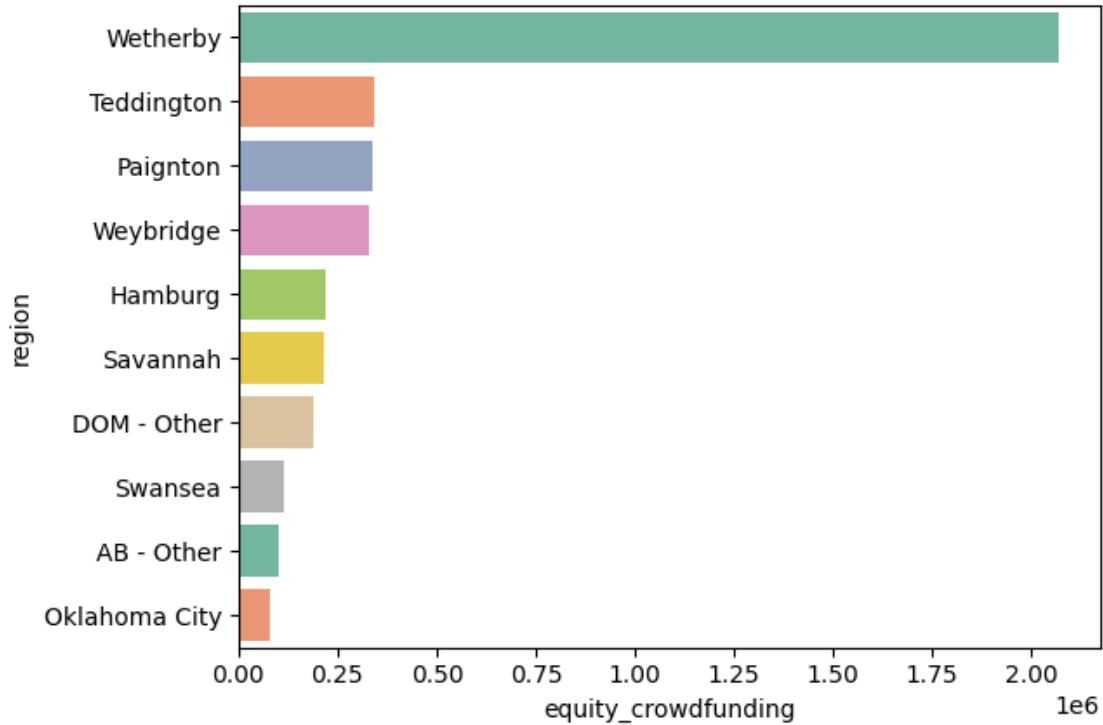
```
[ ]: <Axes: xlabel='equity_crowdfunding', ylabel='region'>
```



Insights: From the plot of top 10 cities London have the largest number of total crowd fundings.

```
[ ]: df_plot = df_clean.groupby('region').agg({'equity_crowdfunding':'mean'}).
    ↪reset_index().sort_values('equity_crowdfunding', ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot['equity_crowdfunding'], ↪
    ↪y=df_plot['region'], palette='Set2')

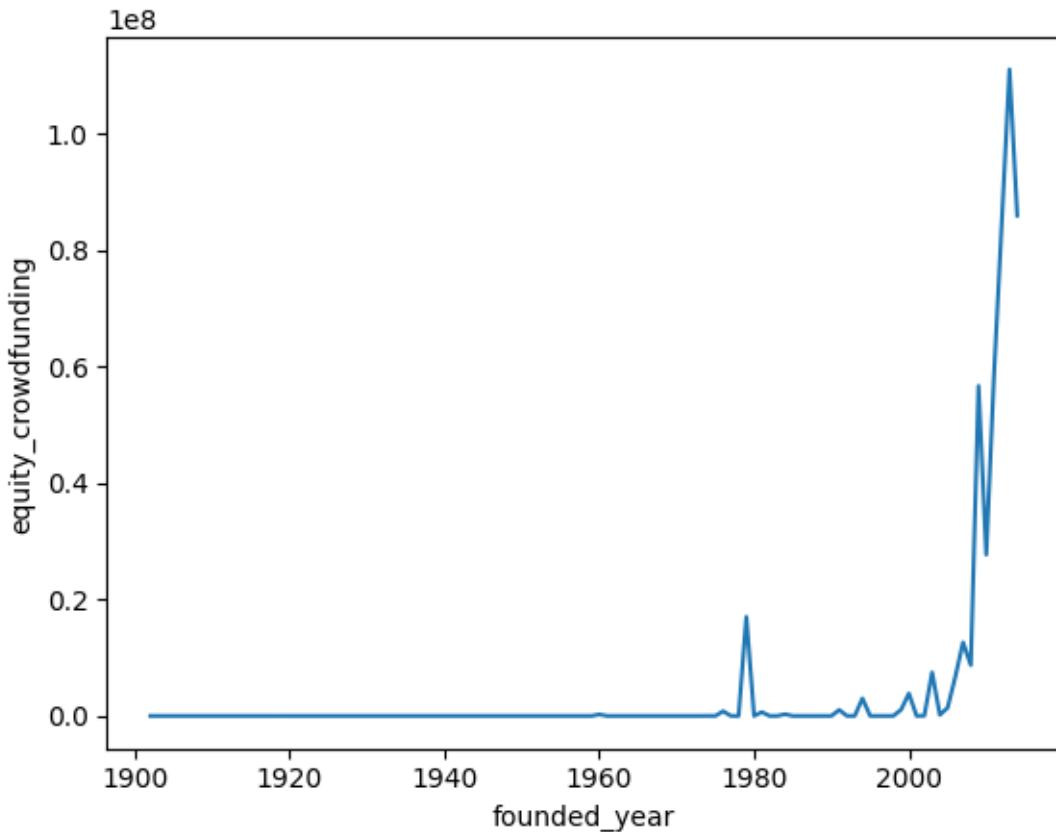
[ ]: <Axes: xlabel='equity_crowdfunding', ylabel='region'>
```



Insights: From the plot of top 10 cities Wetherby have the largest number of avergae crowd fundings.

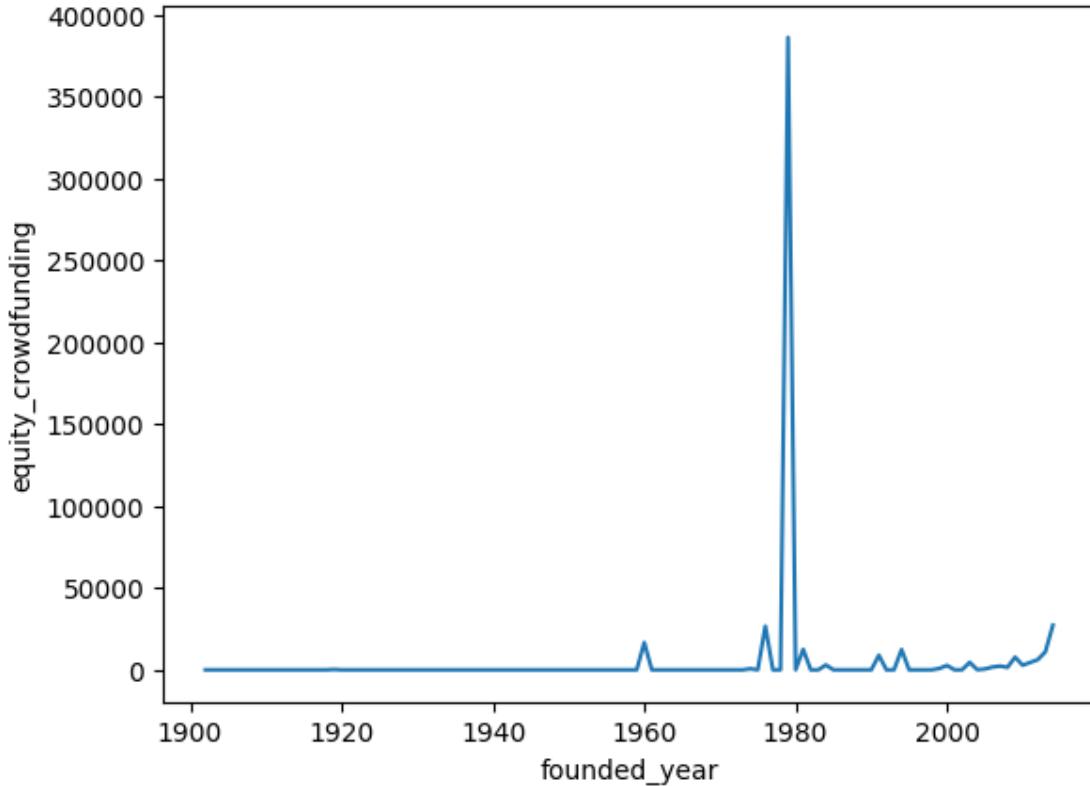
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({'equity_crowdfunding':'sum'}).
      ↪reset_index().sort_values('equity_crowdfunding', ascending=False)
df_plot = df_plot[df_plot['founded_year'] > 1000]
sns.lineplot(y=df_plot['equity_crowdfunding'], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='equity_crowdfunding'>
```



```
[ ]: df_plot = df_clean.groupby('founded_year').agg({'equity_crowdfunding':'mean'})  
    .reset_index().sort_values('equity_crowdfunding', ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot['equity_crowdfunding'], x=df_plot['founded_year'])
```

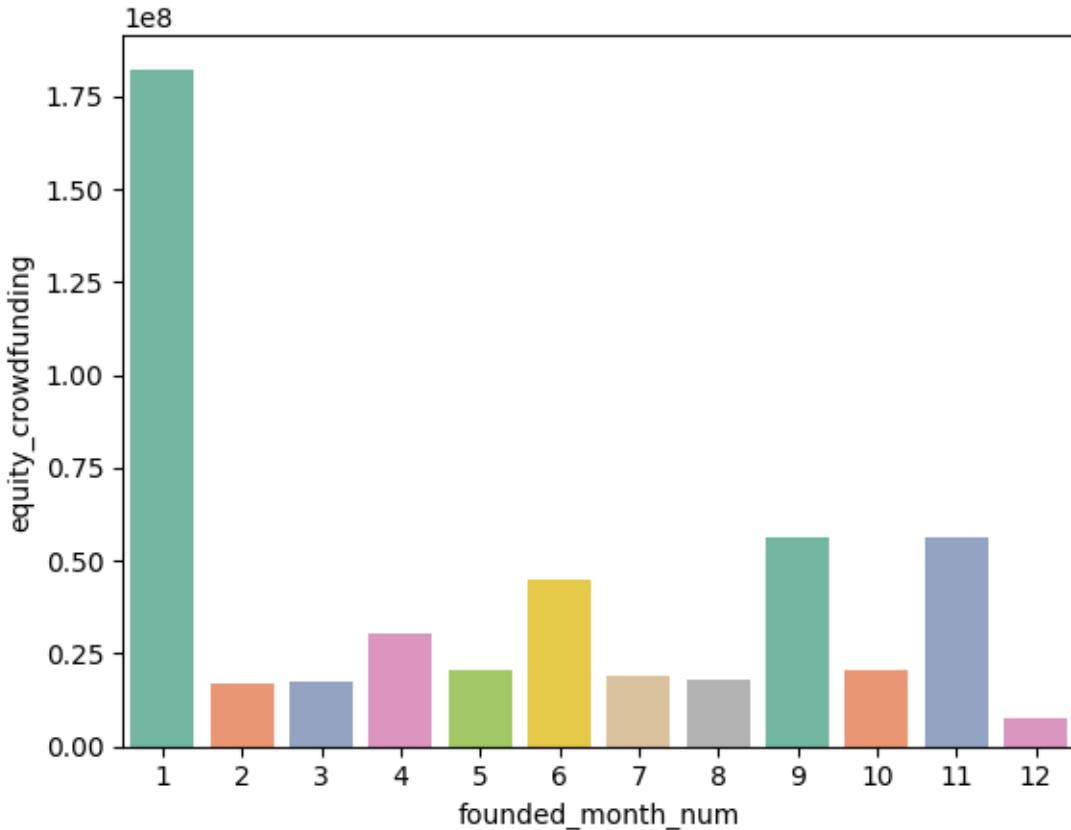
```
[ ]: <Axes: xlabel='founded_year', ylabel='equity_crowdfunding'>
```



Insights: From the above trend it can be seen that startups founded in the 21st century received the largest amount of crowd fundings where the highest spike witnessed was in the year 1980

```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({'equity_crowdfunding':
    ↴'sum'}).reset_index().sort_values('equity_crowdfunding', ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot['equity_crowdfunding'], ↴
    ↴x=df_plot['founded_month_num'], palette='Set2')
```

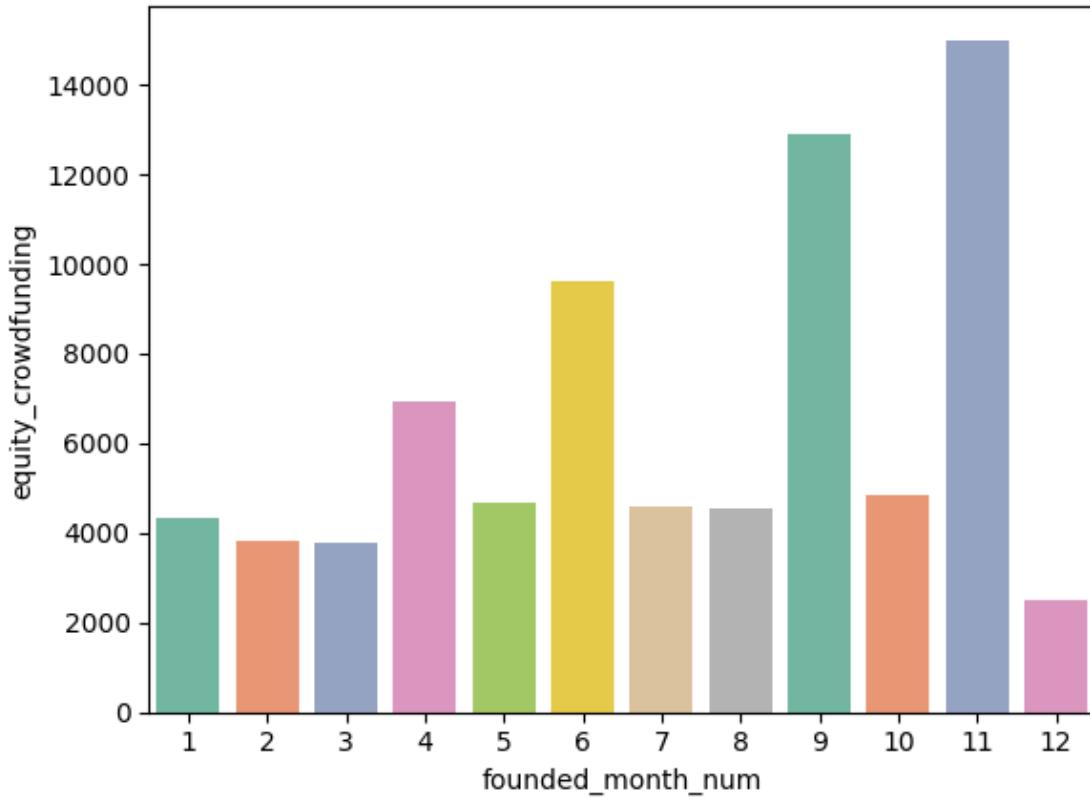
```
[ ]: <Axes: xlabel='founded_month_num', ylabel='equity_crowdfunding'>
```



Insights: From the above plot it can be seen that start ups founded in the month of January have attracted the most amount of crowd fundings

```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({'equity_crowdfunding':
    ↴'mean'}).reset_index().sort_values('equity_crowdfunding', ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot['equity_crowdfunding'], ↴
    ↴x=df_plot['founded_month_num'], palette='Set2')
```

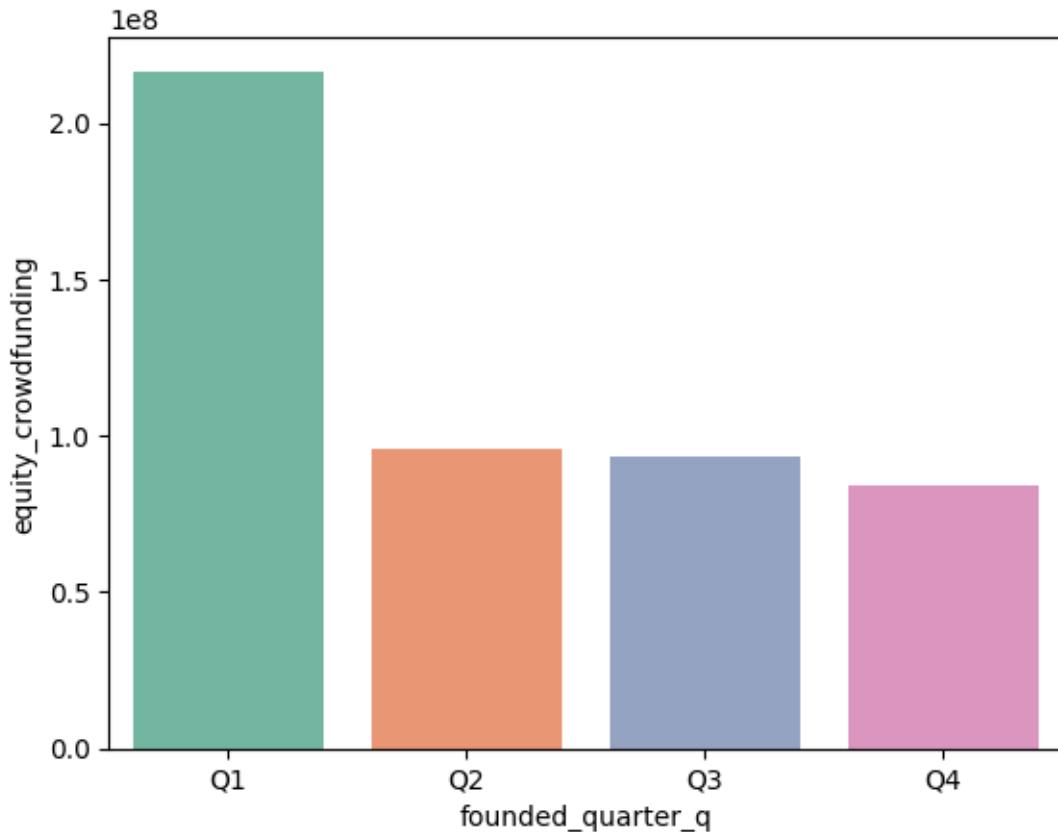
```
[ ]: <Axes: xlabel='founded_month_num', ylabel='equity_crowdfunding'>
```



Insights: From the above plot it can be seen that start ups founded in the month of November have attracted the highest average amount of crowd fundings

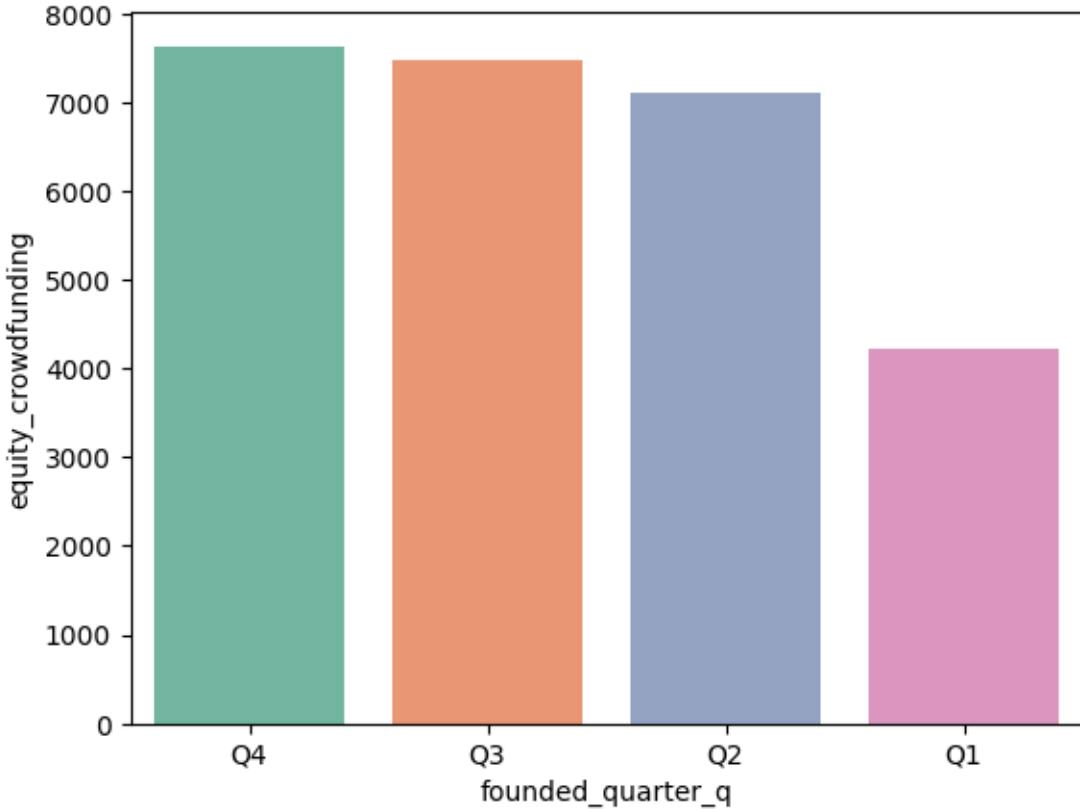
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({'equity_crowdfunding':
    ↪'sum'}).reset_index().sort_values('equity_crowdfunding', ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q']!= 'Q0']
sns.barplot(y=df_plot['equity_crowdfunding'], ↪
    ↪x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='equity_crowdfunding'>
```



```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({'equity_crowdfunding':  
    ↪'mean'}).reset_index().sort_values('equity_crowdfunding', ascending=False)  
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']  
sns.barplot(y=df_plot['equity_crowdfunding'],  
    ↪x=df_plot['founded_quarter_q'], palette='Set2')
```

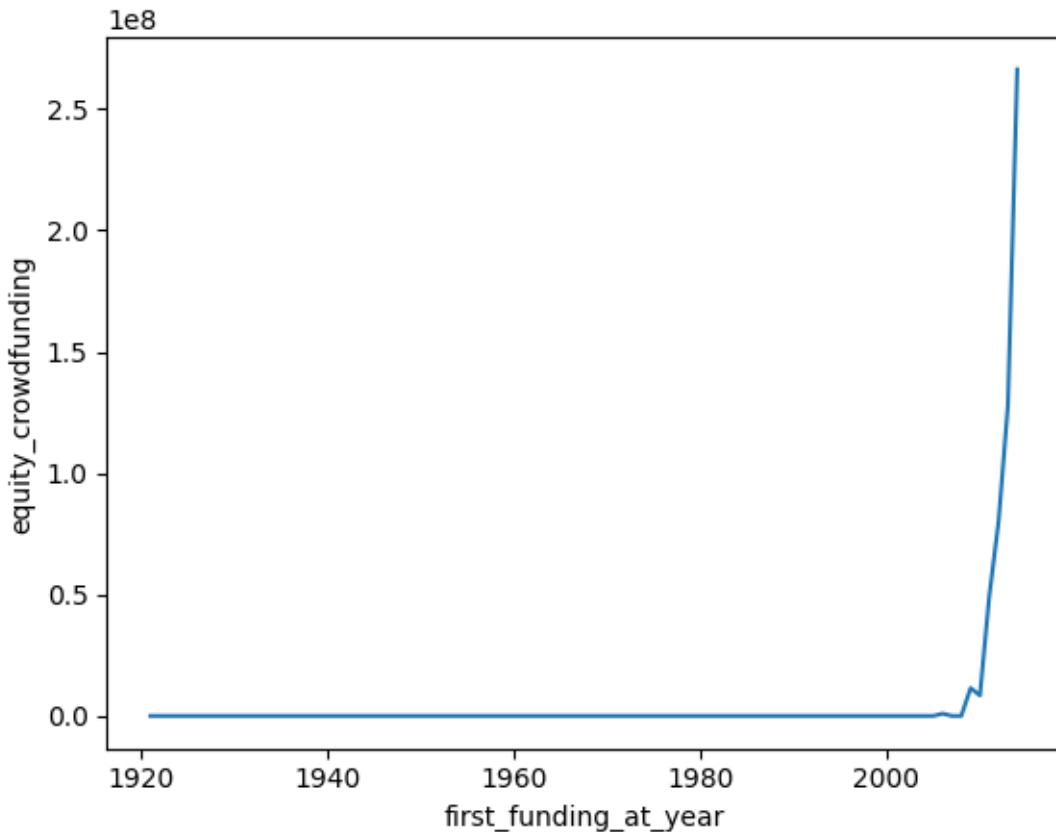
```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='equity_crowdfunding'>
```



Insights: From both plots it is evident that startups founded in the first quarter have attracted the most amount of crowd fundings

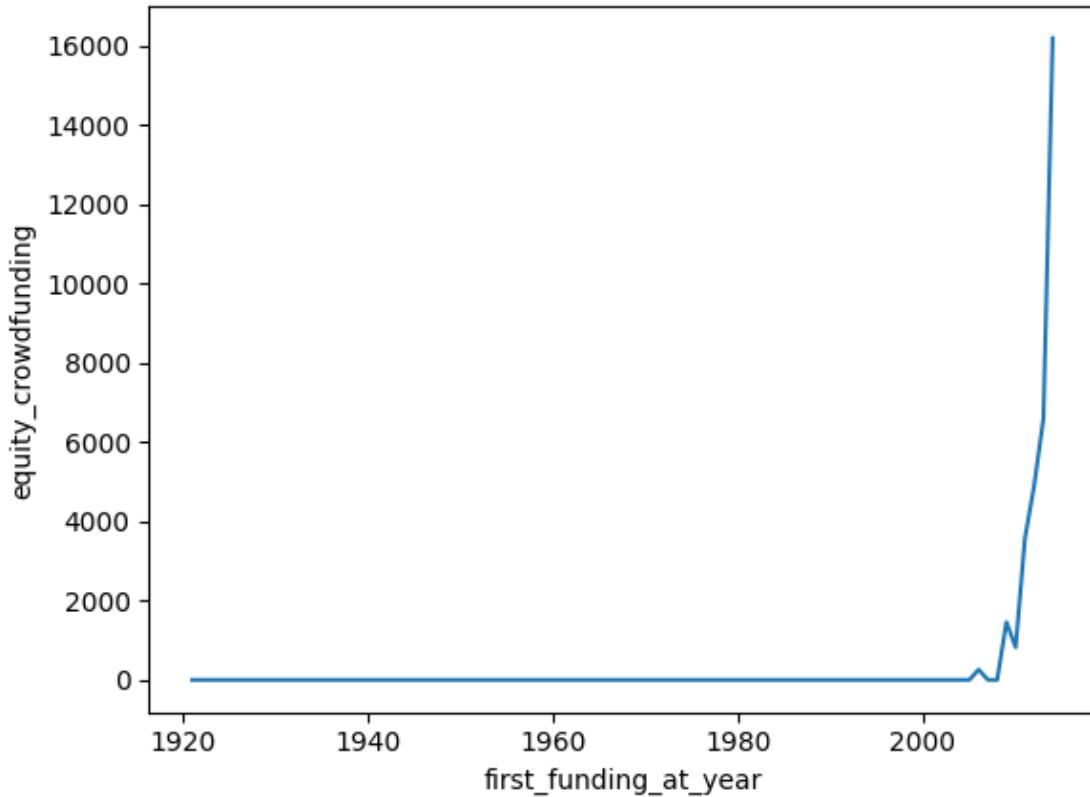
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({'equity_crowdfunding':  
    ↪'sum'}).reset_index().sort_values('equity_crowdfunding', ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot['equity_crowdfunding'],  
    ↪x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='equity_crowdfunding'>
```



```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({'equity_crowdfunding':
    ↴'mean'}).reset_index().sort_values('equity_crowdfunding', ascending=False)
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]
sns.lineplot(y=df_plot['equity_crowdfunding'], ↴
    ↴x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='equity_crowdfunding'>
```

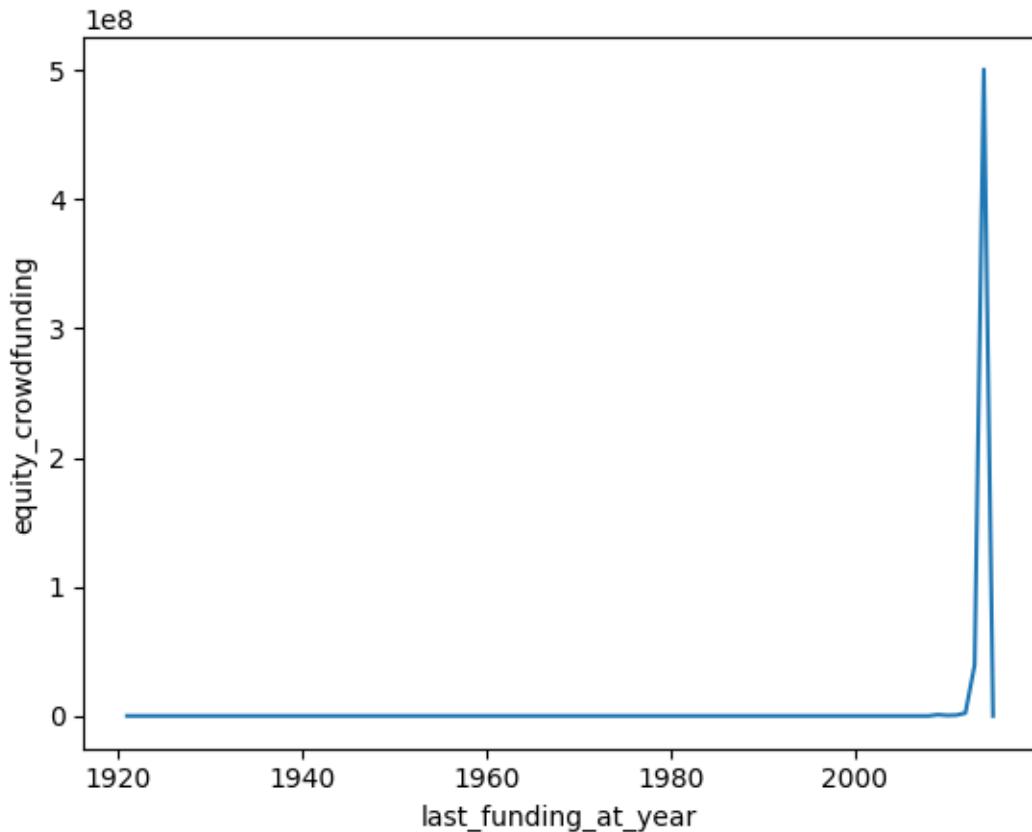


Insights: It can be seen from both plots that a lot of start ups received their first funding in the early 21st century indicating that 21st century being the age of start ups

Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({'equity_crowdfunding':  
    ↪ 'sum'}).reset_index().sort_values('equity_crowdfunding', ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot['equity_crowdfunding'],  
    ↪ x=df_plot['last_funding_at_year'])
```

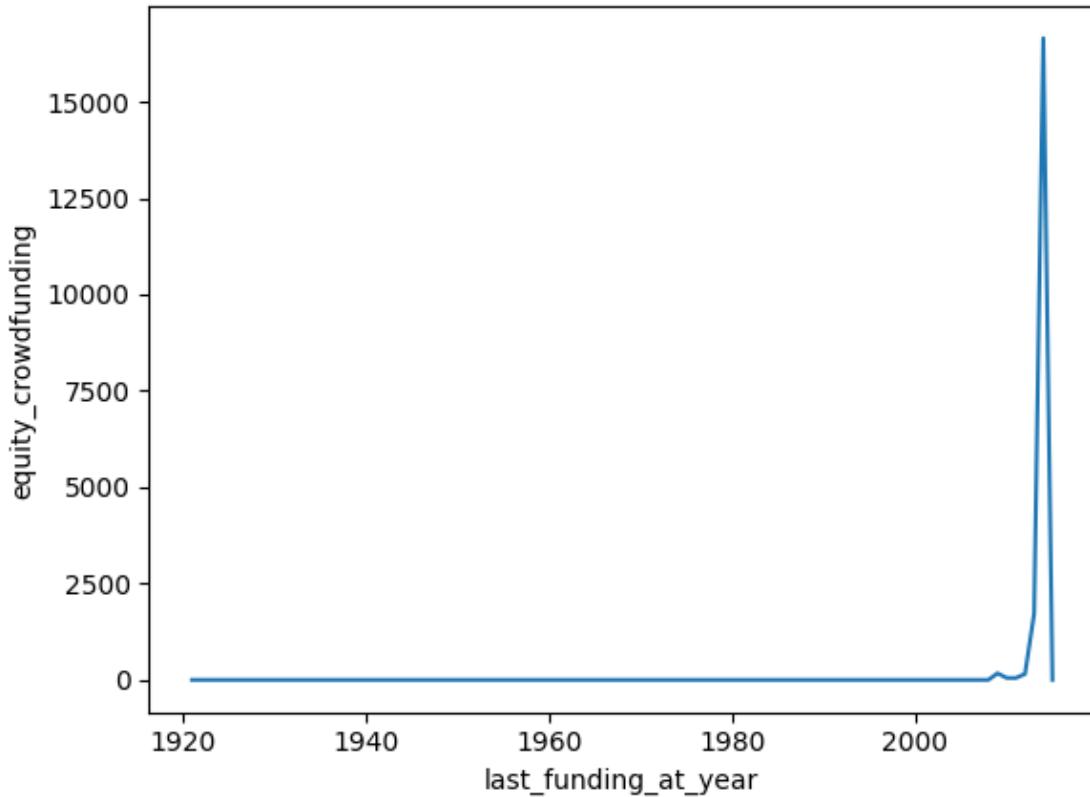
```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='equity_crowdfunding'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({'equity_crowdfunding':
    ↴'mean'}).reset_index().sort_values('equity_crowdfunding', ascending=False)
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]
sns.lineplot(y=df_plot['equity_crowdfunding'], ↴
    ↴x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='equity_crowdfunding'>
```



Insights: It can be seen from the plots that a lot of start-ups that received their last funding in the early 21st century attracted a large amount of crowd funding.

## 1.8 Undisclosed Funds

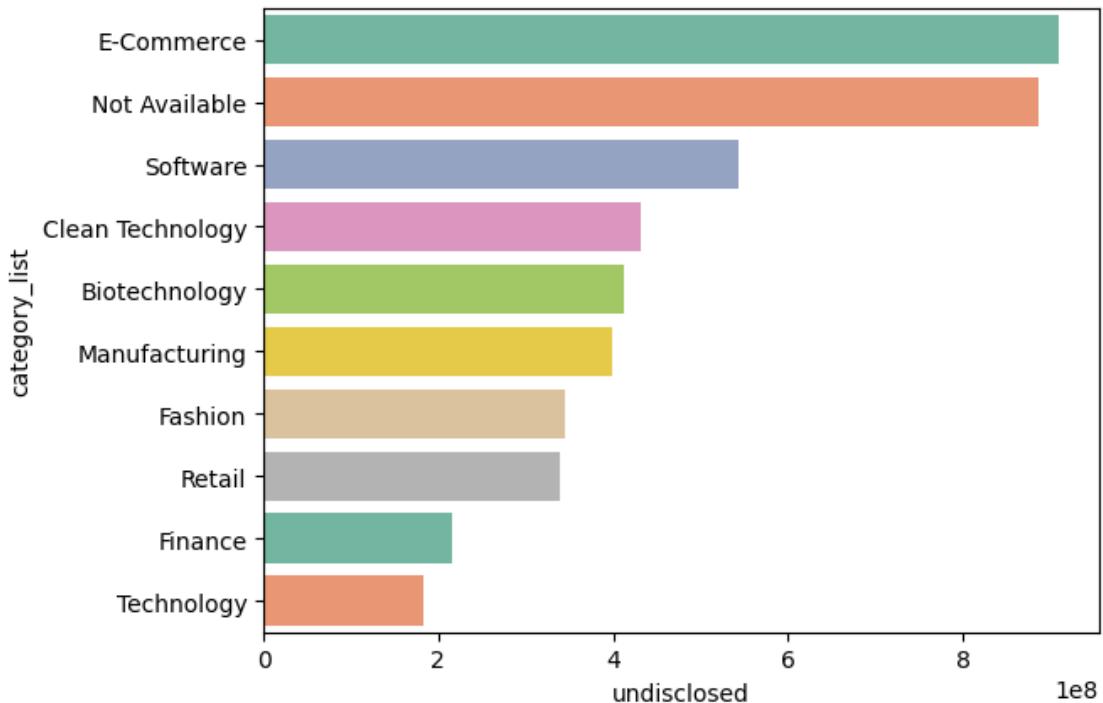
1. These are reserves that a company keeps but doesn't report on its balance sheet.
2. They can include money set aside for future investments or to cover liabilities

Average and Total Analysis of the Undisclosed Funds as shown below.

```
[ ]: column = 'undisclosed'

[ ]: df_plot = df_clean.groupby('category_list').agg({column: 'sum'}).reset_index().
    ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')

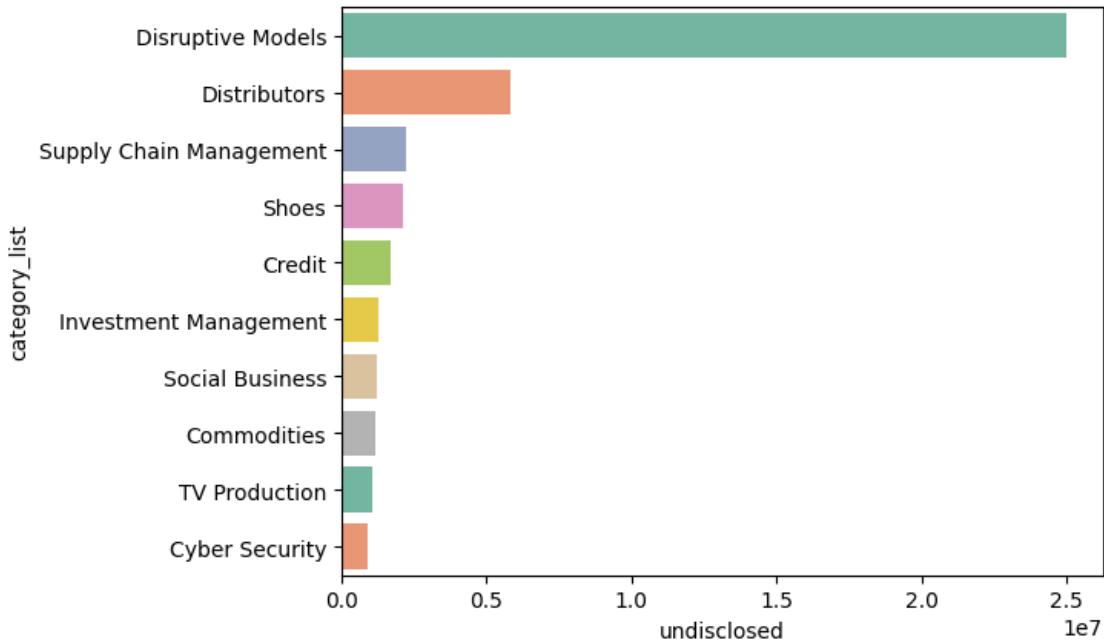
[ ]: <Axes: xlabel='undisclosed', ylabel='category_list'>
```



Insights: From the plot of top 10 categories ECommerce have the largest number of total undisclosed fundings.

```
[ ]: df_plot = df_clean.groupby('category_list').agg({column: 'mean'}).reset_index()
    .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')
```

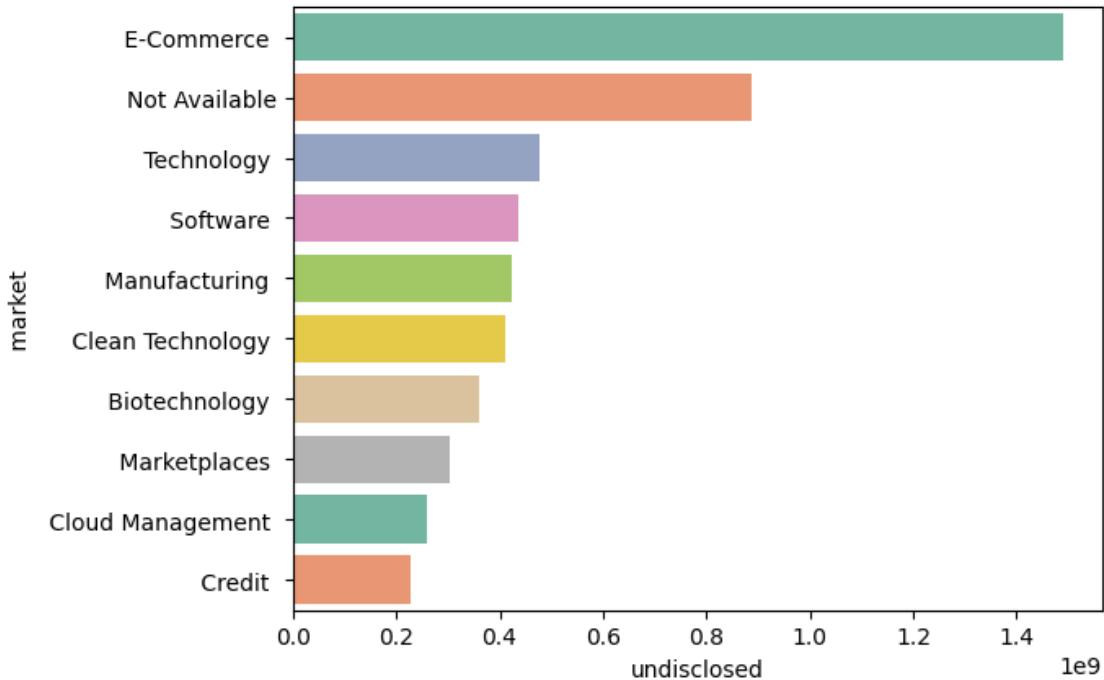
```
[ ]: <Axes: xlabel='undisclosed', ylabel='category_list'>
```



Insights: From the plot of top 10 categories Disruptive models have the largest number of average undisclosed fundings.

```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'sum'}).reset_index().
    ↪sort_values(column,ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot[' market '], palette='Set2')
```

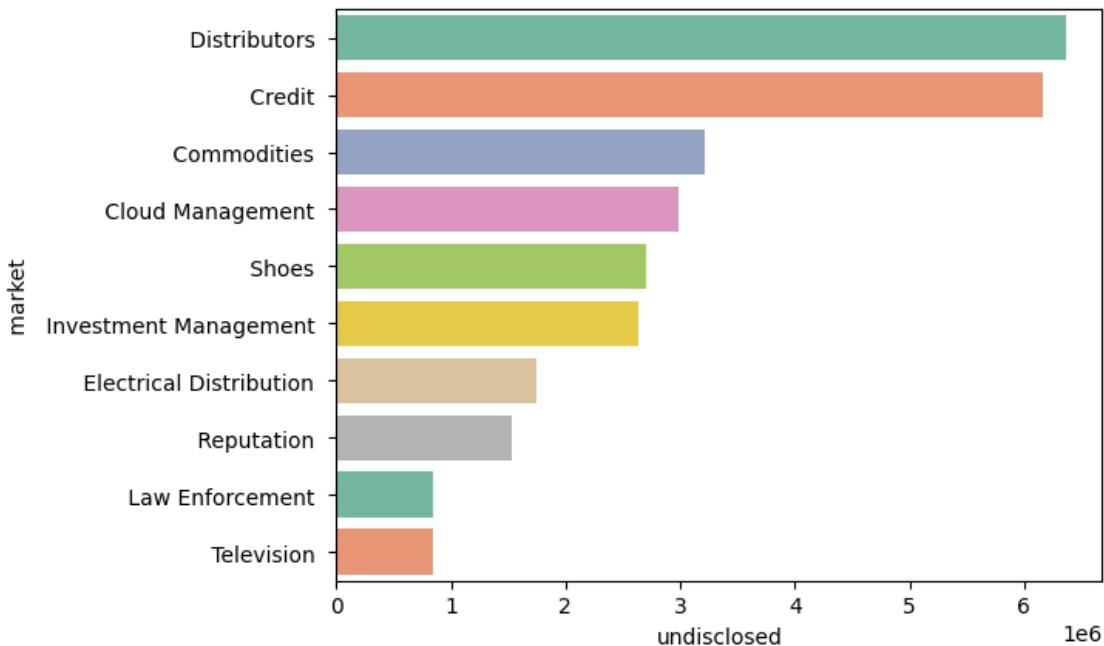
```
[ ]: <Axes: xlabel='undisclosed', ylabel=' market '>
```



Insights: From the plot of top 10 markets ECommerce have the largest number of total fundings.

```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'mean'}).reset_index()
    .sort_values(column,ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot[' market '], palette='Set2')
```

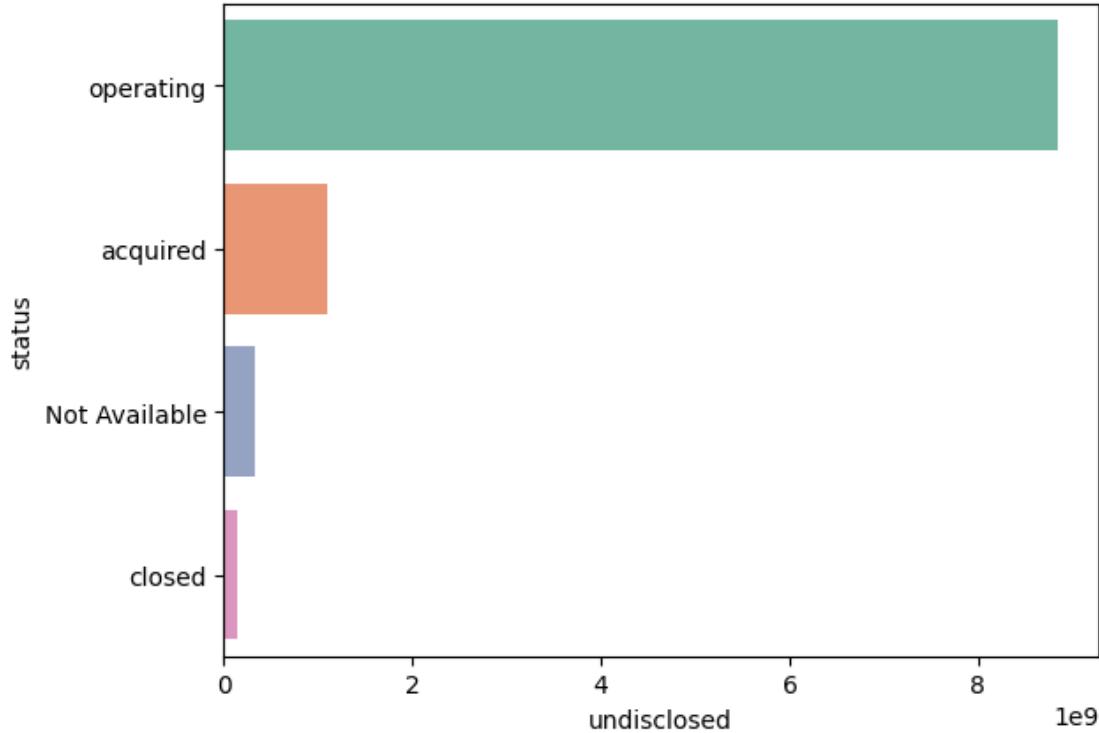
```
[ ]: <Axes: xlabel='undisclosed', ylabel=' market '>
```



Insights: From the plot of top 10 markets Distributors have the largest number of average undisclosed fundings.

```
[ ]: df_plot = df_clean.groupby('status').agg({column:'sum'}).reset_index().
    sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

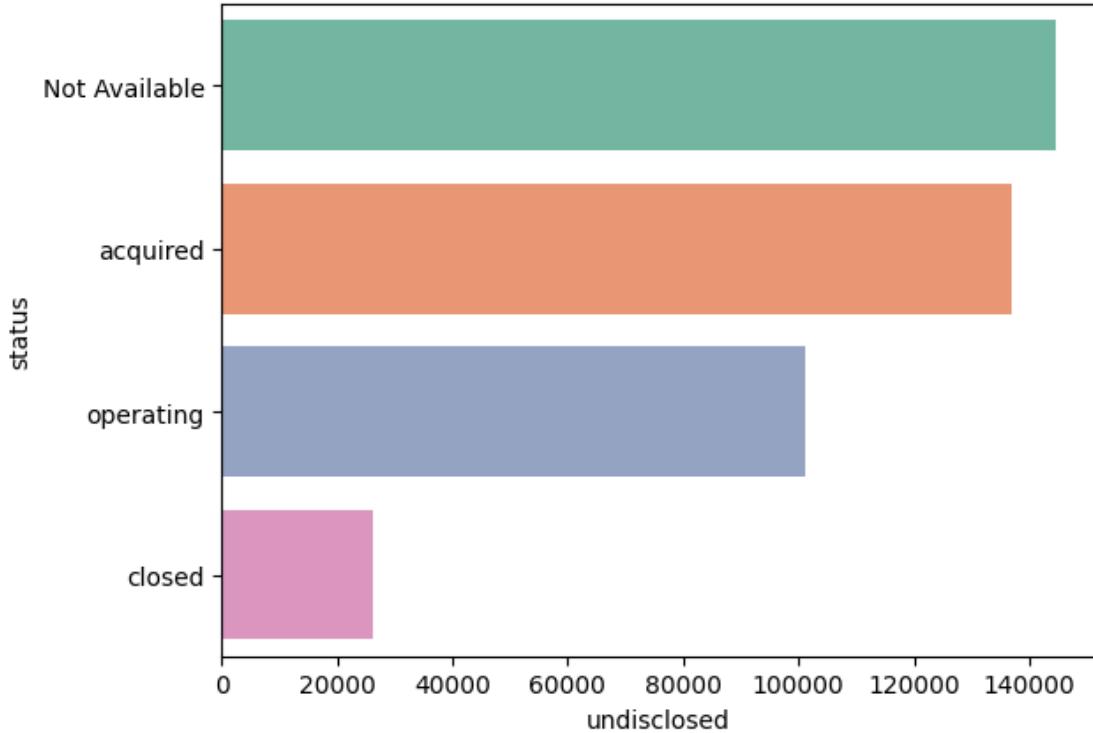
```
[ ]: <Axes: xlabel='undisclosed', ylabel='status'>
```



Insights: Startups that have an operating status have the largest amount of total undisclosed fundings.

```
[ ]: df_plot = df_clean.groupby('status').agg({column:'mean'}).reset_index()
    ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

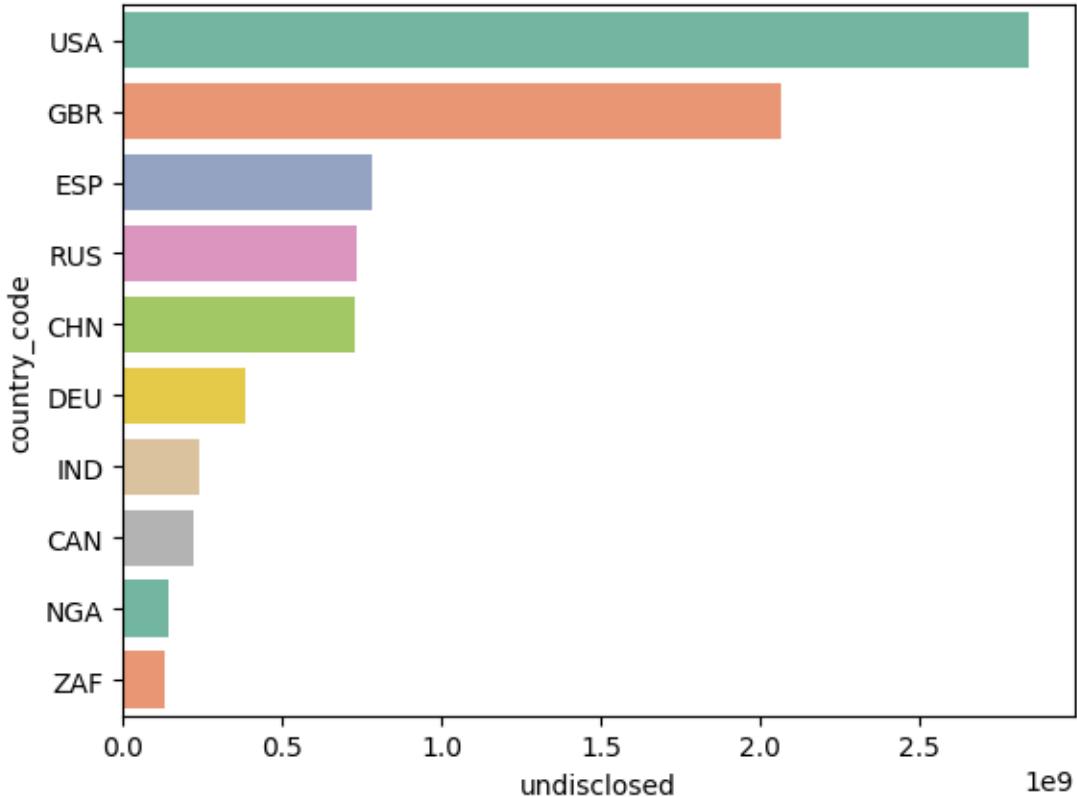
```
[ ]: <Axes: xlabel='undisclosed', ylabel='status'>
```



Insights: Startups that have an acquired status have the largest amount of average undisclosed fundings.

```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'sum'}).reset_index().sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['country_code']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')

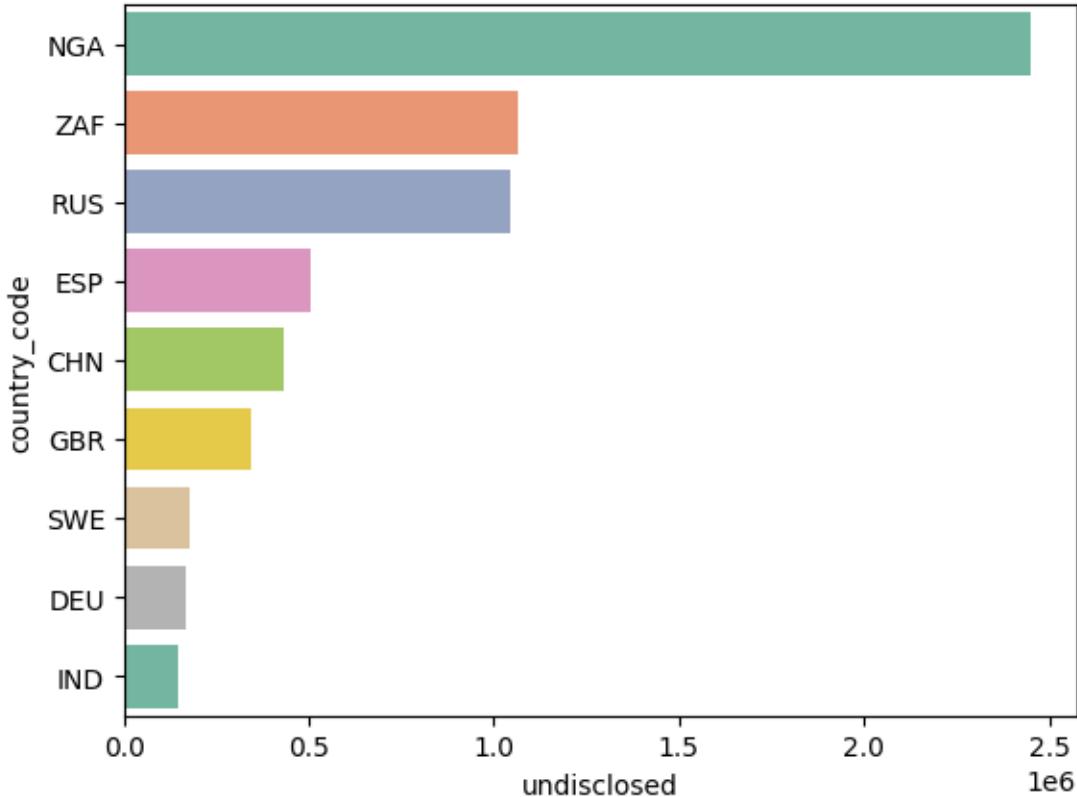
[ ]: <Axes: xlabel='undisclosed', ylabel='country_code'>
```



Insights: From the plot of top 10 countires USA have the largest number of total undisclosed fundings.

```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'mean'}).reset_index()
      ↪sort_values(column, ascending=False).head(10)
df_plot = df_plot[df_plot['country_code']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

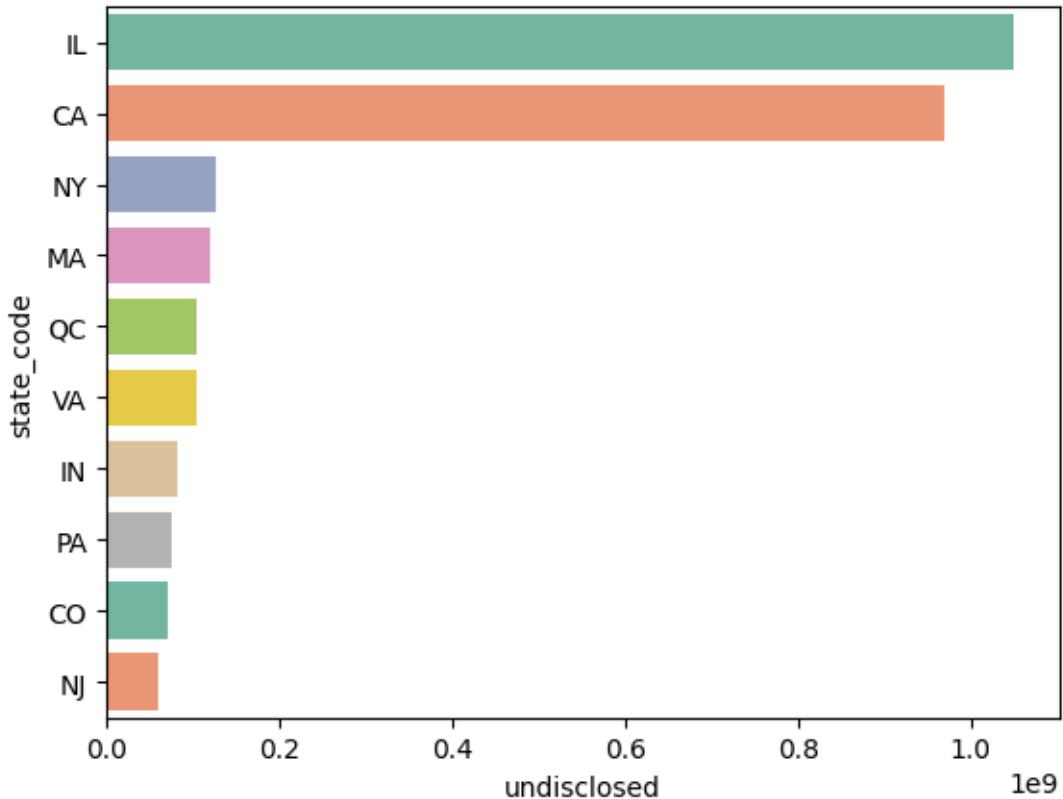
```
[ ]: <Axes: xlabel='undisclosed', ylabel='country_code'>
```



Insights: From the plot of top 10 countries Nigeria have the largest number of avergae undisclosed fundings.

```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'sum'}).reset_index()
      ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['state_code']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

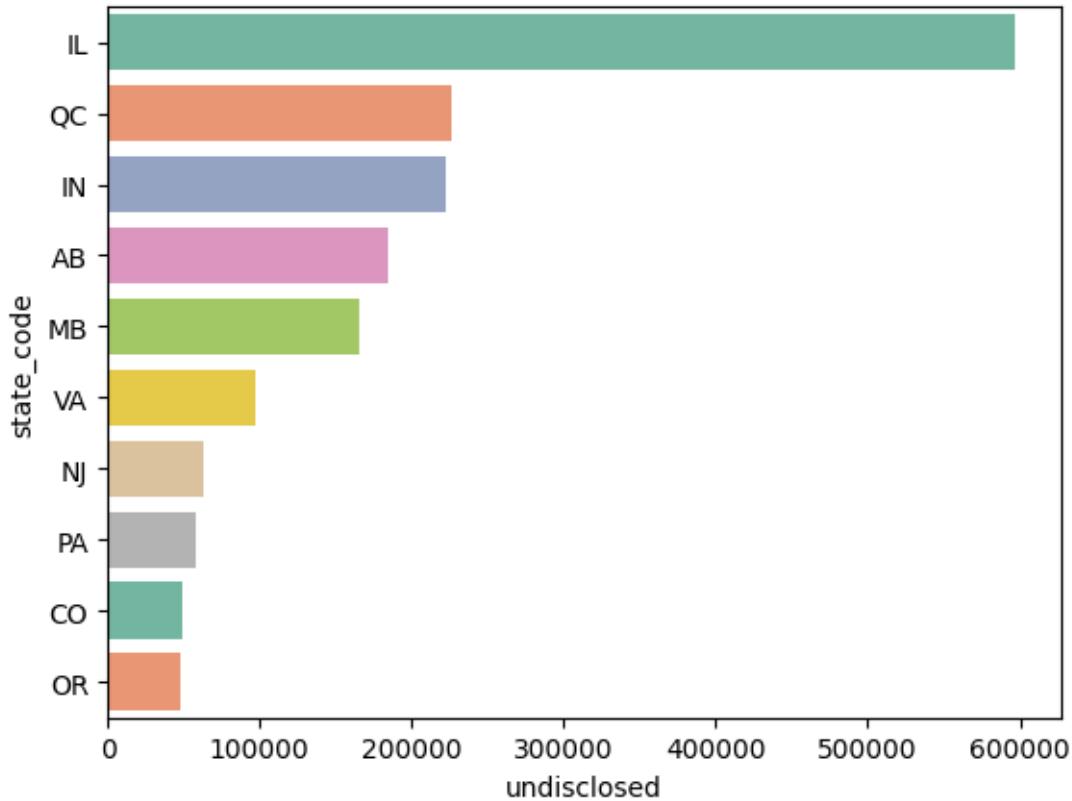
```
[ ]: <Axes: xlabel='undisclosed', ylabel='state_code'>
```



Insights: From the plot of top 10 states Illinois have the largest number of total undisclosed fundings.

```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'mean'}).reset_index()
    ↪sort_values(column,ascending=False).head(11)
df_plot = df_plot[df_plot['state_code']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

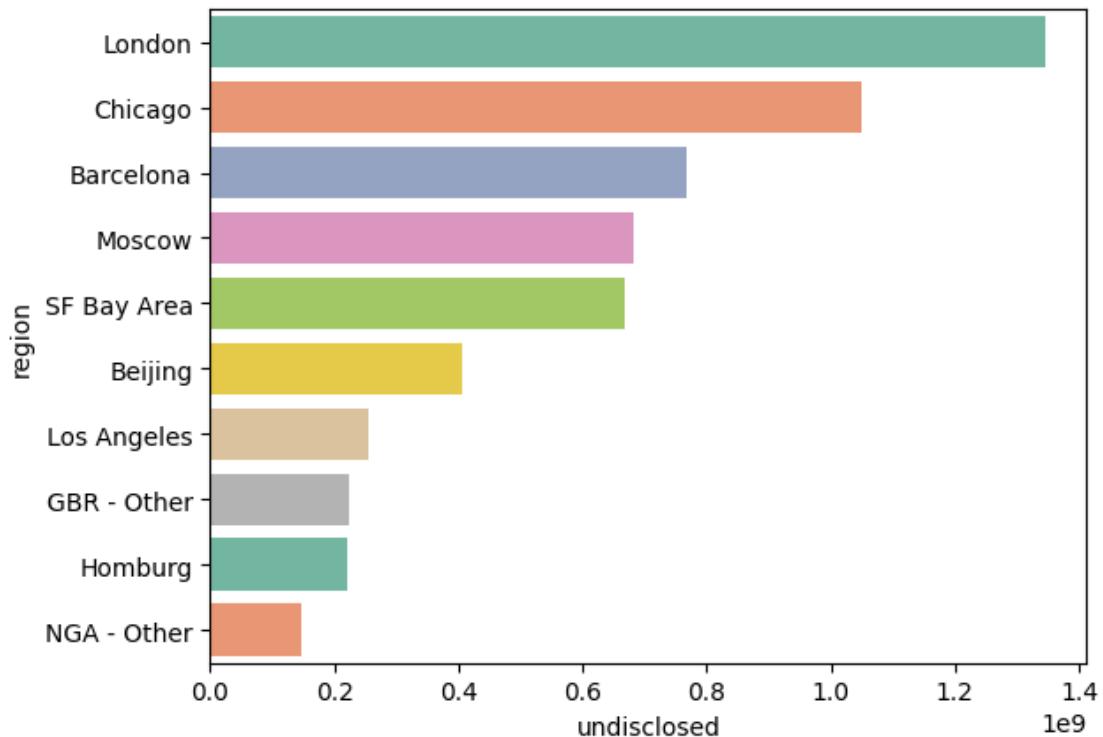
```
[ ]: <Axes: xlabel='undisclosed', ylabel='state_code'>
```



Insights: From the plot of top 10 states Illinois have the largest number of average undisclosed fundings.

```
[ ]: df_plot = df_clean.groupby('region').agg({column:'sum'}).reset_index().
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

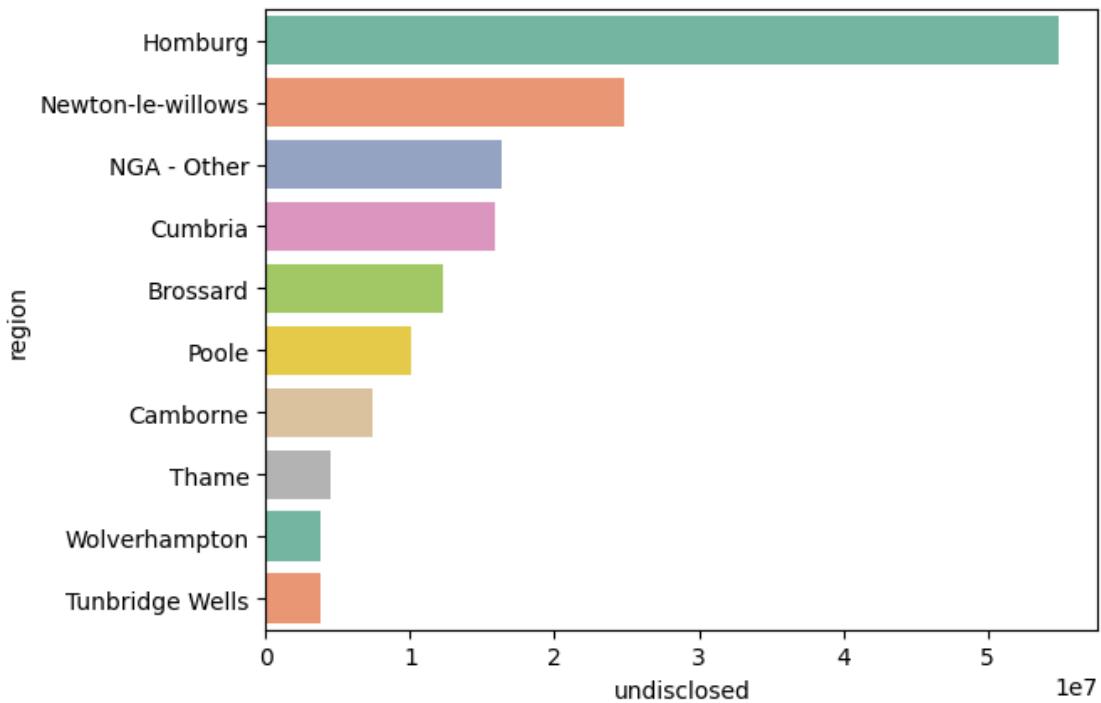
```
[ ]: <Axes: xlabel='undisclosed', ylabel='region'>
```



Insights: From the plot of top 10 cities London have the largest number of total undisclosed fundings.

```
[ ]: df_plot = df_clean.groupby('region').agg({column:'mean'}).reset_index()
      ↵sort_values(column, ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

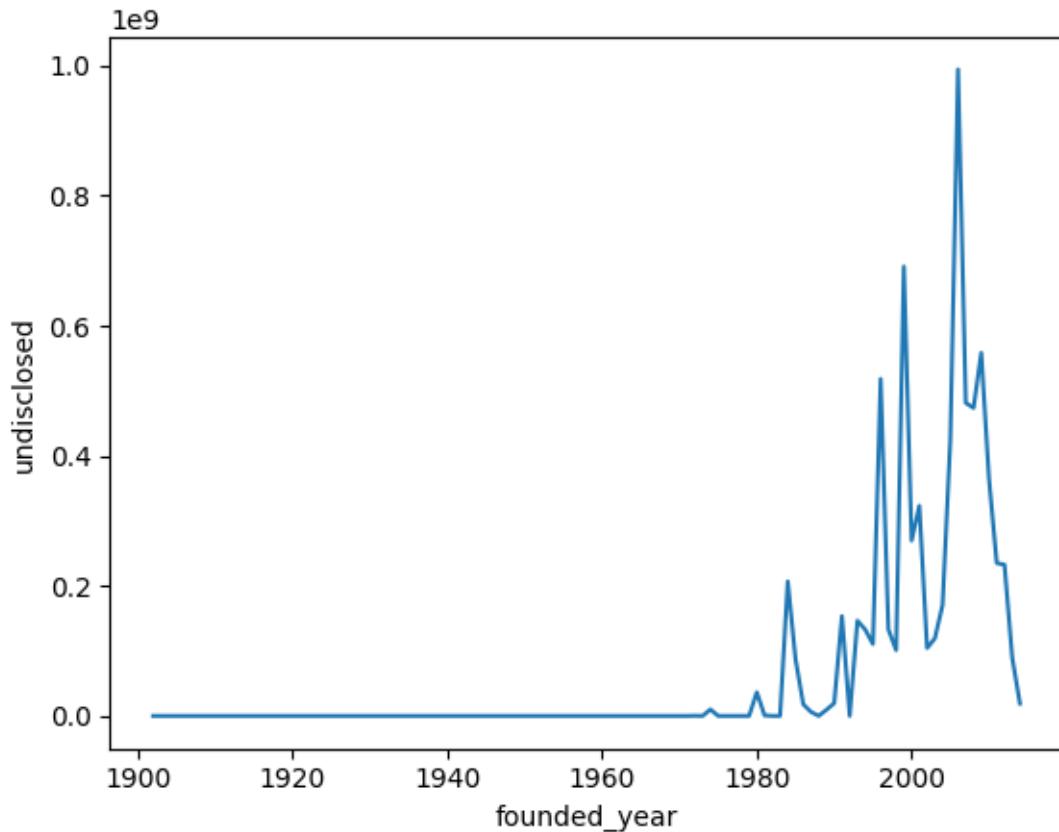
```
[ ]: <Axes: xlabel='undisclosed', ylabel='region'>
```



Insights: From the plot of top 10 cities Homburg have the largest number of avergae undisclosed fundings.

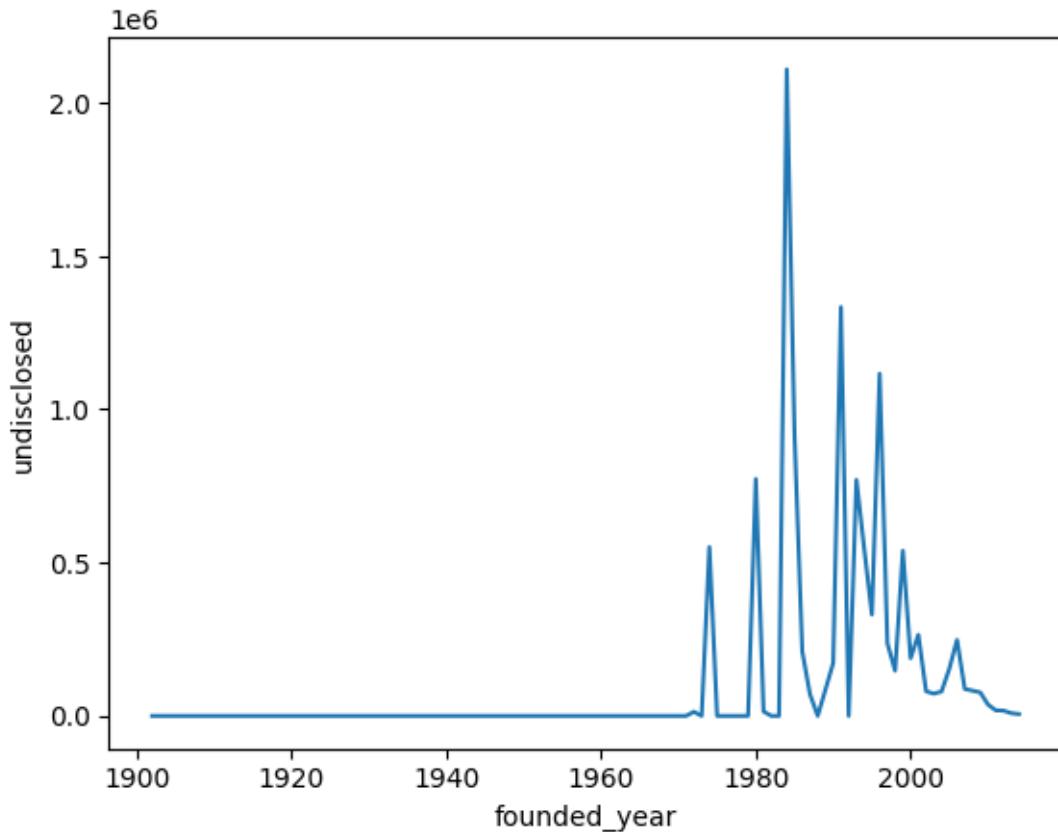
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'sum'}).reset_index()
      ↪sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='undisclosed'>
```



```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'mean'}).reset_index().  
      ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

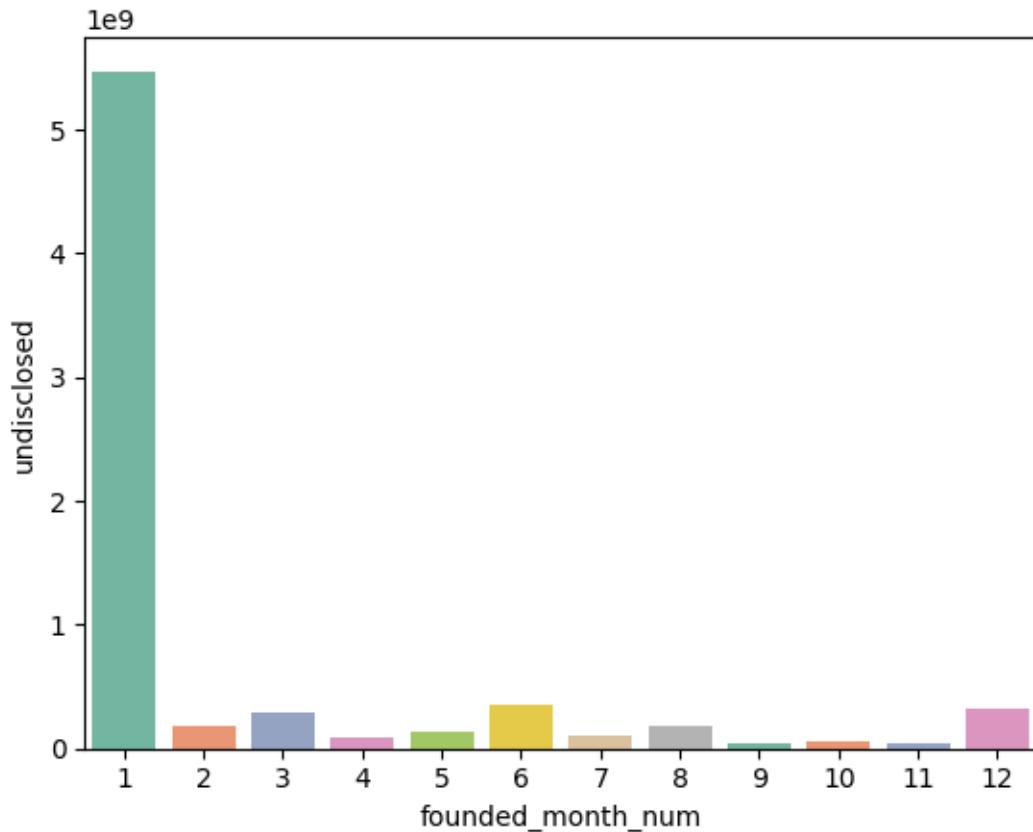
```
[ ]: <Axes: xlabel='founded_year', ylabel='undisclosed'>
```



Insights: It can be seen from the plots that a lot of start ups received their first fundings in the early 1980s attracted a large amount of undisclosed fundings.

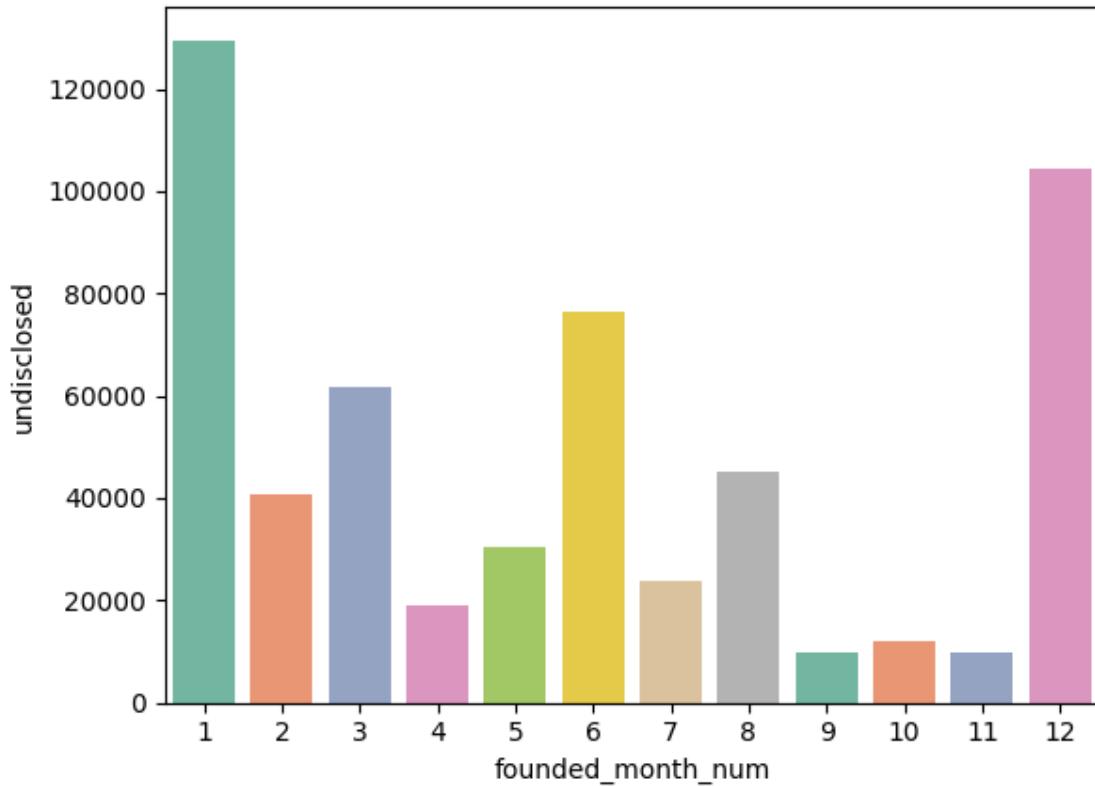
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_month_num'] > 0]  
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='undisclosed'>
```



```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

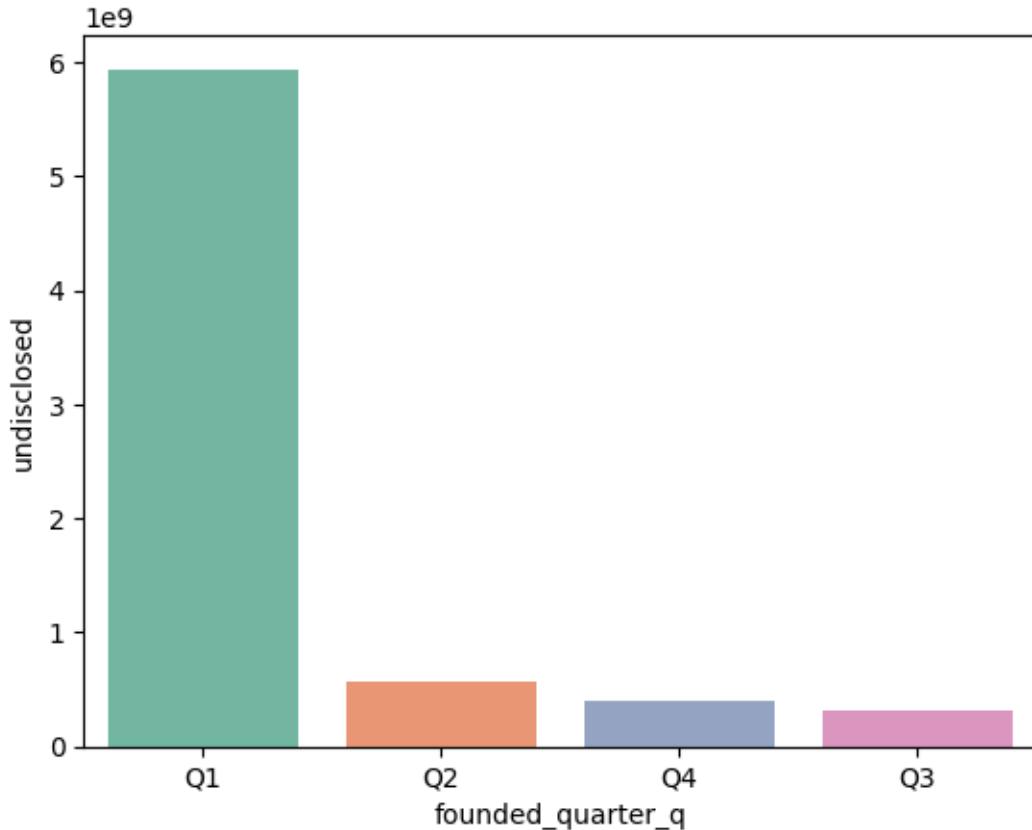
```
[ ]: <Axes: xlabel='founded_month_num', ylabel='undisclosed'>
```



Insights: From the above plot it can be seen that start ups founded in the month of January have attracted the most amount of undisclosed fundings

```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'sum'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q']!= 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

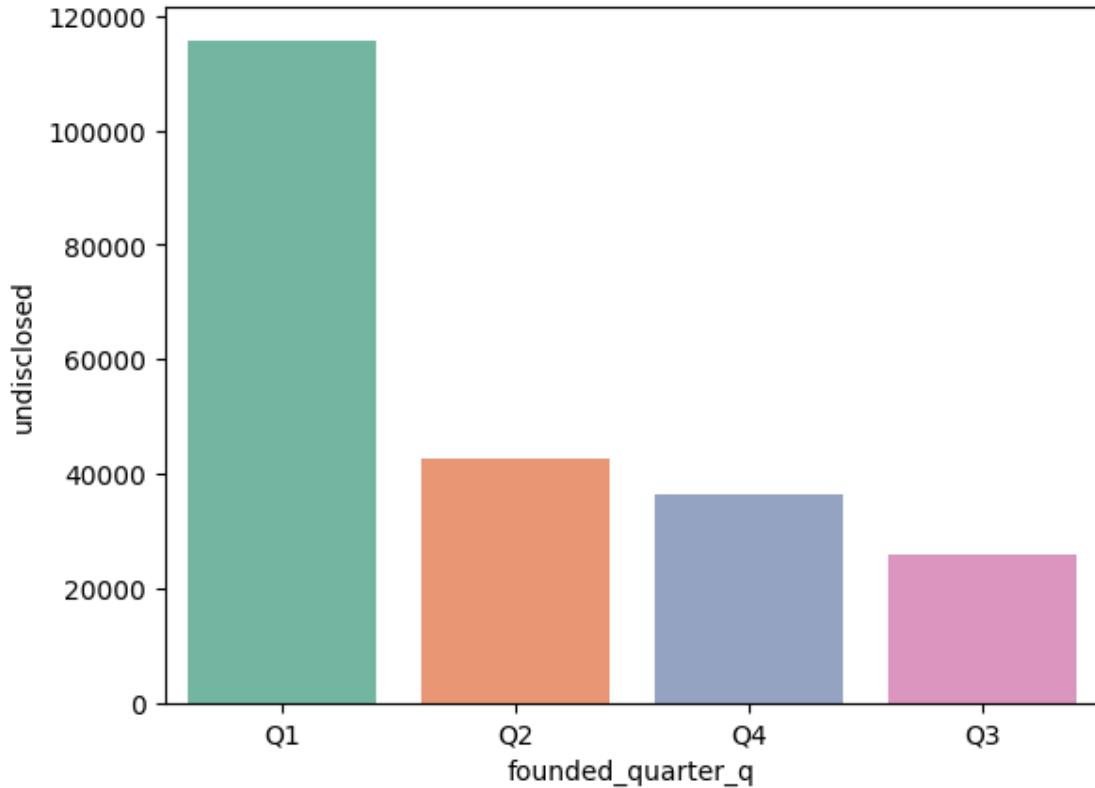
```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='undisclosed'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'mean'}).
      ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

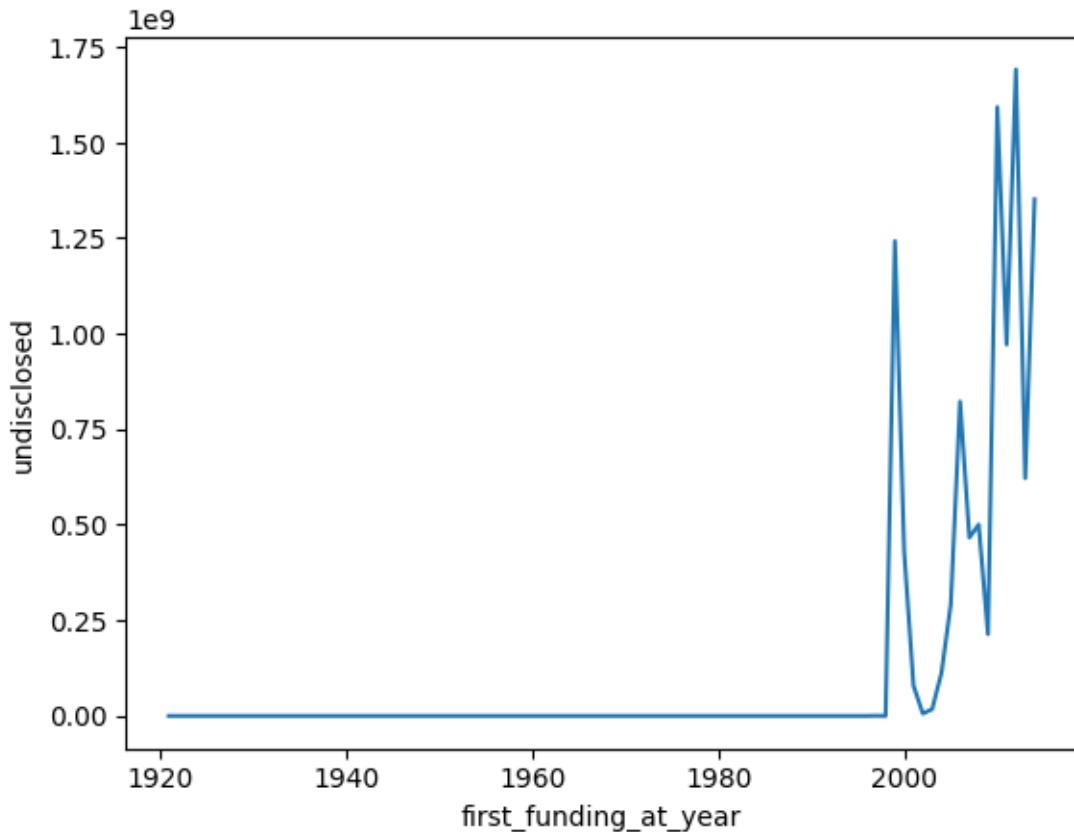
```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='undisclosed'>
```



Insights: From both plots it is evident that startups founded in the first quarter have attracted the most amount of undisclosed fundings

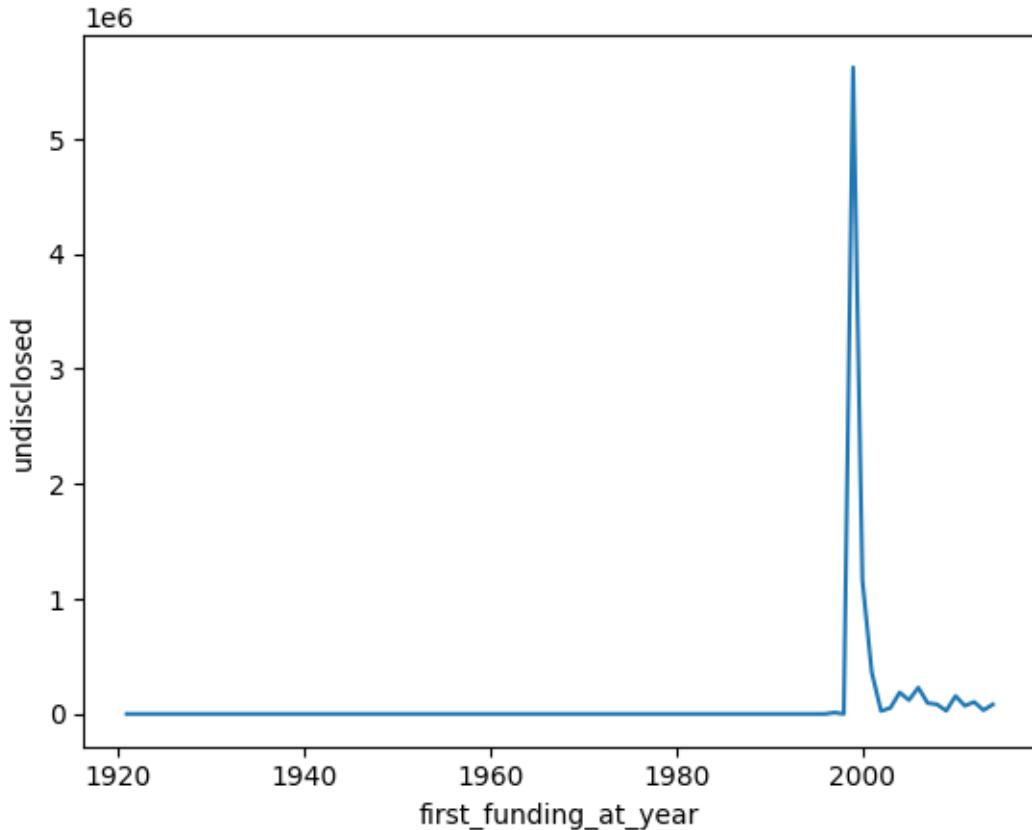
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'sum'}).
      ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='undisclosed'>
```



```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

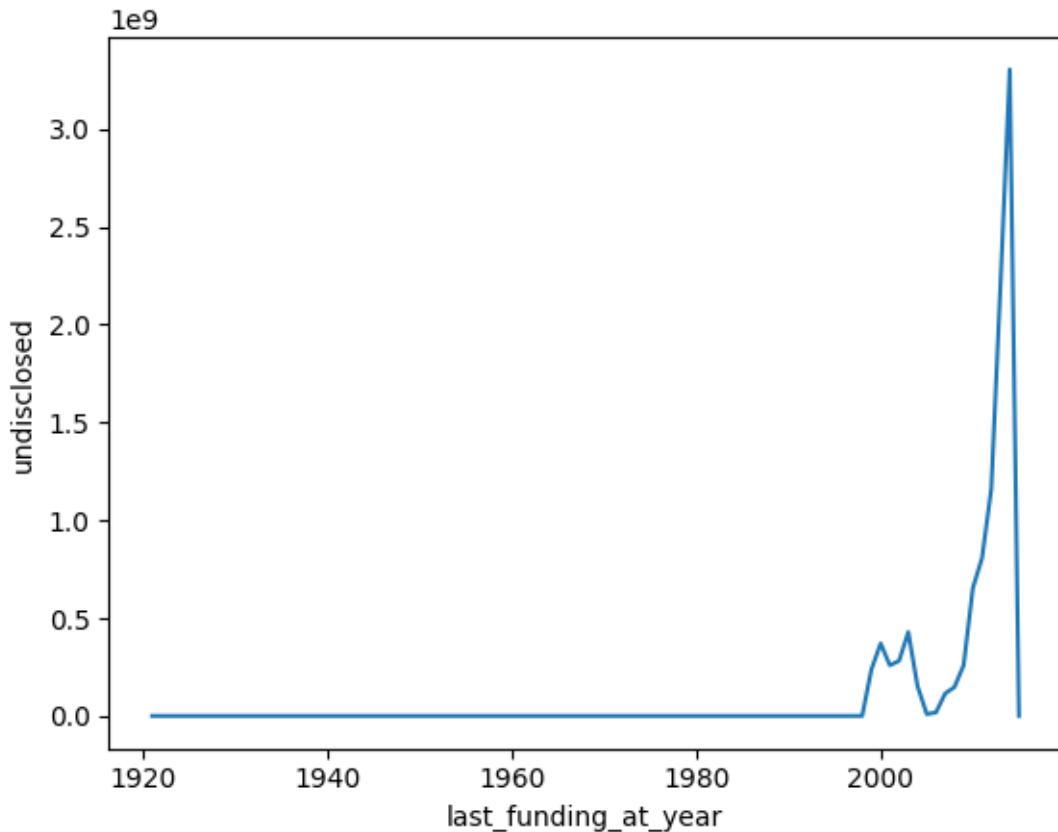
```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='undisclosed'>
```



Insights: From the above trend it can be seen that startups found in the 21st century received the largest amount of undisclosed fundings.

```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

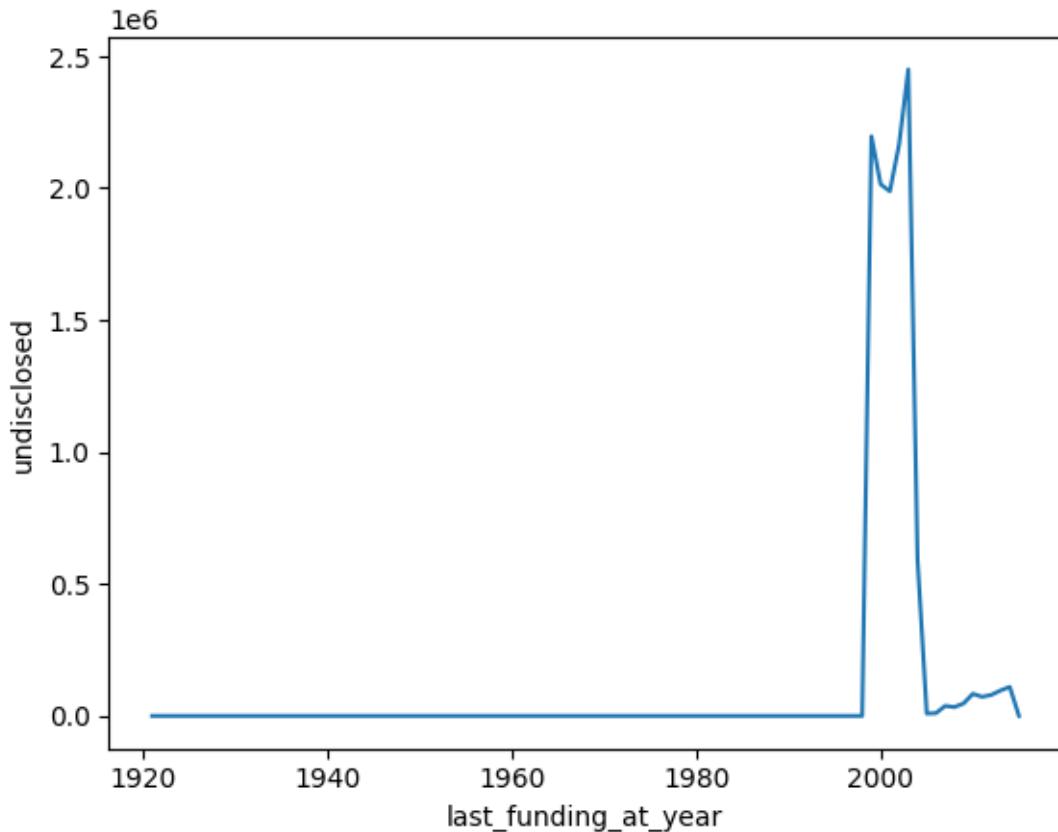
```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='undisclosed'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'mean'}).
      ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='undisclosed'>
```



Insights: It can be seen from the plots that a lot of startups that received their last funding in the early 21st century attracted a large amount of undisclosed funding.

## 1.9 Convertible Note Funds

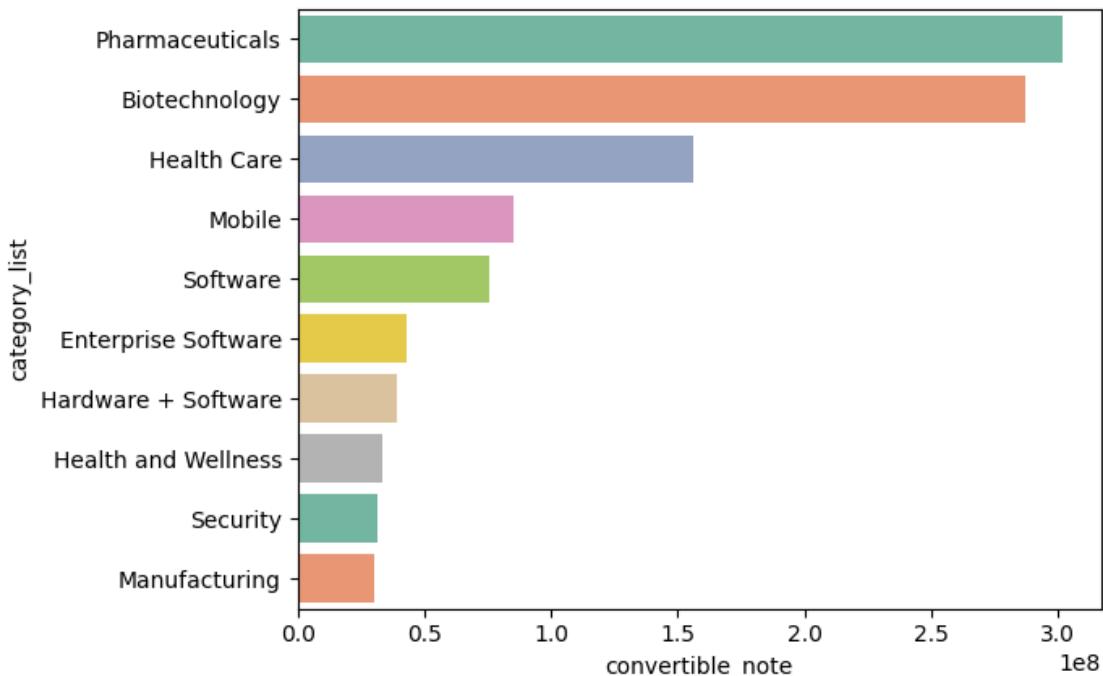
1. A convertible note refers to a short-term debt instrument (security) that can be converted into equity (ownership portion in a company).
2. Convertible notes are often used by seed investors who invest in startups.

Average and Total Analysis of the Convertible Note Funds as shown below.

```
[ ]: column = 'convertible_note'

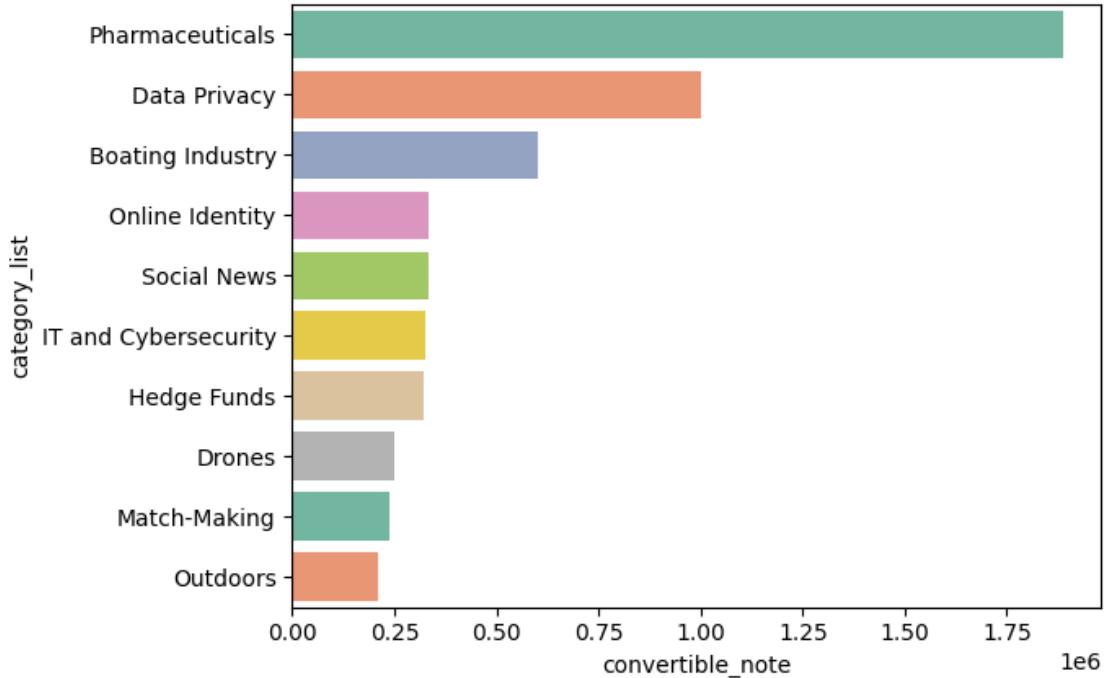
[ ]: df_plot = df_clean.groupby('category_list').agg({column: 'sum'}).reset_index() .
    .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')

[ ]: <Axes: xlabel='convertible_note', ylabel='category_list'>
```



```
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')
```

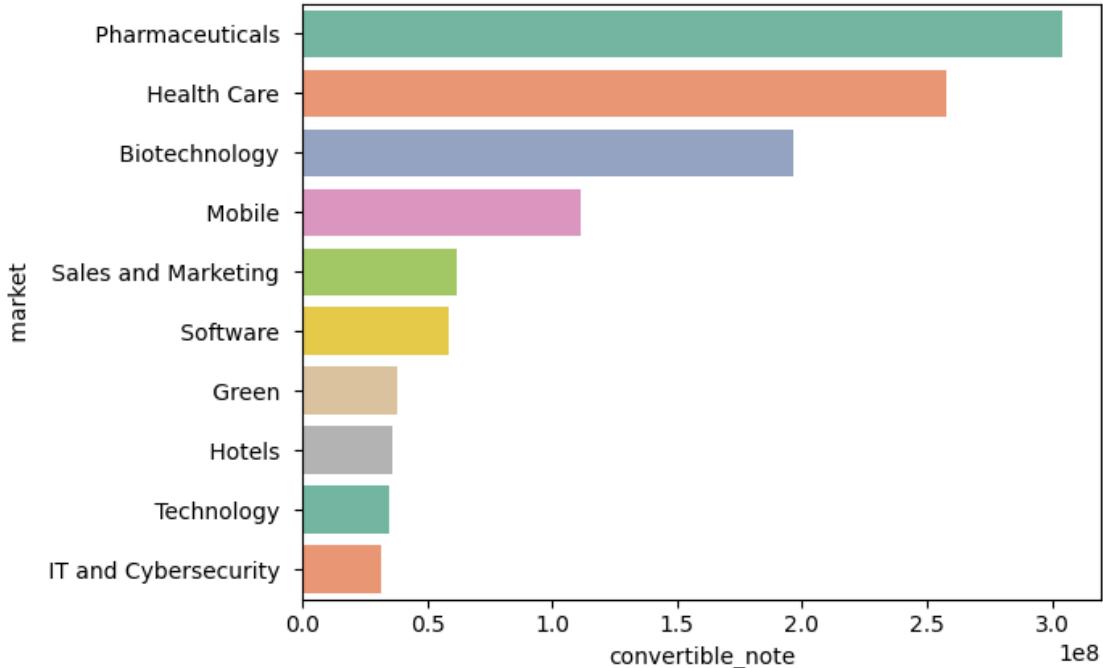
```
[ ]: <Axes: xlabel='convertible_note', ylabel='category_list'>
```



Insights: From the plot of top 10 categories Pharmaceuticals have the largest number of total and average convertible note fundings

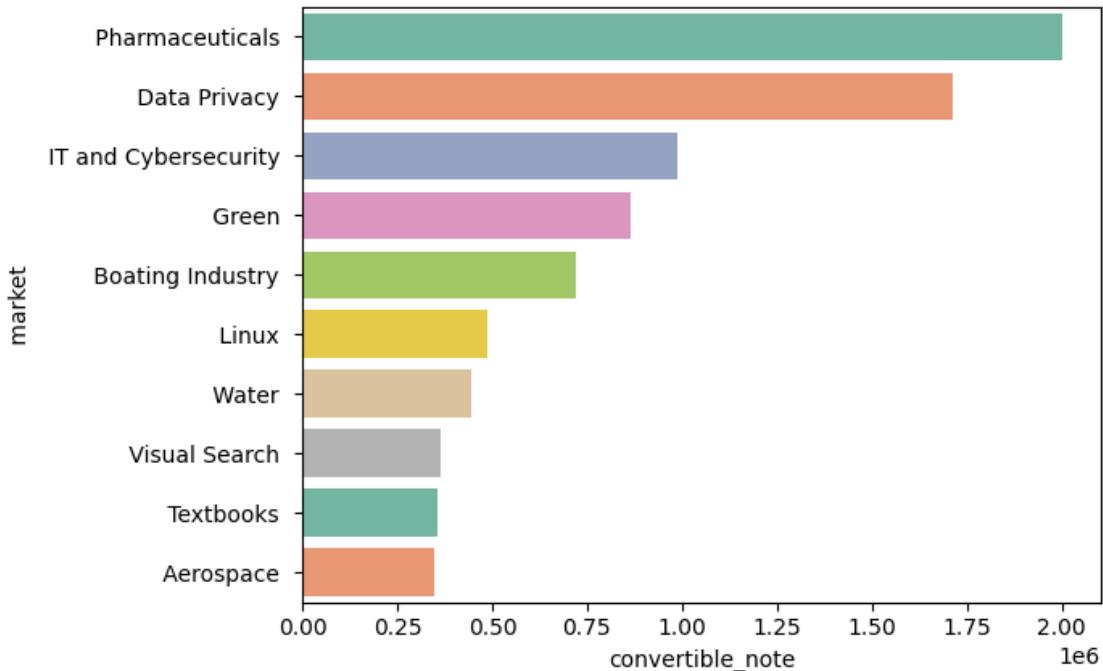
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'sum'}).reset_index()
      ↪sort_values(column,ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='convertible_note', ylabel=' market '>
```



```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'mean'}).reset_index().
    ↪sort_values(column,ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

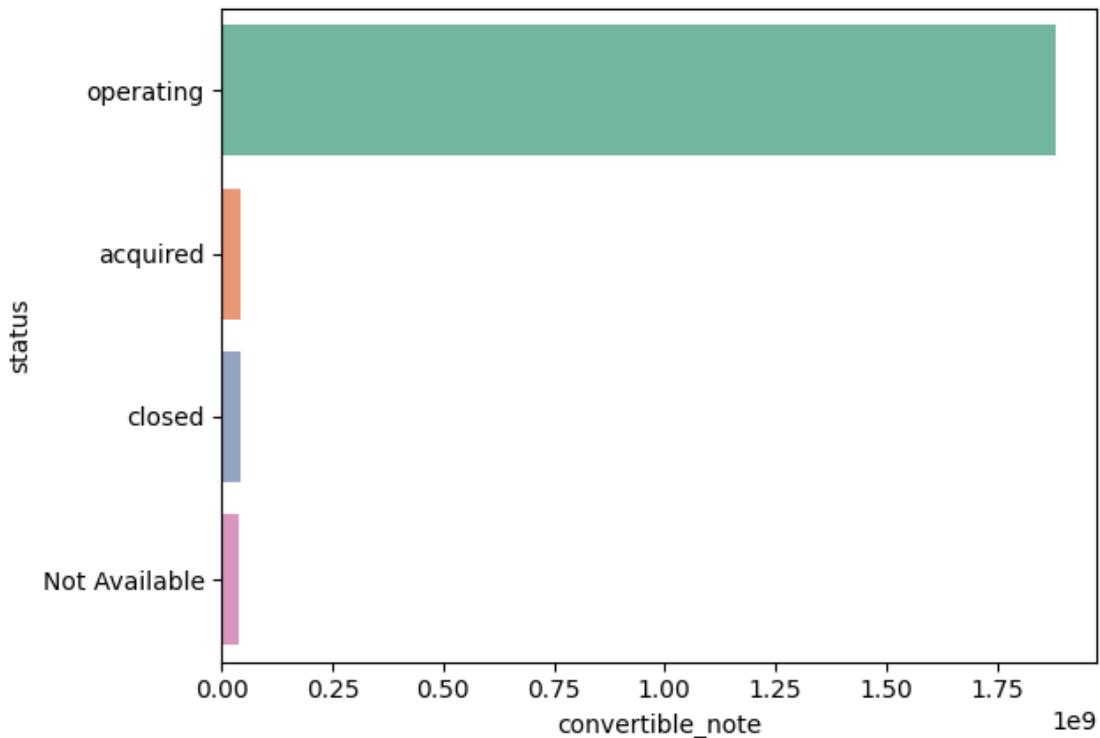
```
[ ]: <Axes: xlabel='convertible_note', ylabel=' market '>
```



Insights: From the plot of top 10 markets Pharmaceuticals have the largest number of total and average convertible note fundings

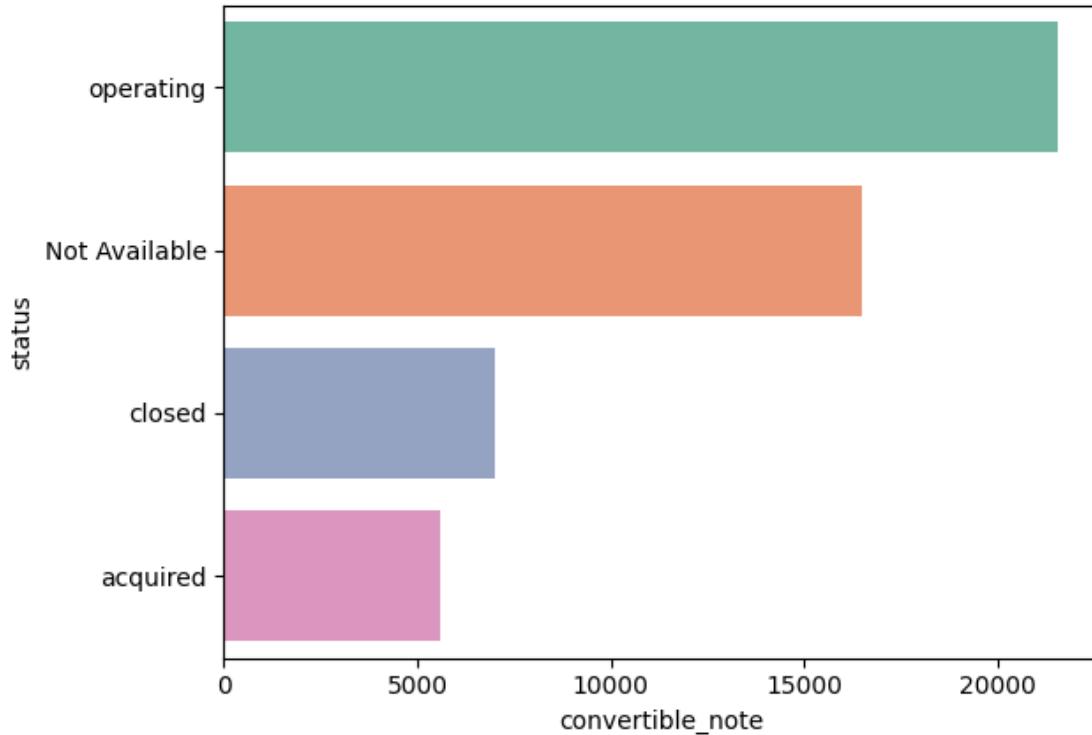
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'sum'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='convertible_note', ylabel='status'>
```



```
[ ]: df_plot = df_clean.groupby('status').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

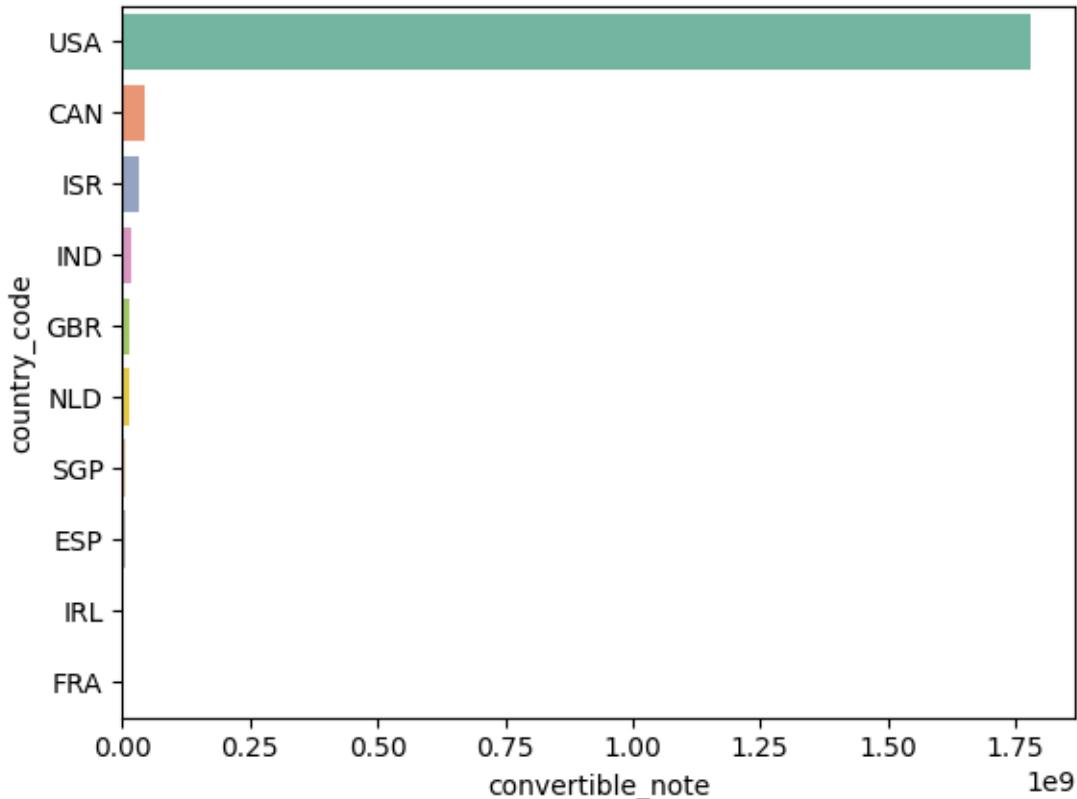
```
[ ]: <Axes: xlabel='convertible_note', ylabel='status'>
```



Insights: Startups that have an operating status have the largest amount of total convertible note fundings.

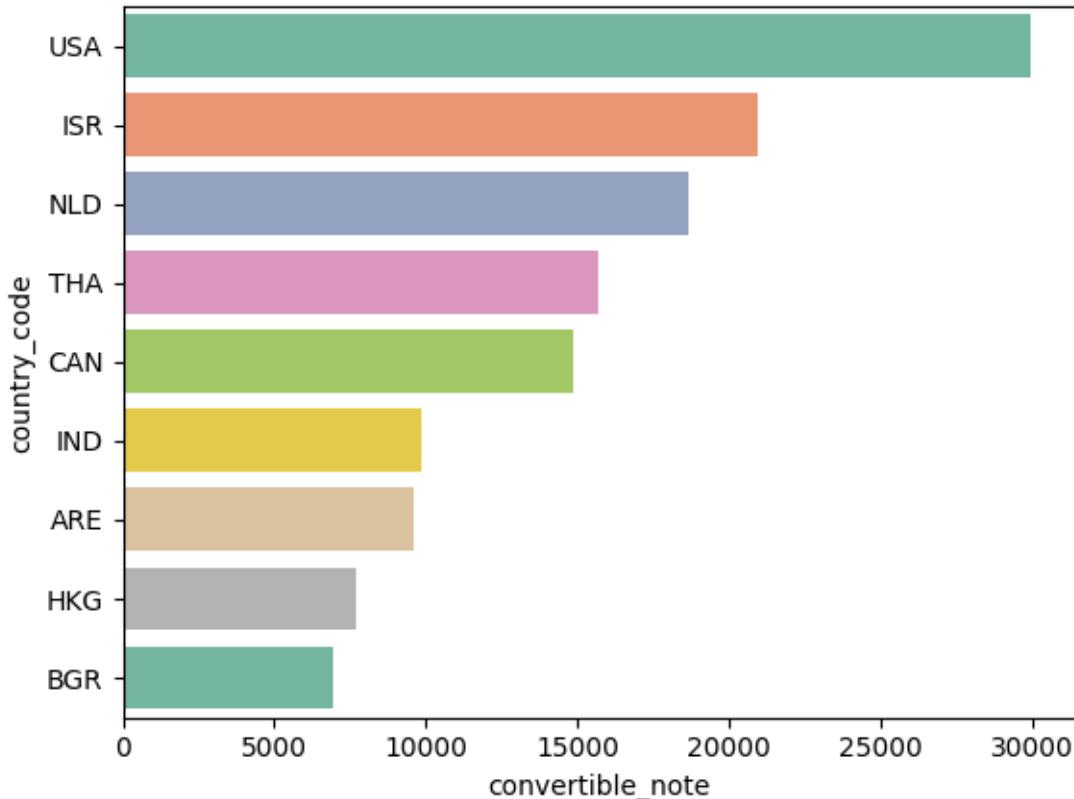
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['country_code']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='convertible_note', ylabel='country_code'>
```



```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

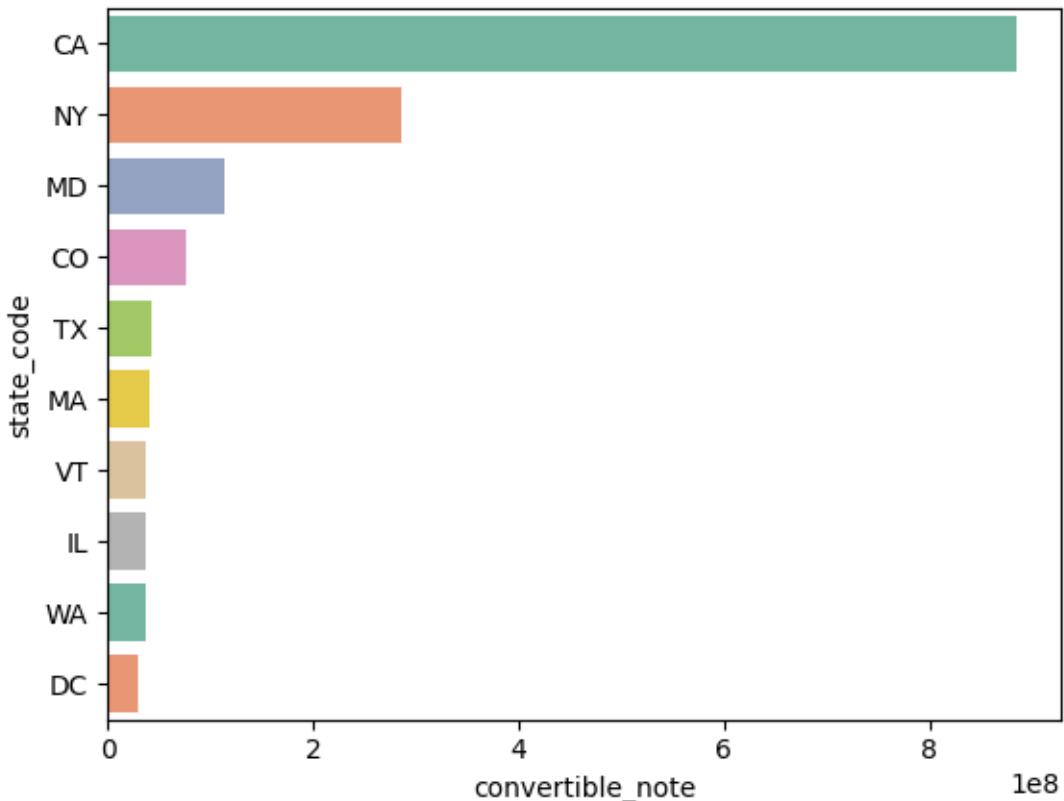
```
[ ]: <Axes: xlabel='convertible_note', ylabel='country_code'>
```



Insights: From the plot of top 10 countries USA have the largest number of total and average convertible note fundings.

```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'sum'}).reset_index()
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['state_code']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

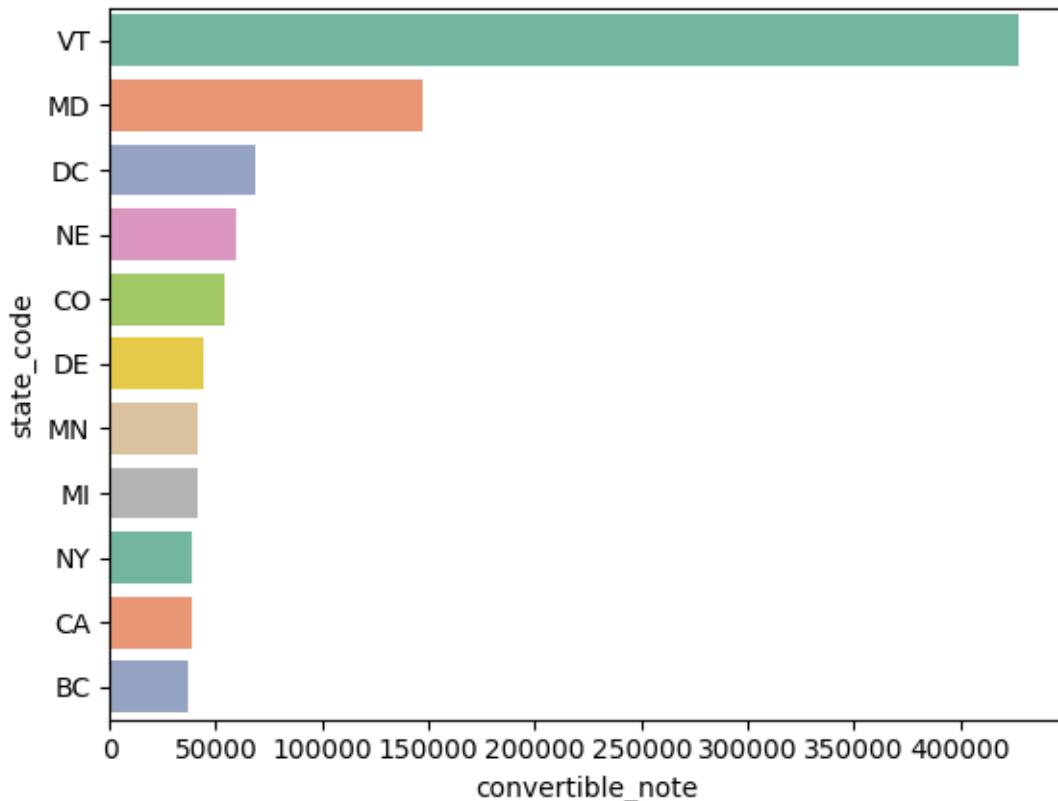
```
[ ]: <Axes: xlabel='convertible_note', ylabel='state_code'>
```



Insights: From the plot of top 10 states California have the largest number of total convertible fundings.

```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'mean'}).reset_index().sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['state_code']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

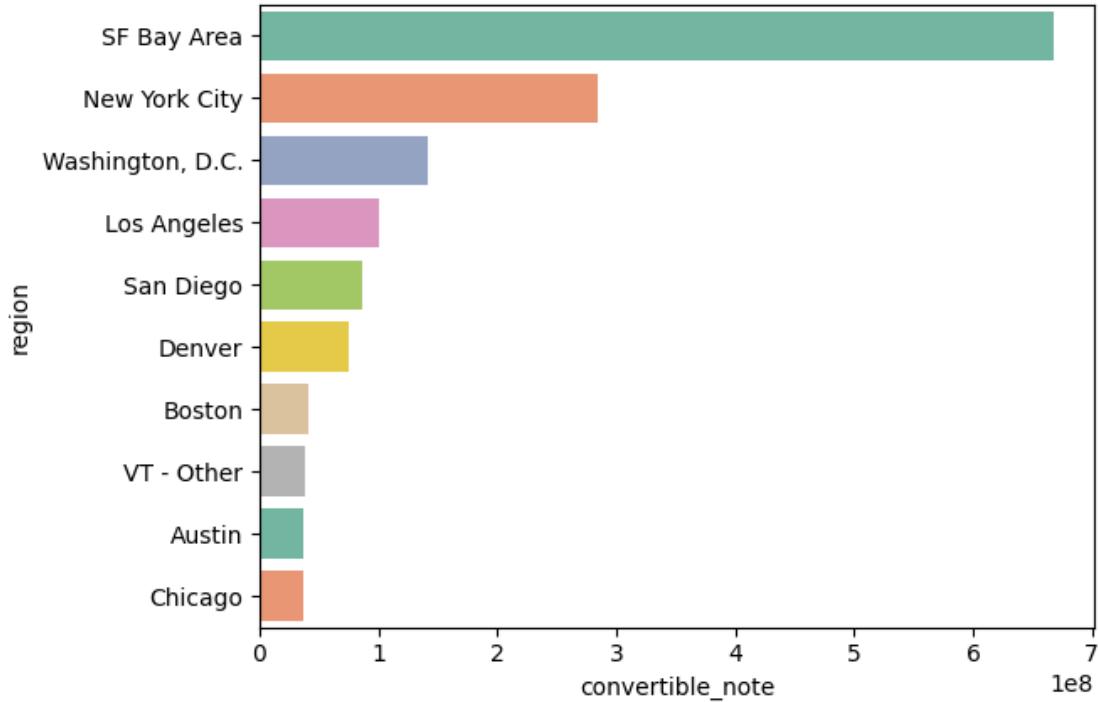
```
[ ]: <Axes: xlabel='convertible_note', ylabel='state_code'>
```



Insights: From the plot of top 10 states Vermont have the largest number of average convertible note fundings.

```
[ ]: df_plot = df_clean.groupby('region').agg({column:'sum'}).reset_index().
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

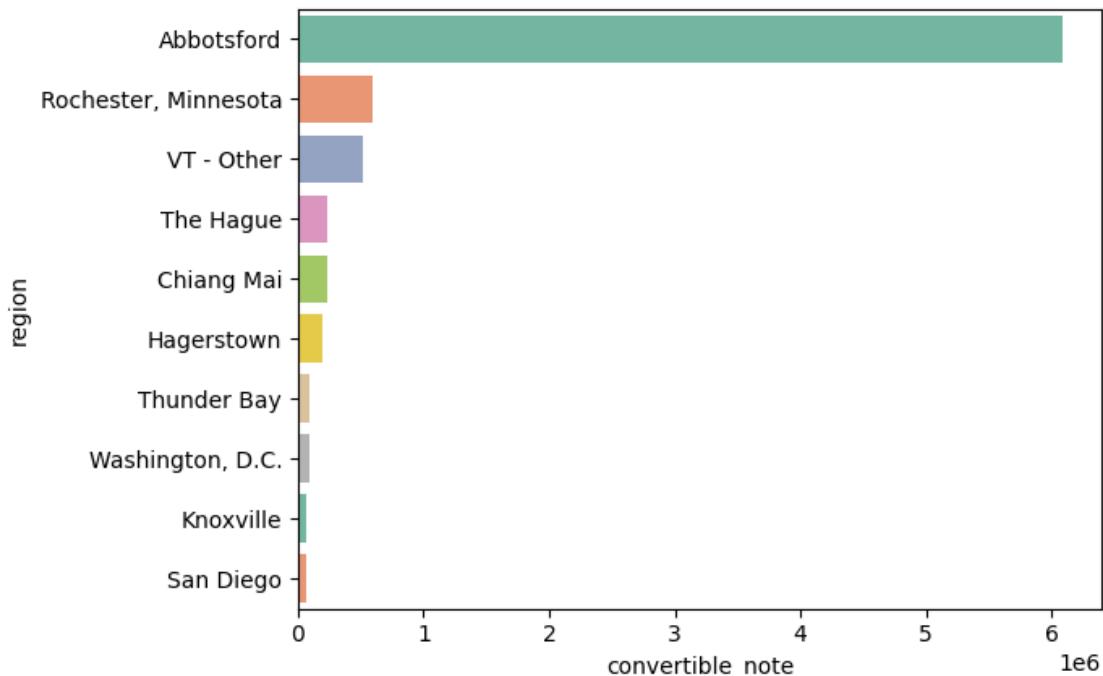
```
[ ]: <Axes: xlabel='convertible_note', ylabel='region'>
```



Insights: From the plot of top 10 cities SF Bay Area have the largest number of total convertible note fundings.

```
[ ]: df_plot = df_clean.groupby('region').agg({column:'mean'}).reset_index()
      ↪sort_values(column, ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

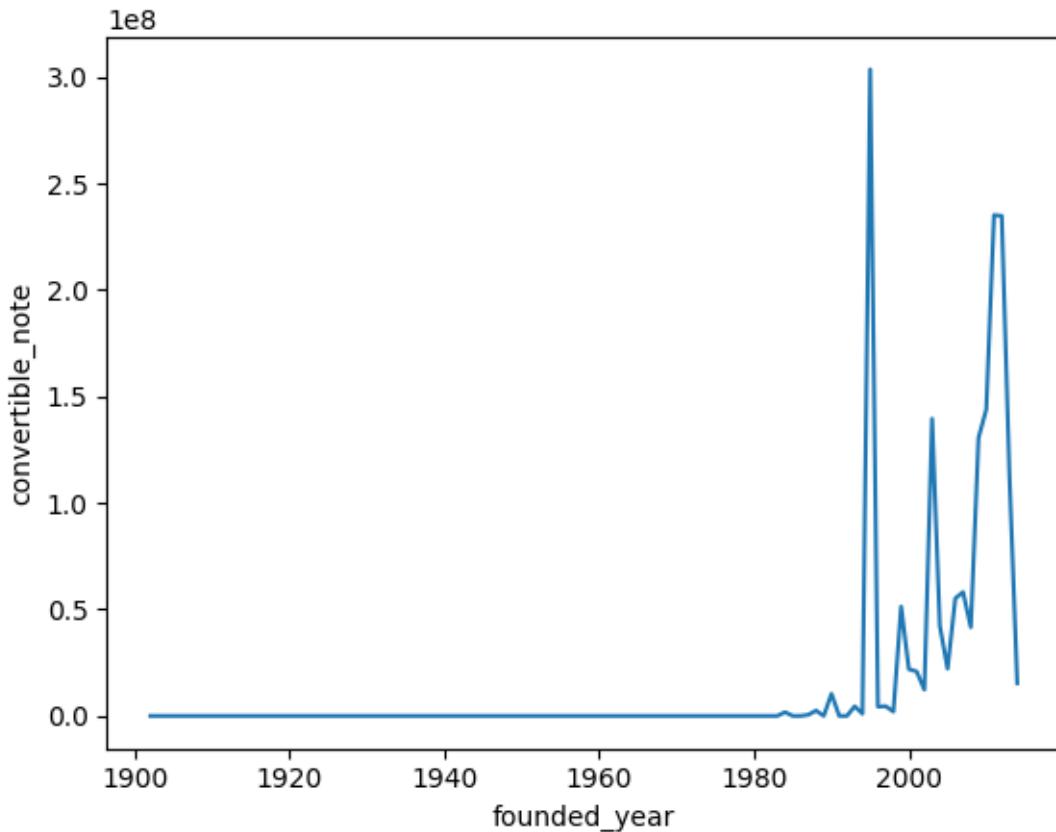
```
[ ]: <Axes: xlabel='convertible_note', ylabel='region'>
```



Insights: From the plot of top 10 cities Abbostoford have the largest number of avergae convertible fundings.

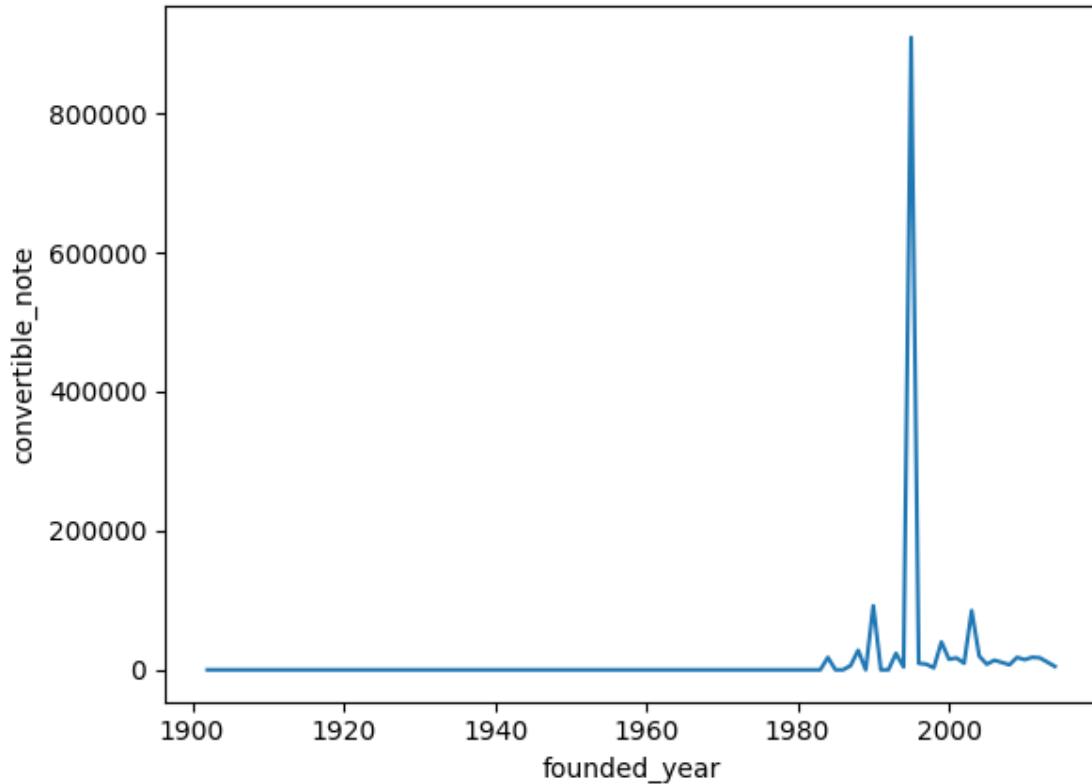
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'sum'}).reset_index()
      ↪sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='convertible_note'>
```



```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'mean'}).reset_index().  
      ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

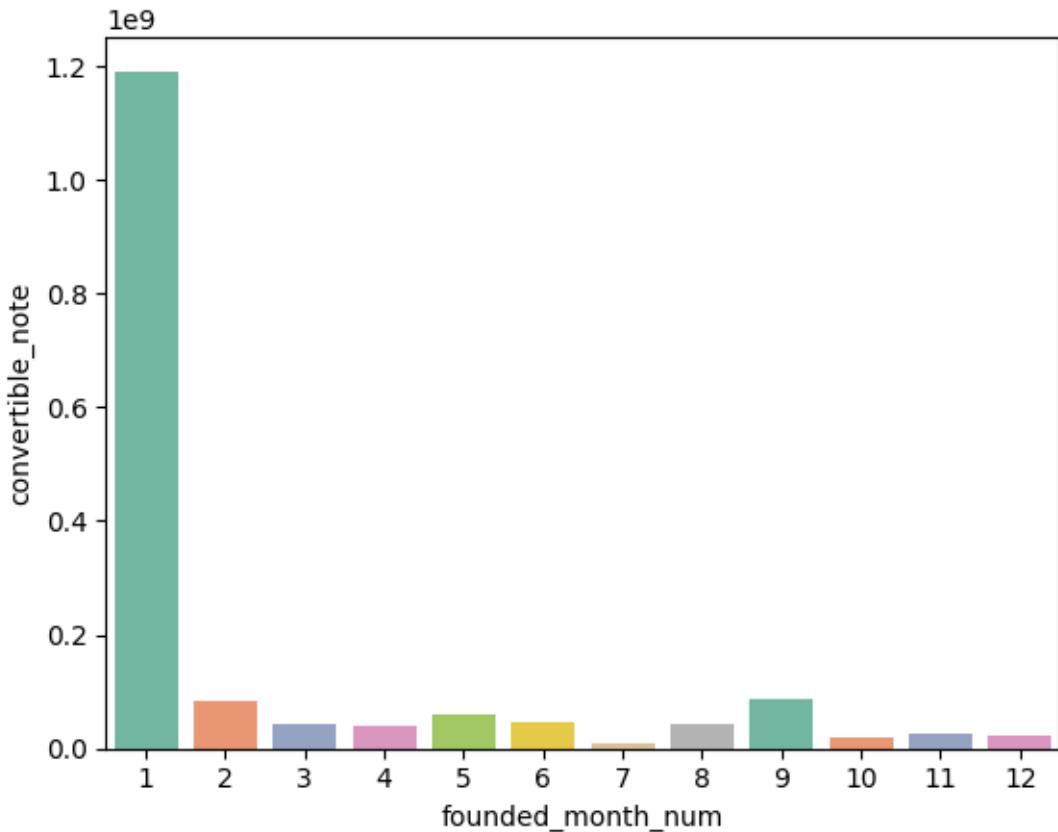
```
[ ]: <Axes: xlabel='founded_year', ylabel='convertible_note'>
```



Insights: From the above trend it can be seen that startups found in the 21st century received the largest amount of convertible note fundings.

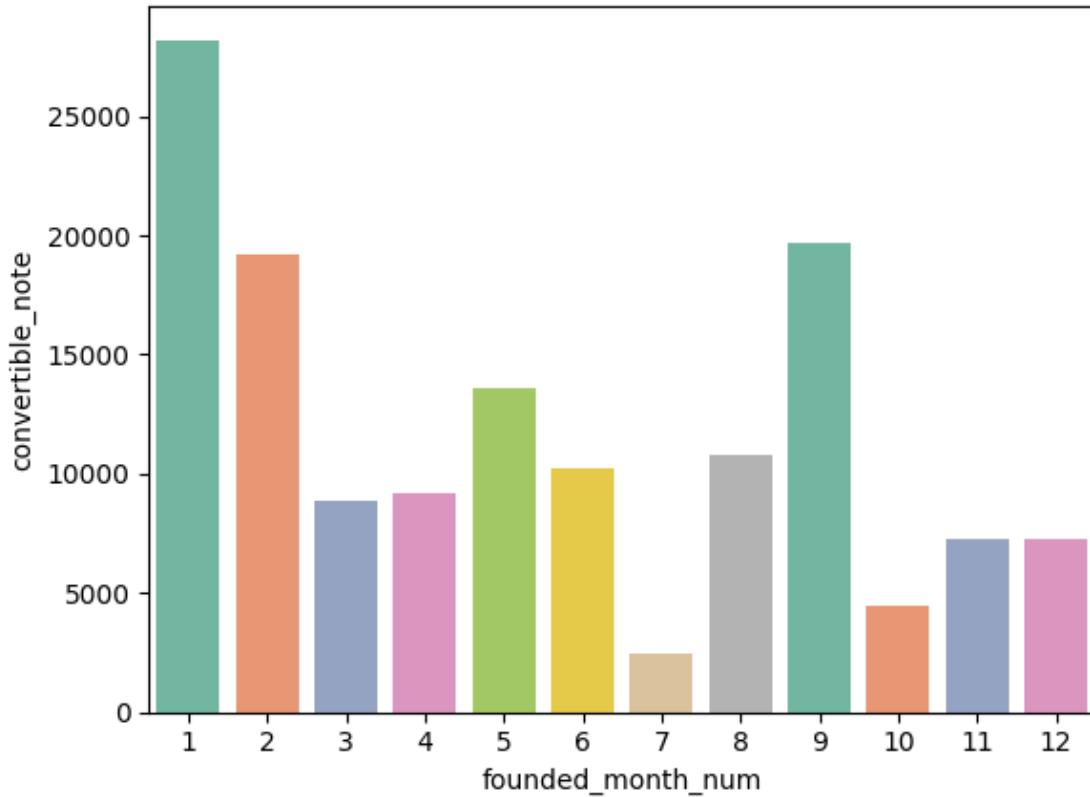
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'sum'}).
      ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='convertible_note'>
```



```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'mean'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_month_num'] > 0]  
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

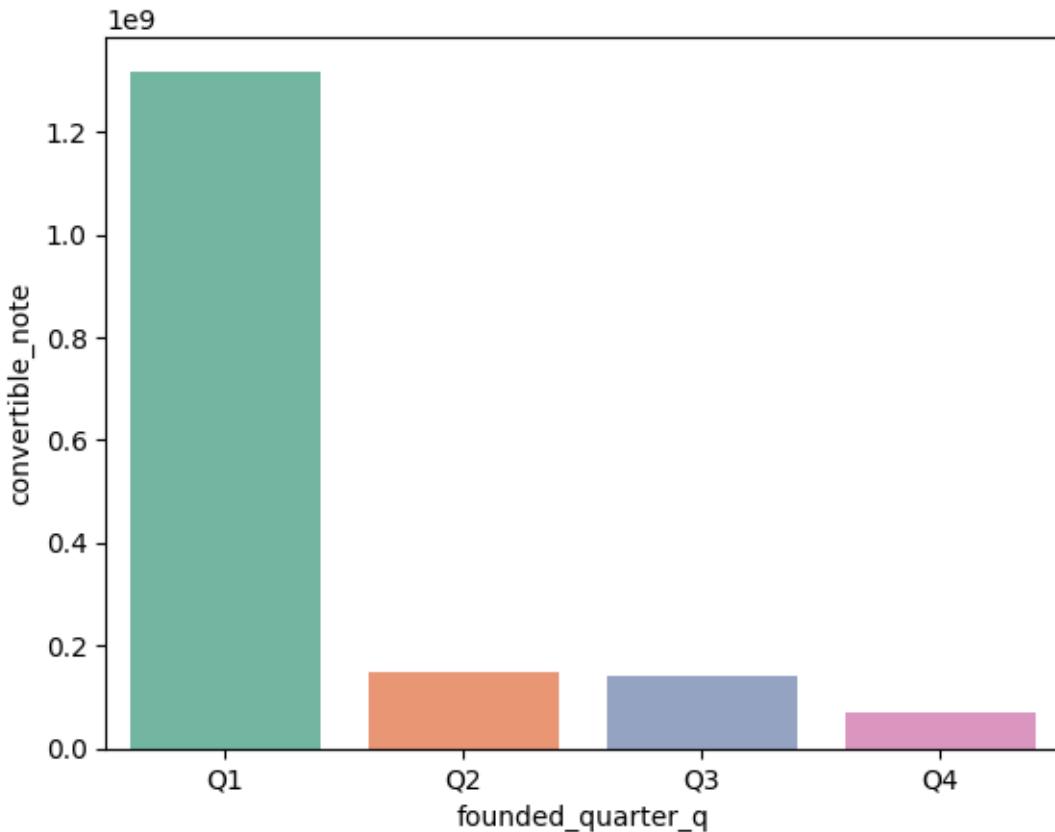
```
[ ]: <Axes: xlabel='founded_month_num', ylabel='convertible_note'>
```



Insights: From the above plot it can be seen that start ups founded in the month of January have attracted the most amount of convertible note fundings

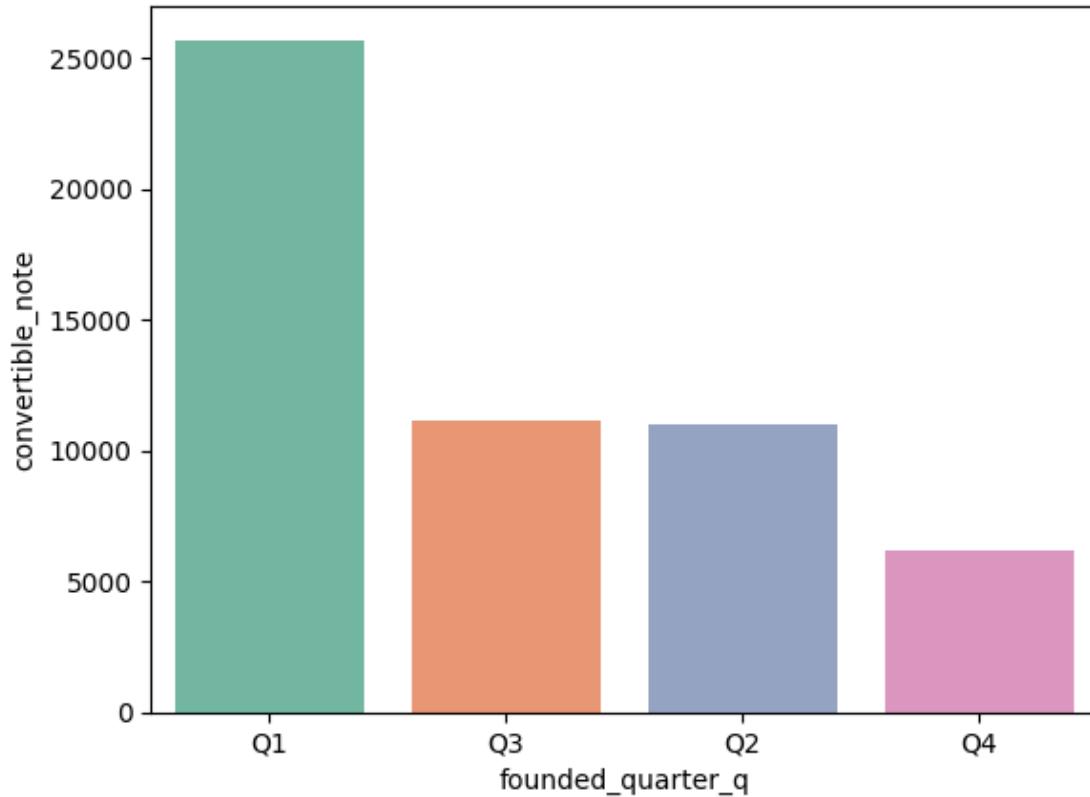
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'sum'}).  
      ↪reset_index().sort_values(column,ascending=False)  
df_plot = df_plot[df_plot['founded_quarter_q']!= 'Q0']  
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='convertible_note'>
```



```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'mean'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']  
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

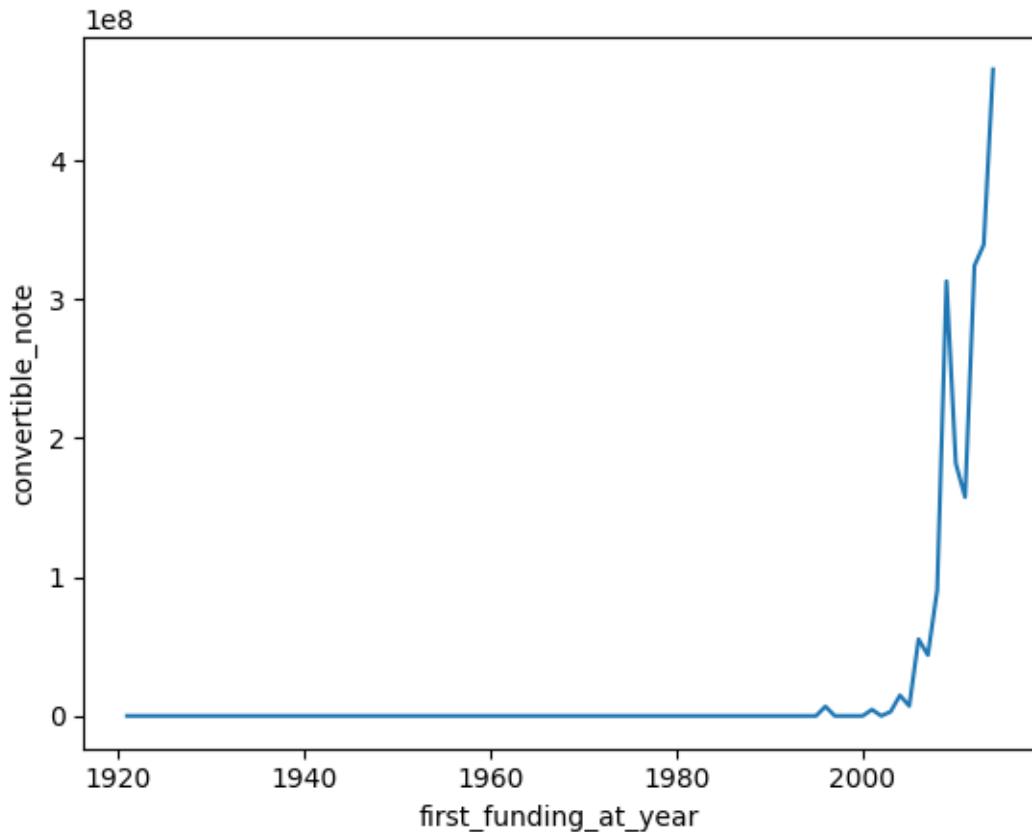
```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='convertible_note'>
```



Insights: From both plots it is evident that startups founded in the first quarter have attracted the most amount of convertible note fundings

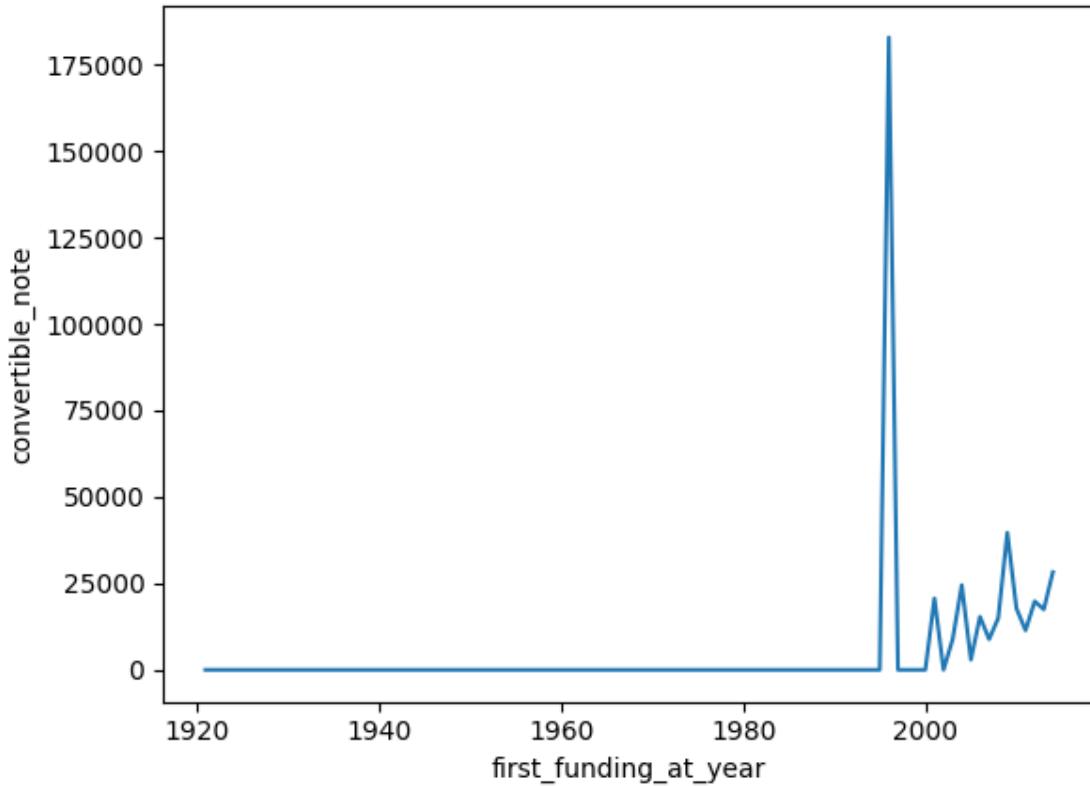
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'sum'})  
    ↪reset_index().sort_values(column,ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='convertible_note'>
```



```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='convertible_note'>
```

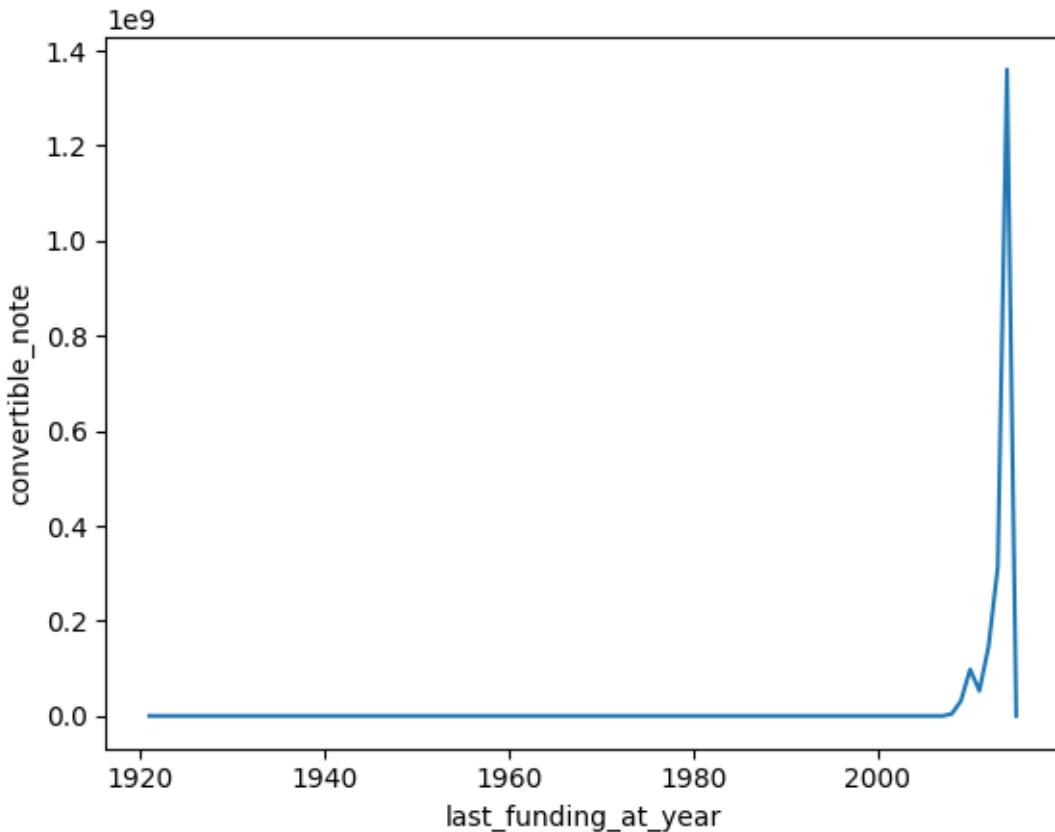


Insights: It can be seen from the plots that a lot of startups received their first funding in the early 21st century, attracted a large amount of convertible note funding.

Insights: From the plot of top 10 categories, Biotechnology has the largest number of average funding rounds.

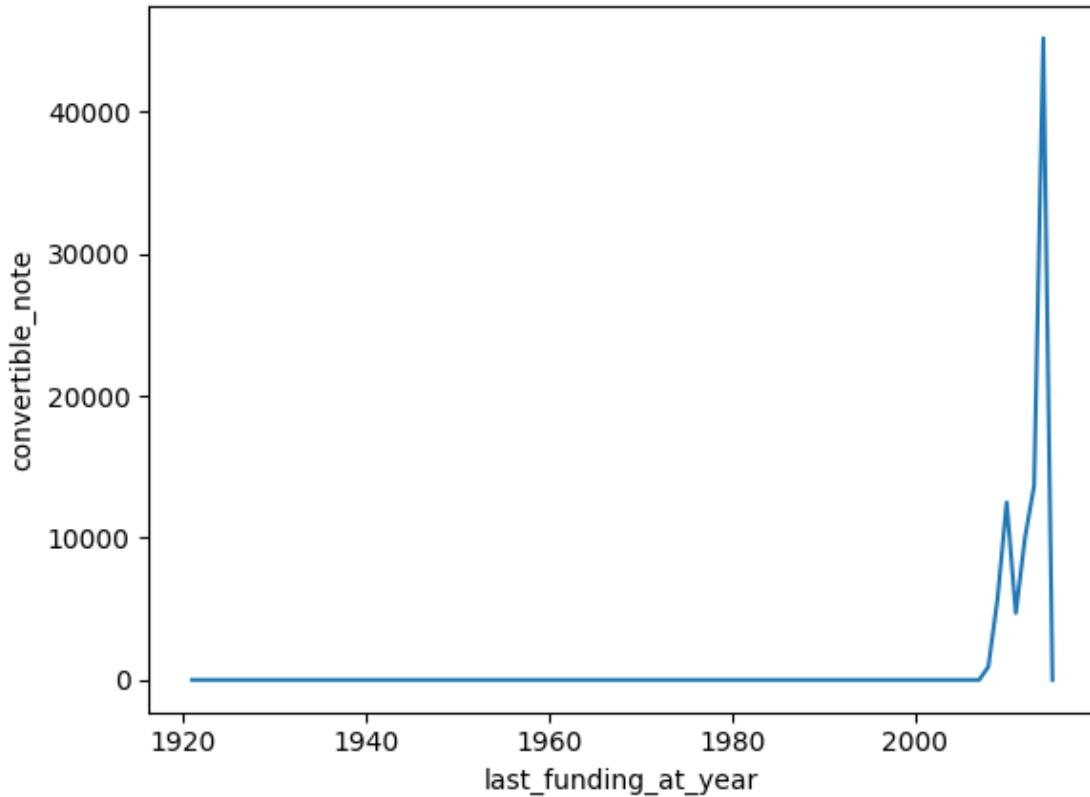
```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'sum'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='convertible_note'>
```



```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='convertible_note'>
```



Insights: It can be seen from the plots that a lot of start-ups that received their last funding in the early 21st century attracted a large amount of convertible note fundings

## 1.10 Debt Financed Funds

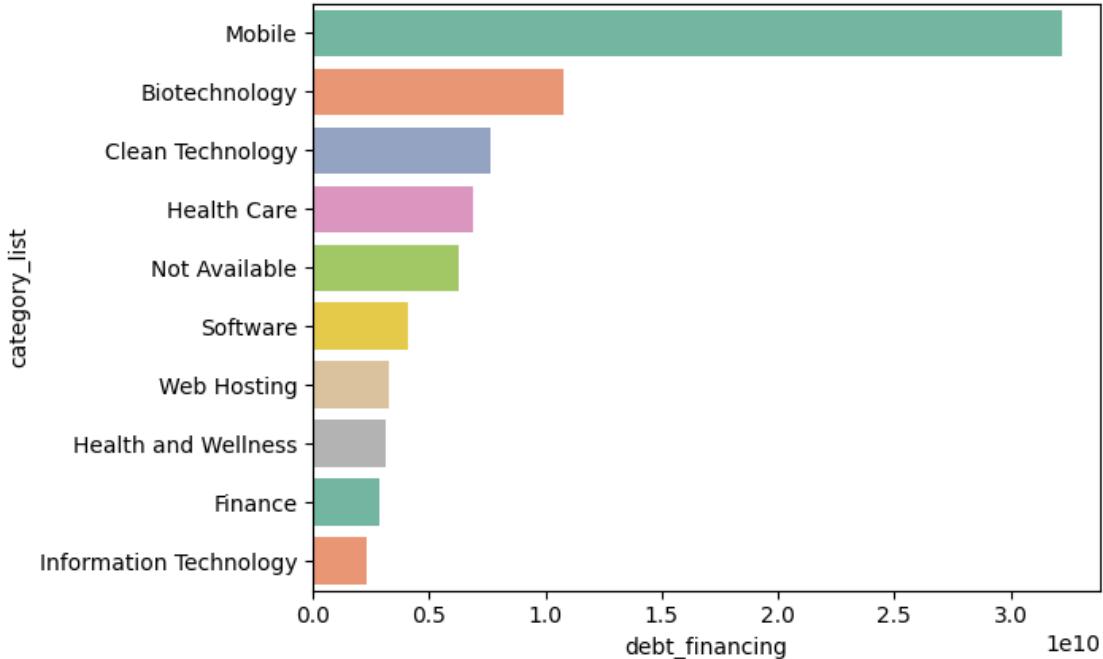
1. Debt funding is a way to raise money by taking on debt, or borrowing money, from an external source.
2. The borrower is obligated to repay the principal amount plus interest over a set period of time.

Average and Total Analysis of the Debt Financed Funds as shown below.

```
[ ]: column = 'debt_financing'

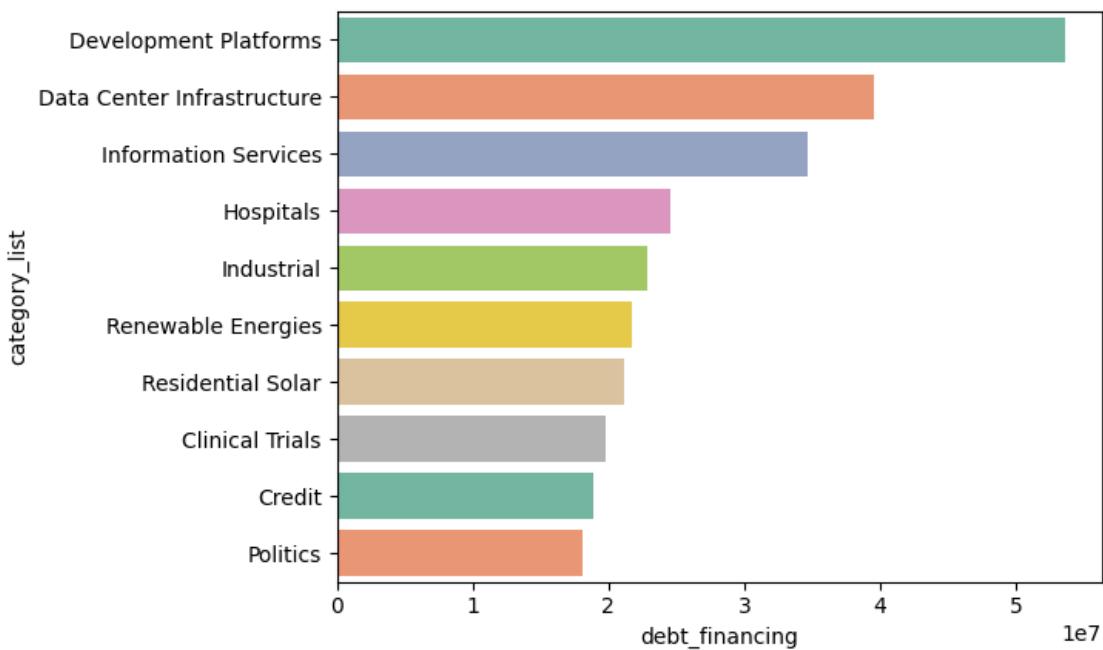
[ ]: df_plot = df_clean.groupby('category_list').agg({column: 'sum'}).reset_index()
     .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')

[ ]: <Axes: xlabel='debt_financing', ylabel='category_list'>
```



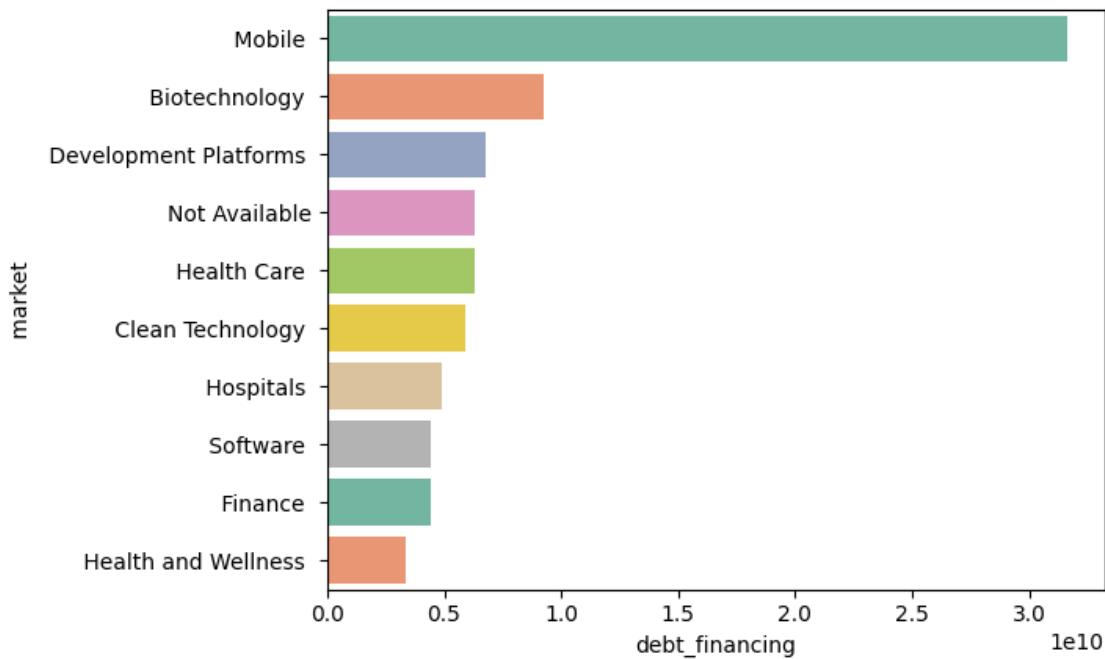
```
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'mean'}).reset_index()
      .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')
```

```
[ ]: <Axes: xlabel='debt_financing', ylabel='category_list'>
```



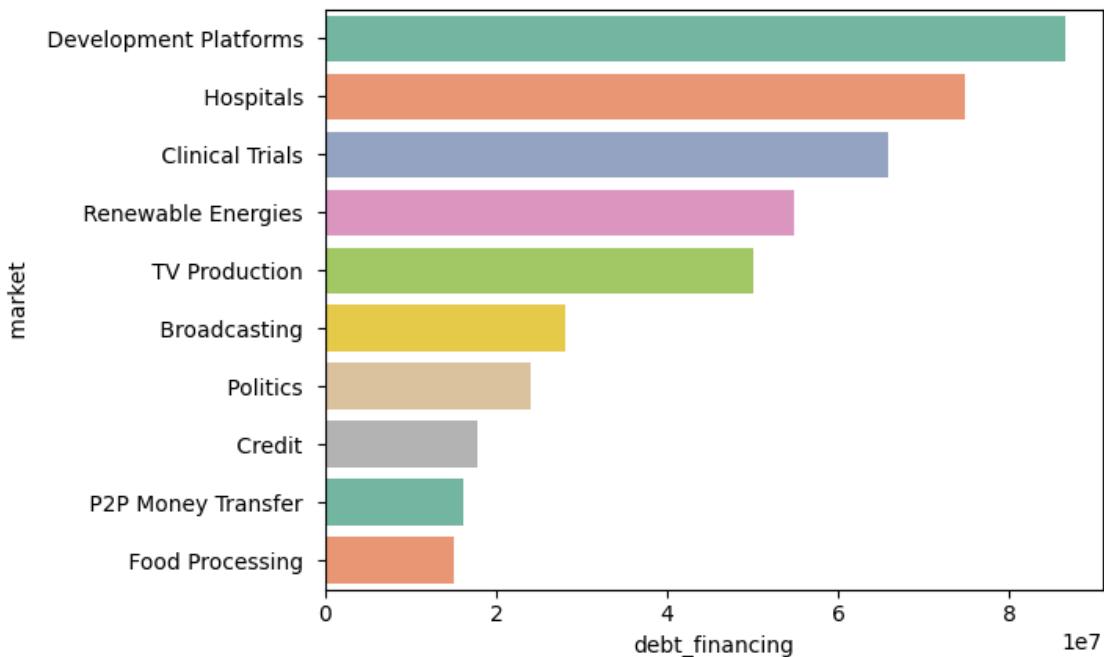
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'sum'}).reset_index() .  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='debt_financing', ylabel=' market '>
```



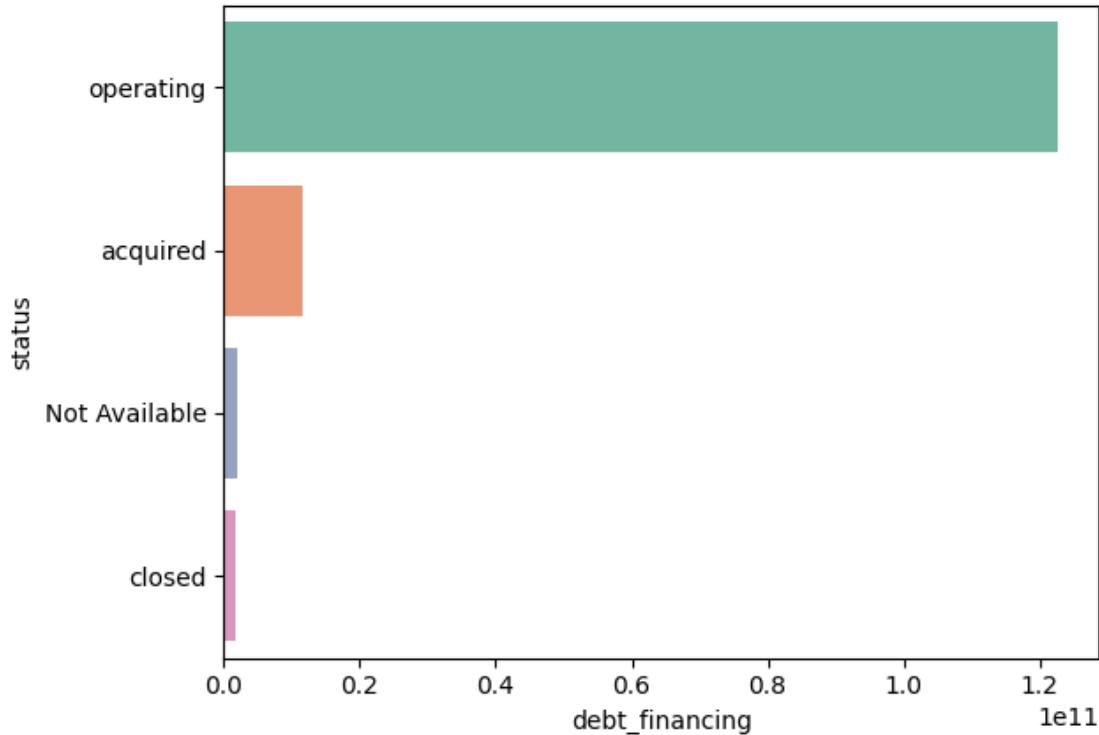
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='debt_financing', ylabel=' market '>
```



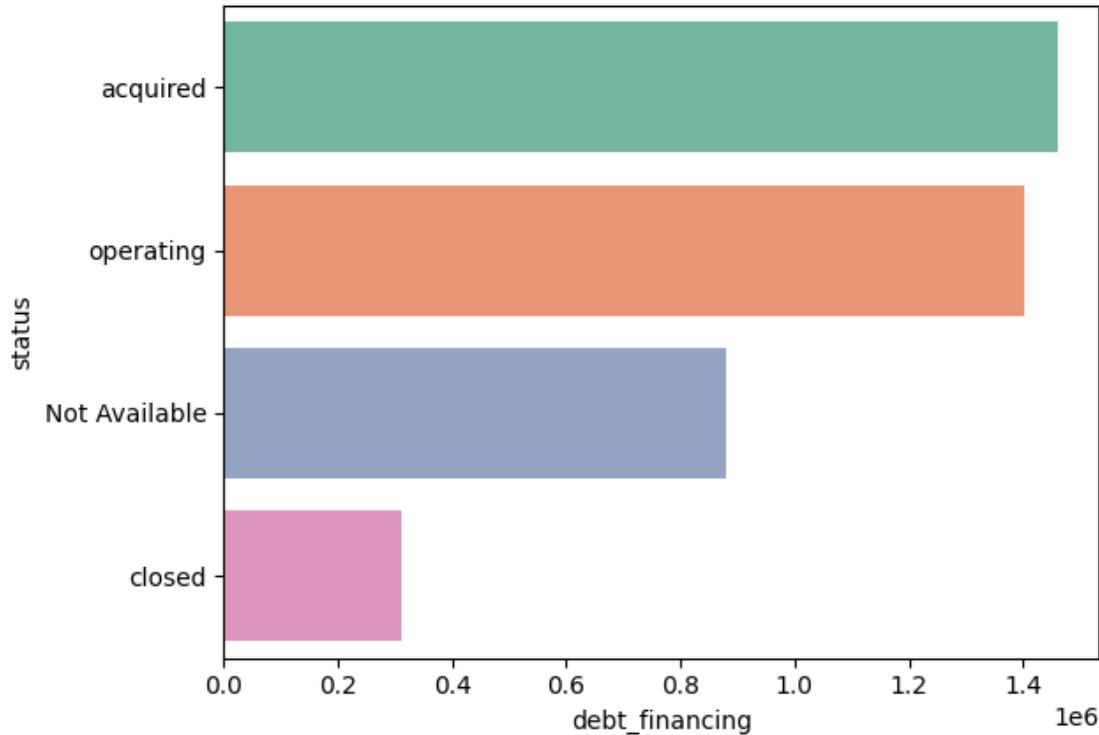
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='debt_financing', ylabel='status'>
```



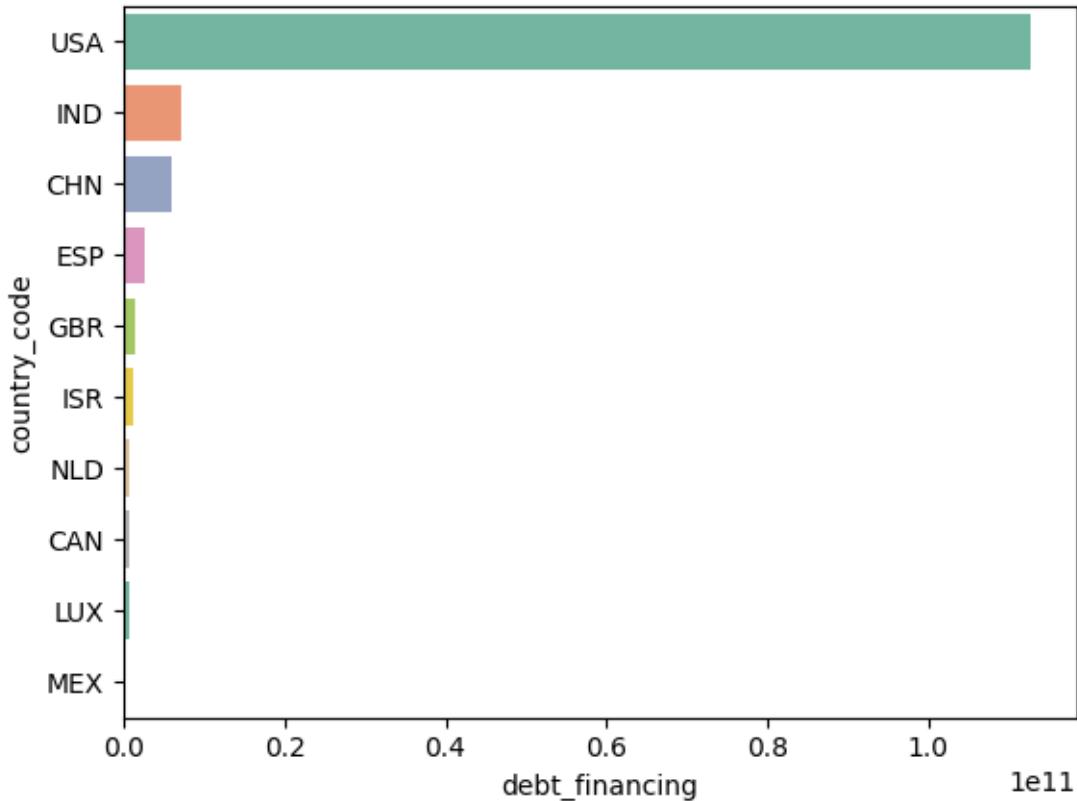
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'mean'}).reset_index()
      .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='debt_financing', ylabel='status'>
```



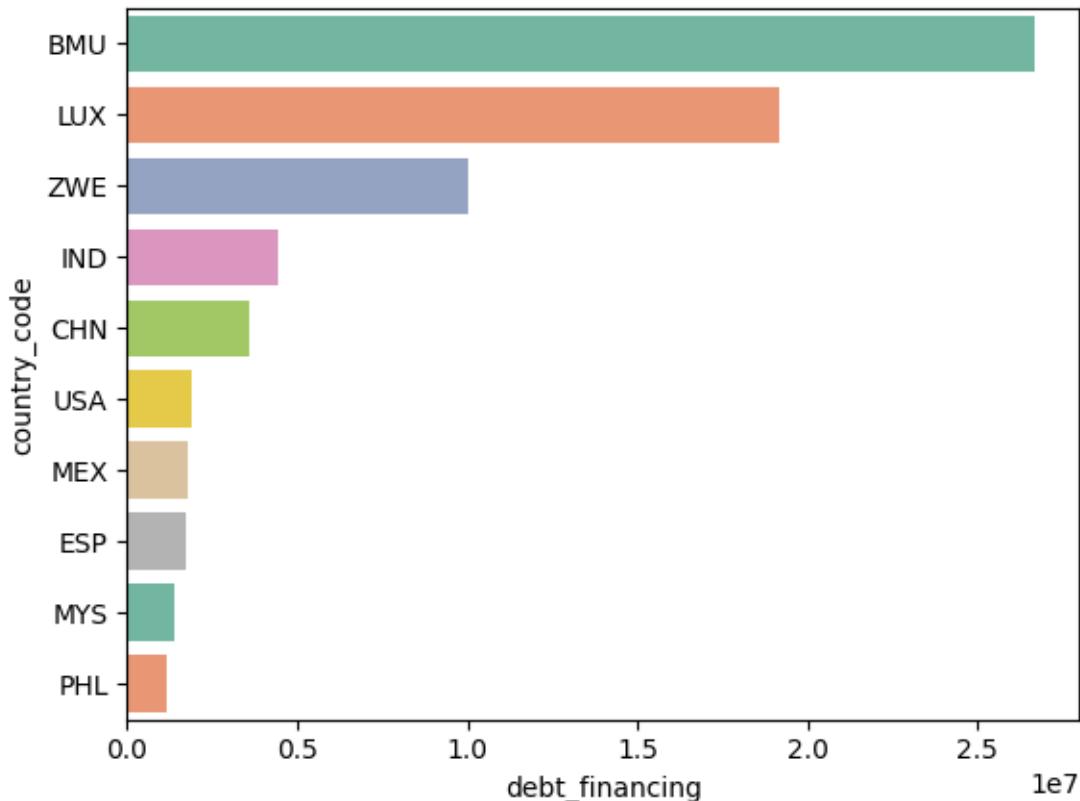
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column,ascending=False).head(11)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='debt_financing', ylabel='country_code'>
```



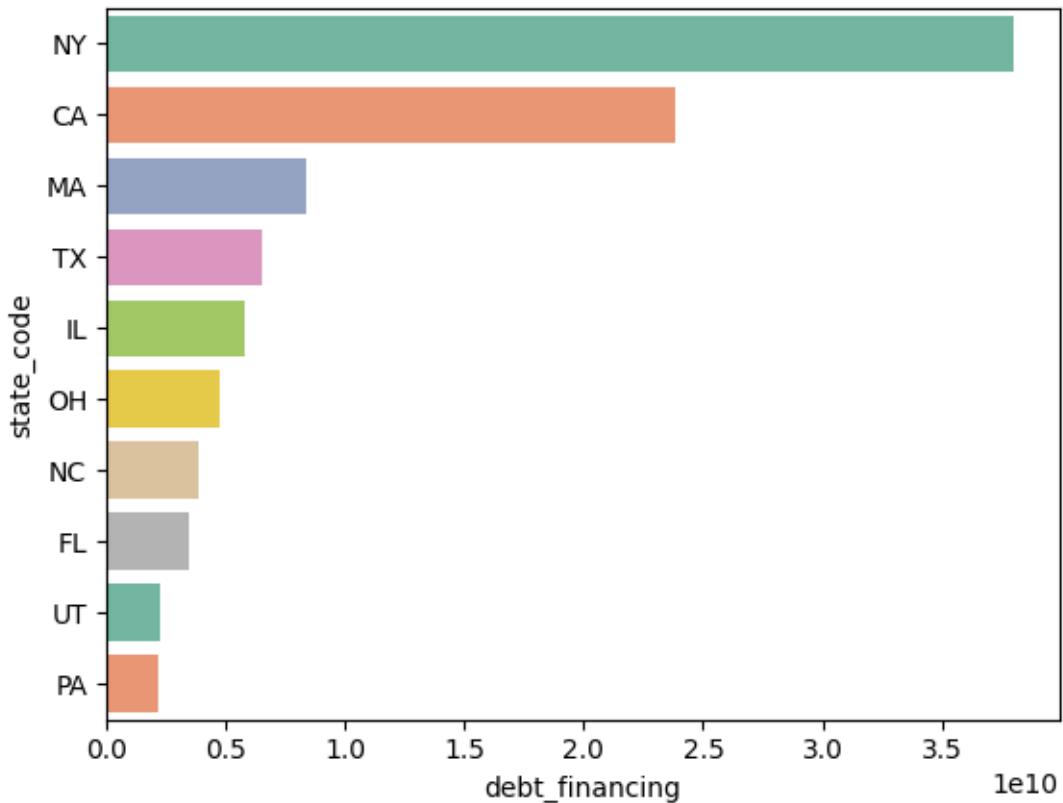
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='debt_financing', ylabel='country_code'>
```



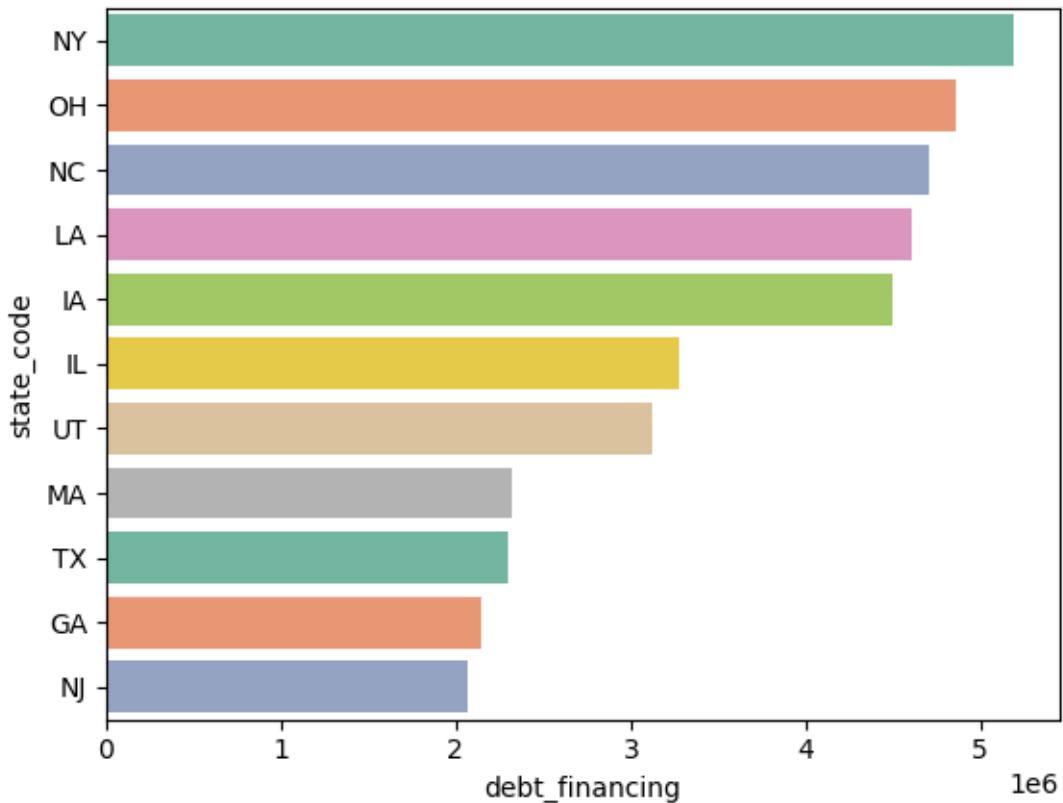
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='debt_financing', ylabel='state_code'>
```



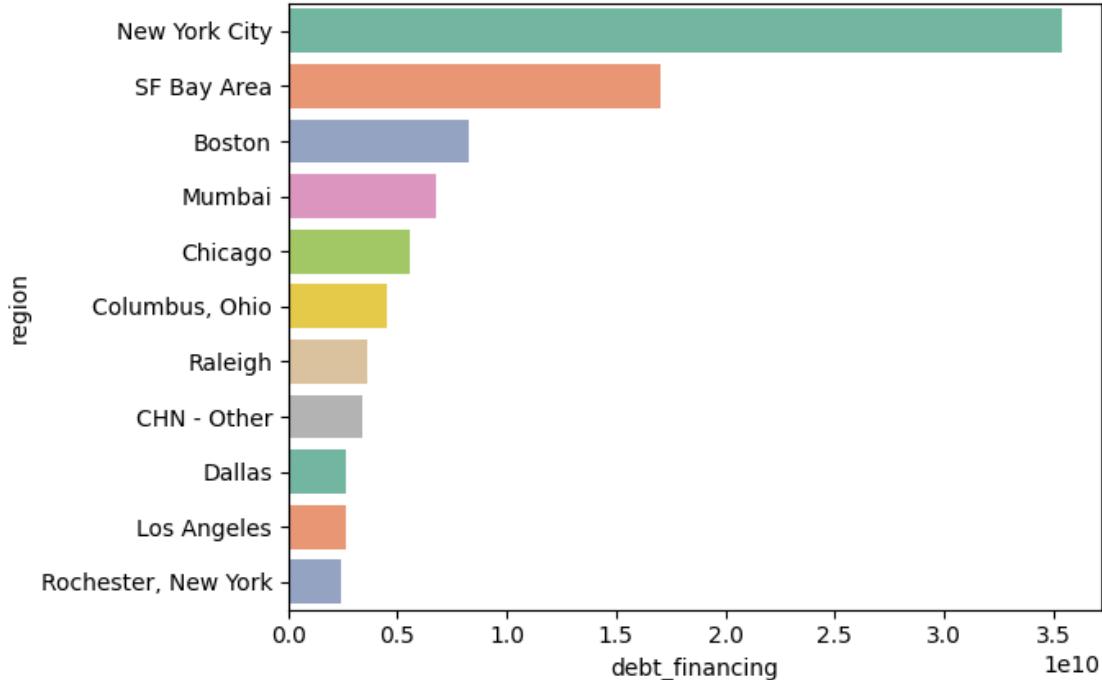
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'mean'}).reset_index().  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='debt_financing', ylabel='state_code'>
```



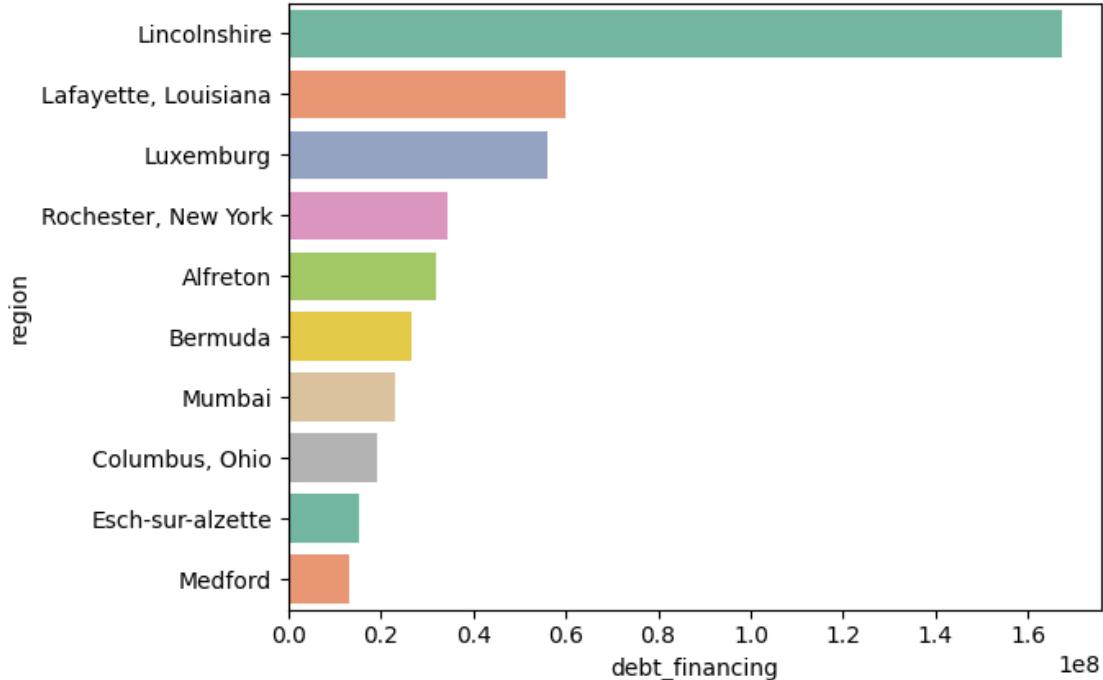
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='debt_financing', ylabel='region'>
```



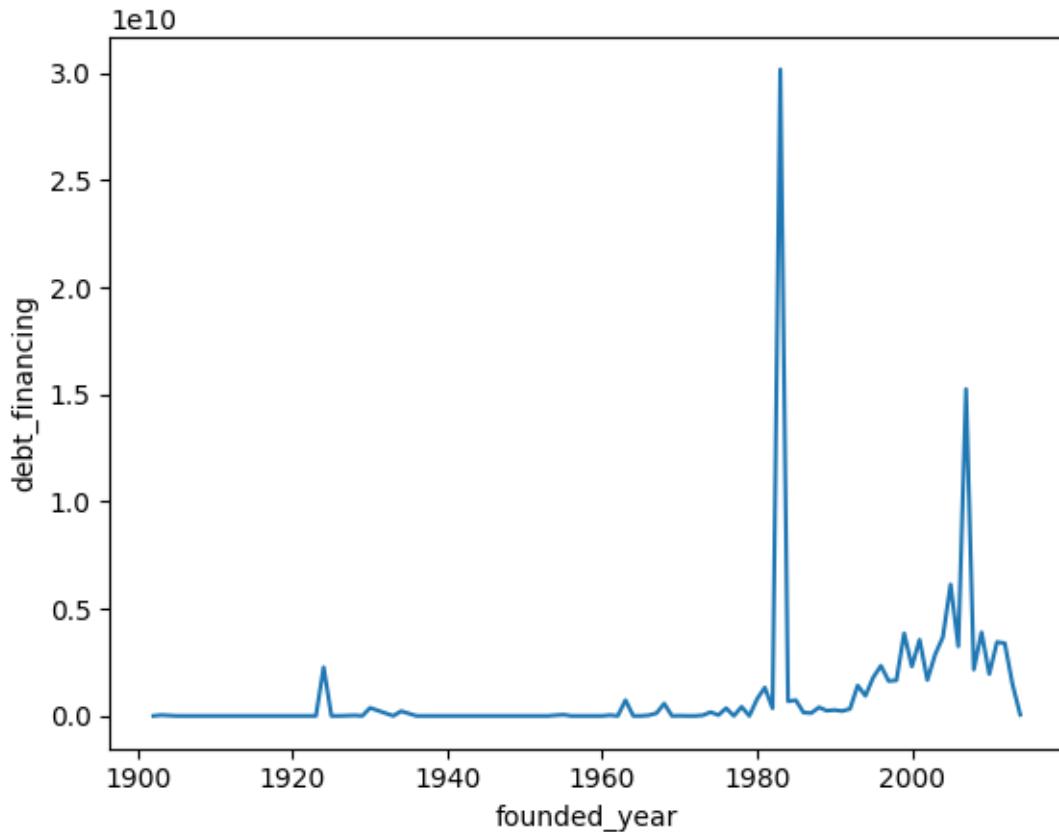
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'mean'}).reset_index().  
    ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['region']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='debt_financing', ylabel='region'>
```

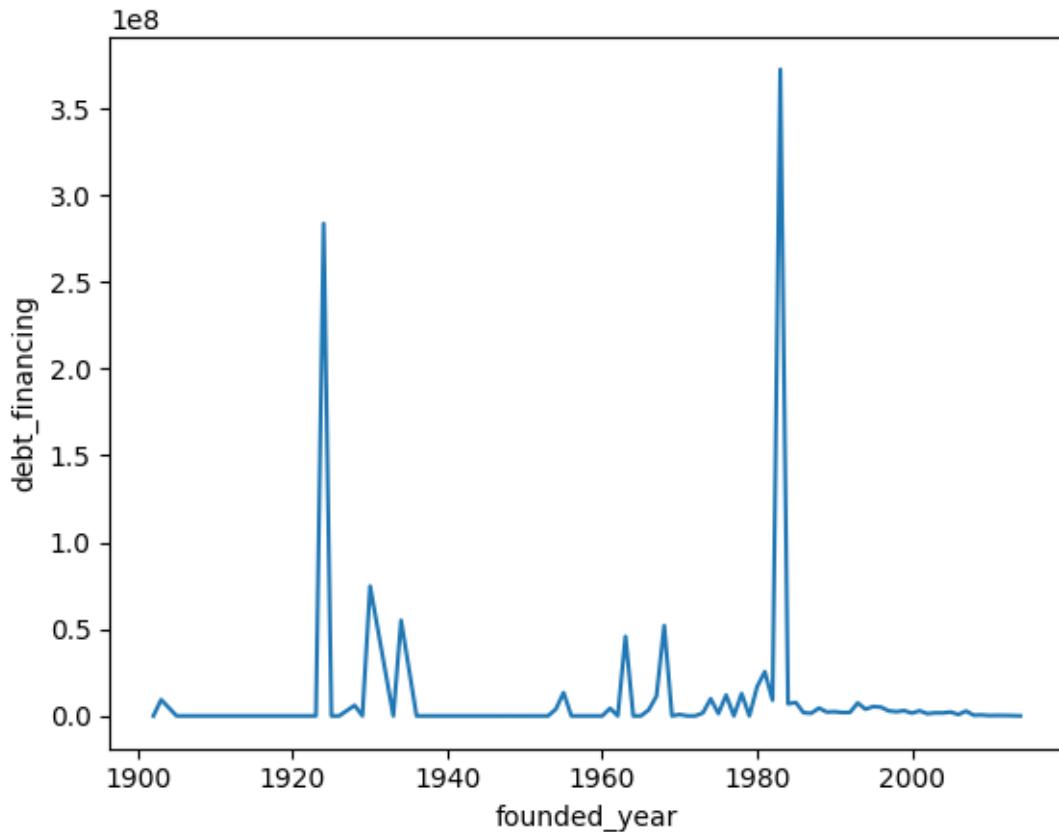


```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column: 'sum'}).reset_index()
      ↪sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='debt_financing'>
```

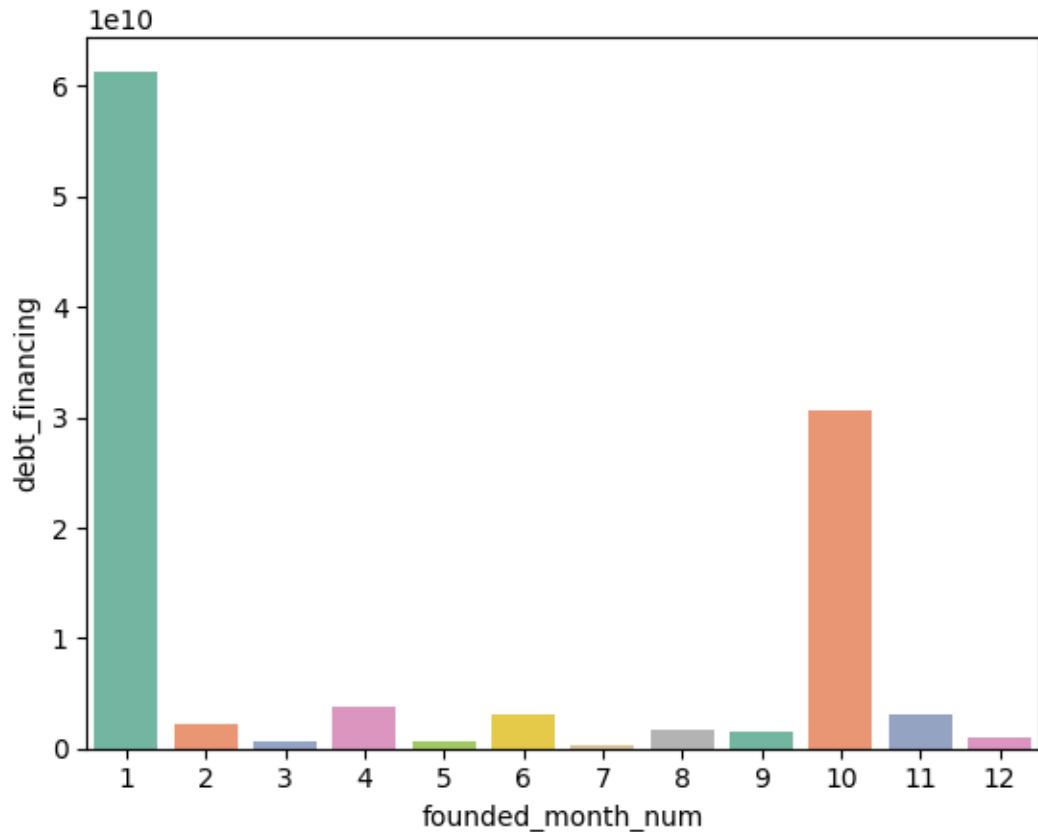


```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'mean'}).reset_index().  
      ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])  
  
[ ]: <Axes: xlabel='founded_year', ylabel='debt_financing'>
```



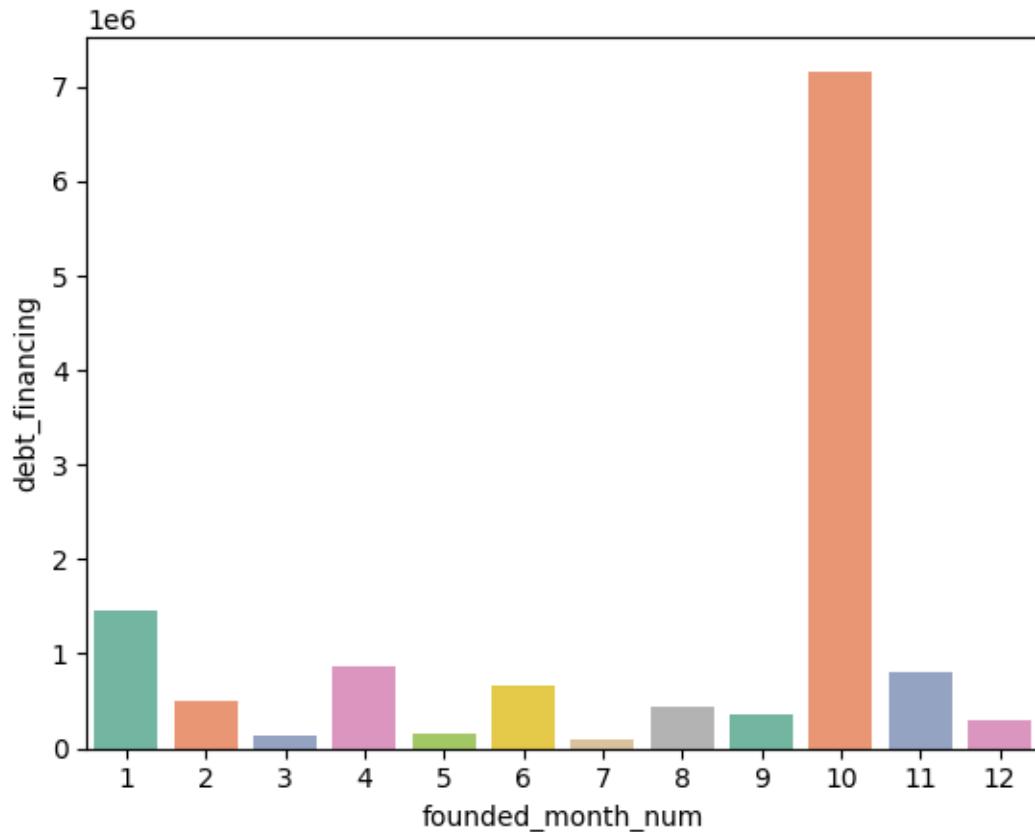
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'sum'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='debt_financing'>
```



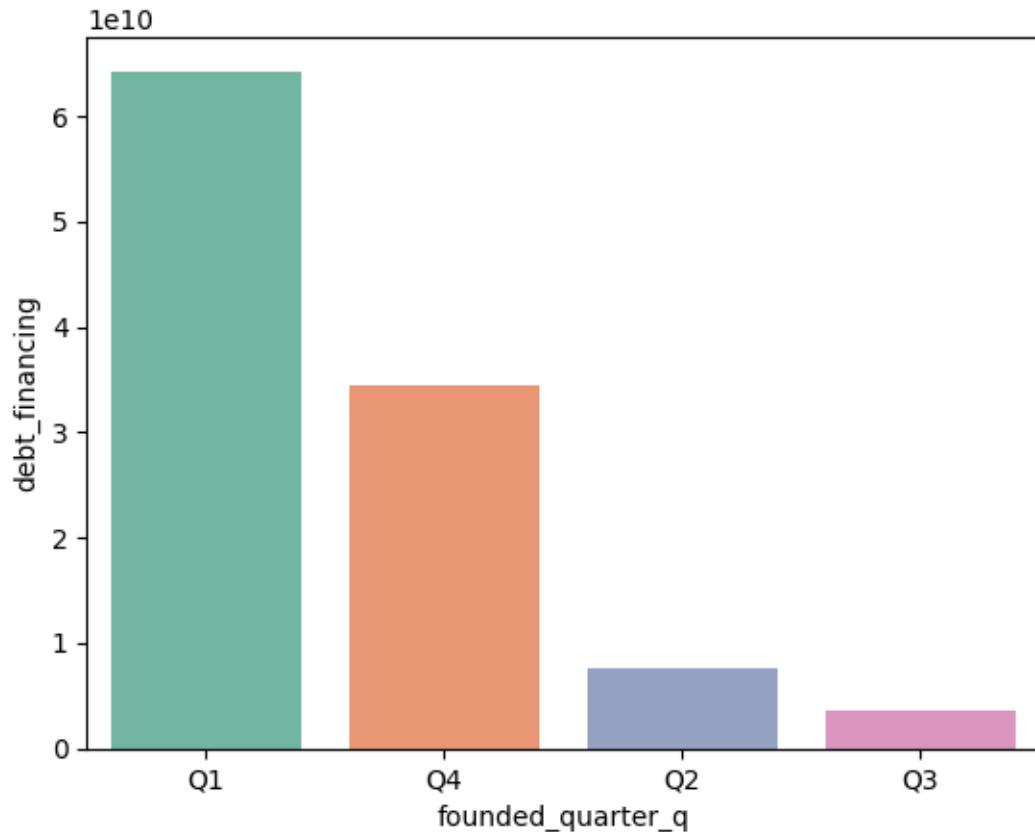
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='debt_financing'>
```



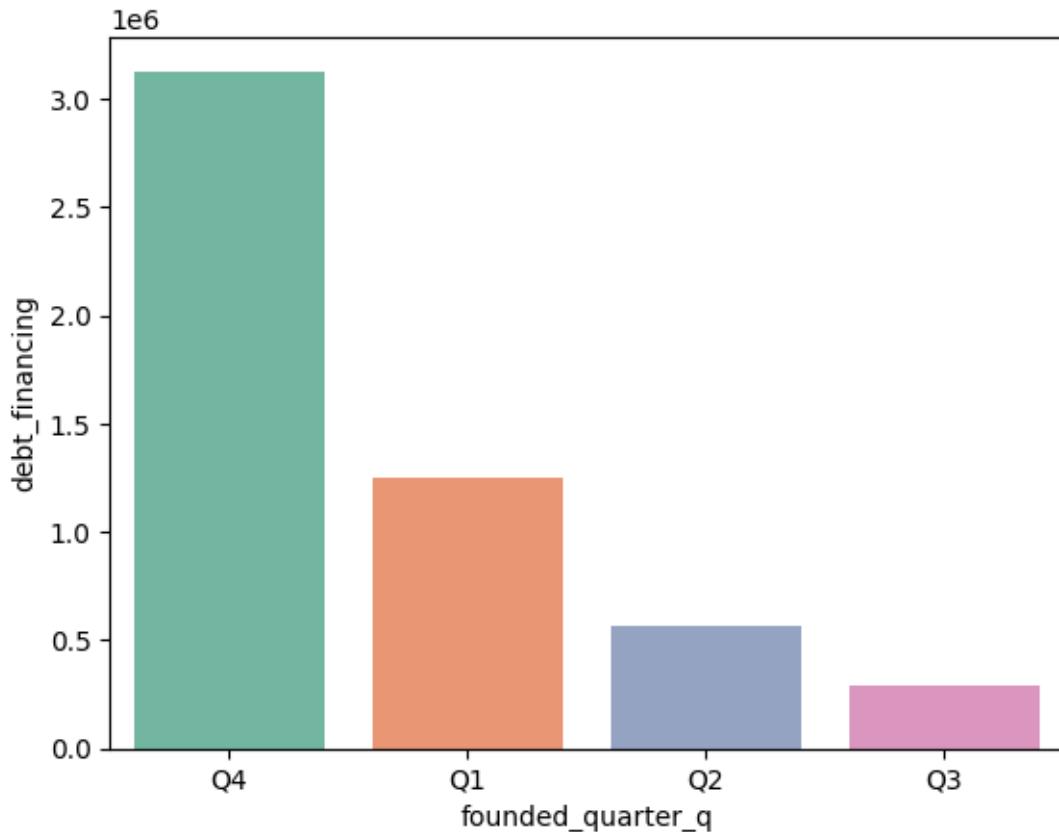
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'sum'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q']!= 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='debt_financing'>
```



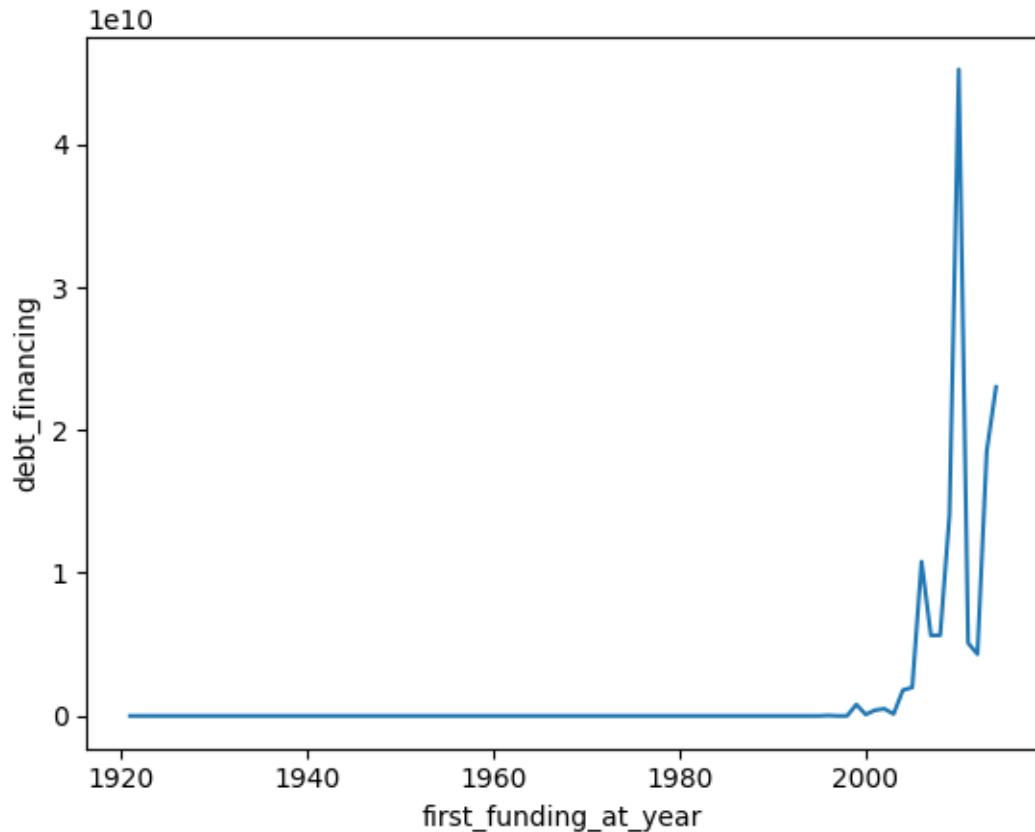
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'mean'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']  
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='debt_financing'>
```



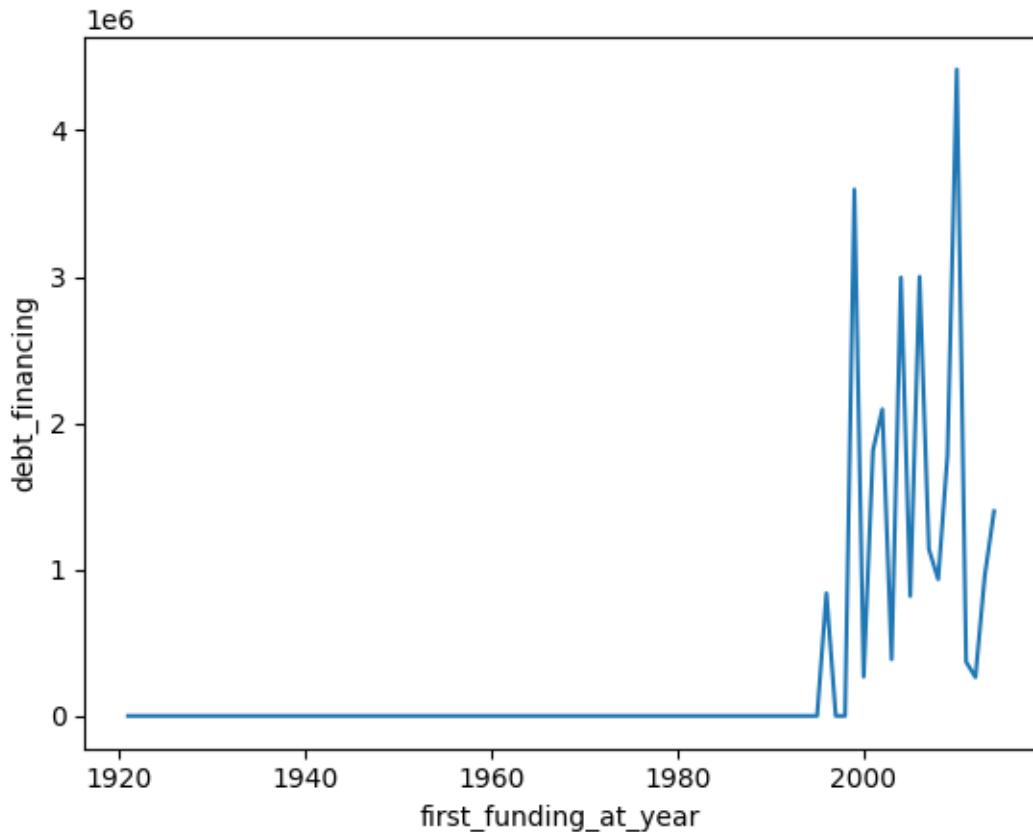
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='debt_financing'>
```



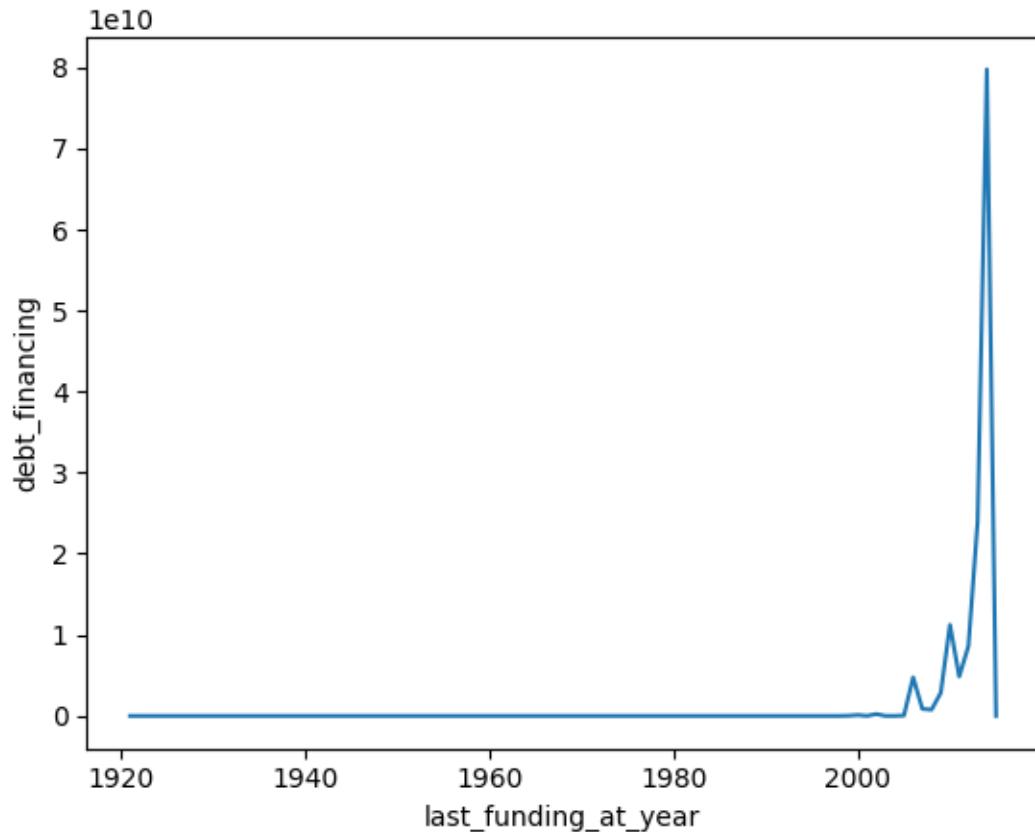
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='debt_financing'>
```



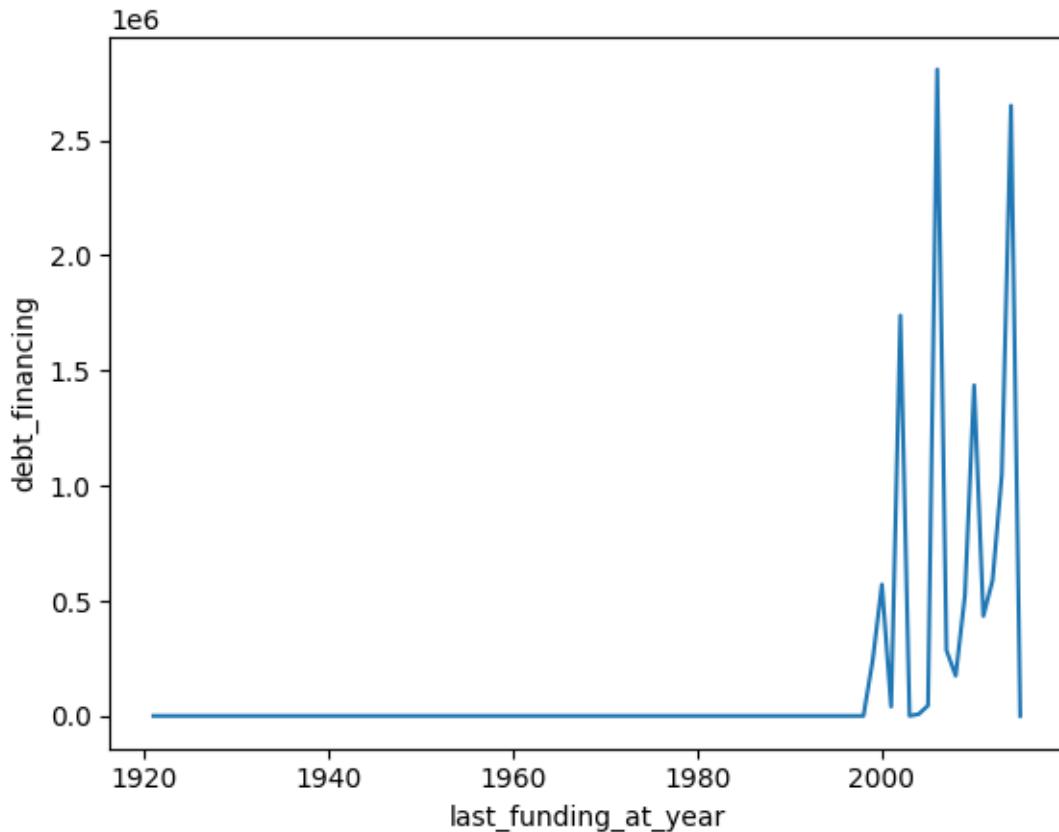
```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='debt_financing'>
```



```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='debt_financing'>
```



## 1.11 Angel Funds

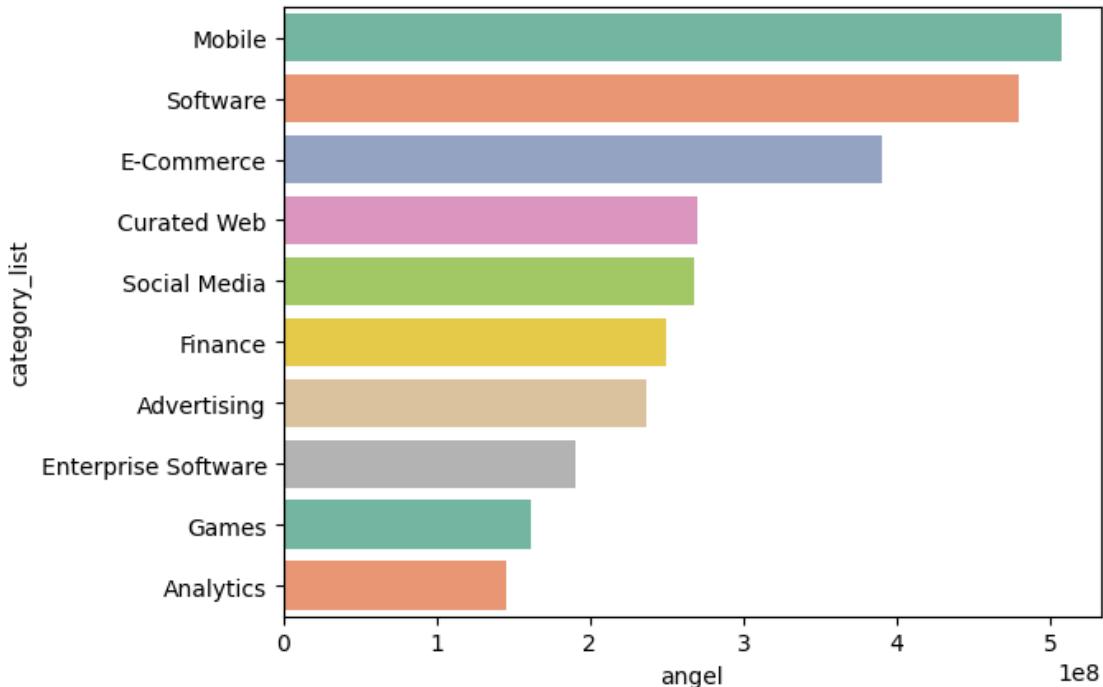
1. Angel financing refers to an investment model wherein “business angels” – essentially, high net worth individuals – provide financial backing for small businesses in exchange for equity in the company.
2. Angel financing can be a one-time investment, or it can refer to ongoing support.

Average and Total Analysis of the Angel Funds as shown below.

```
[ ]: column = 'angel'

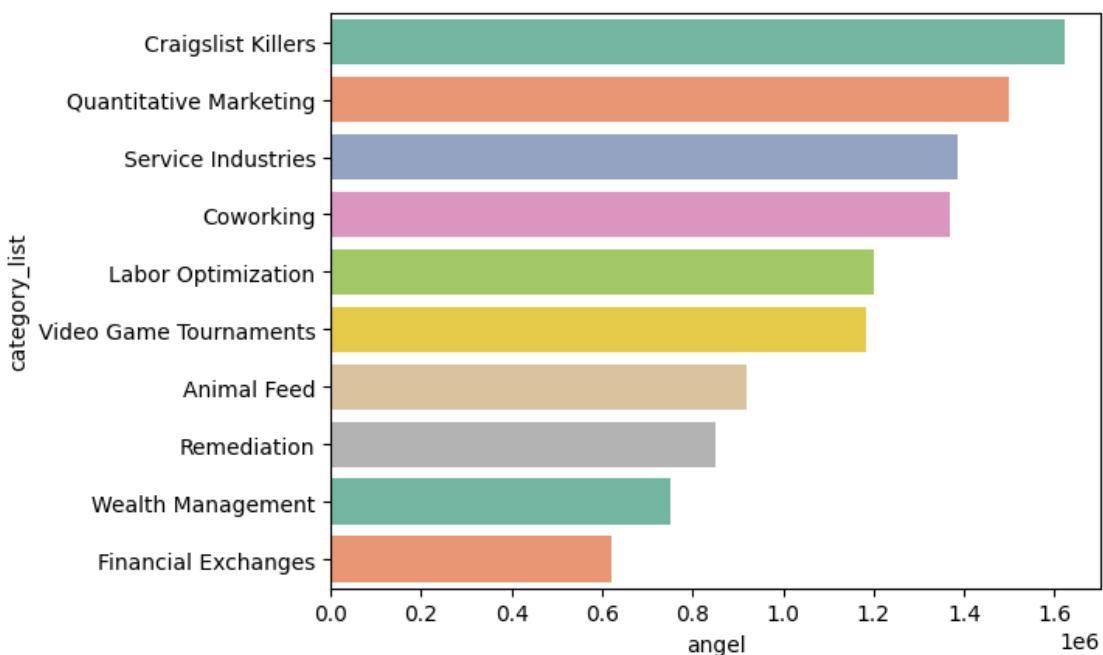
[ ]: df_plot = df_clean.groupby('category_list').agg({column: 'sum'}).reset_index() .
    .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')

[ ]: <Axes: xlabel='angel', ylabel='category_list'>
```



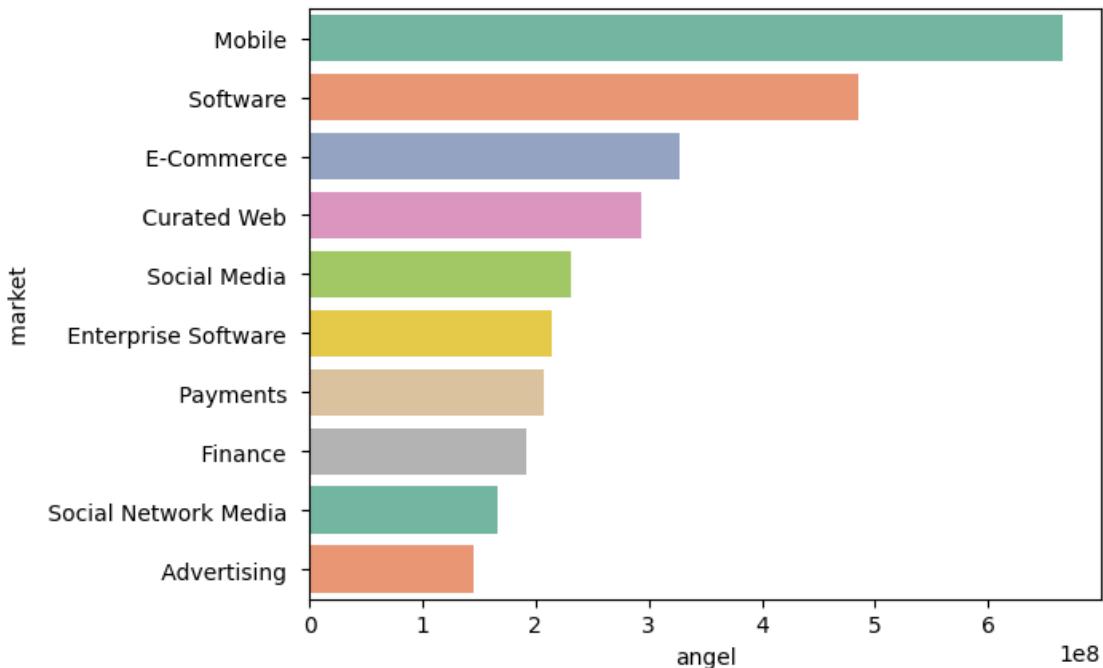
```
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'mean'}).reset_index()
      .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')
```

```
[ ]: <Axes: xlabel='angel', ylabel='category_list'>
```



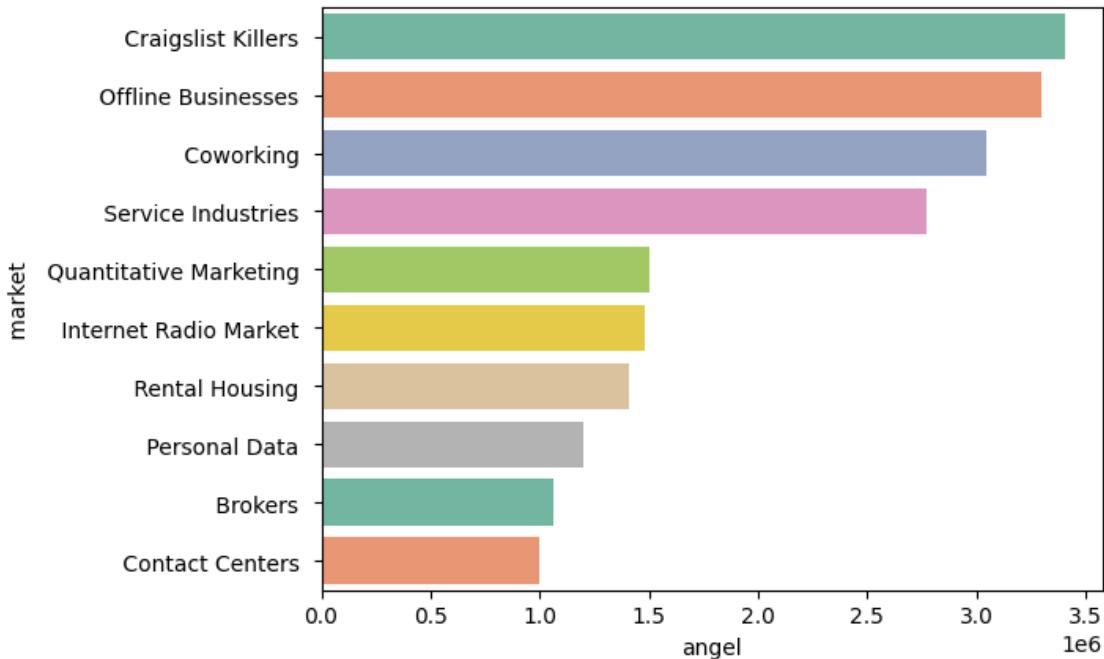
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'sum'}).reset_index() .  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='angel', ylabel=' market '>
```



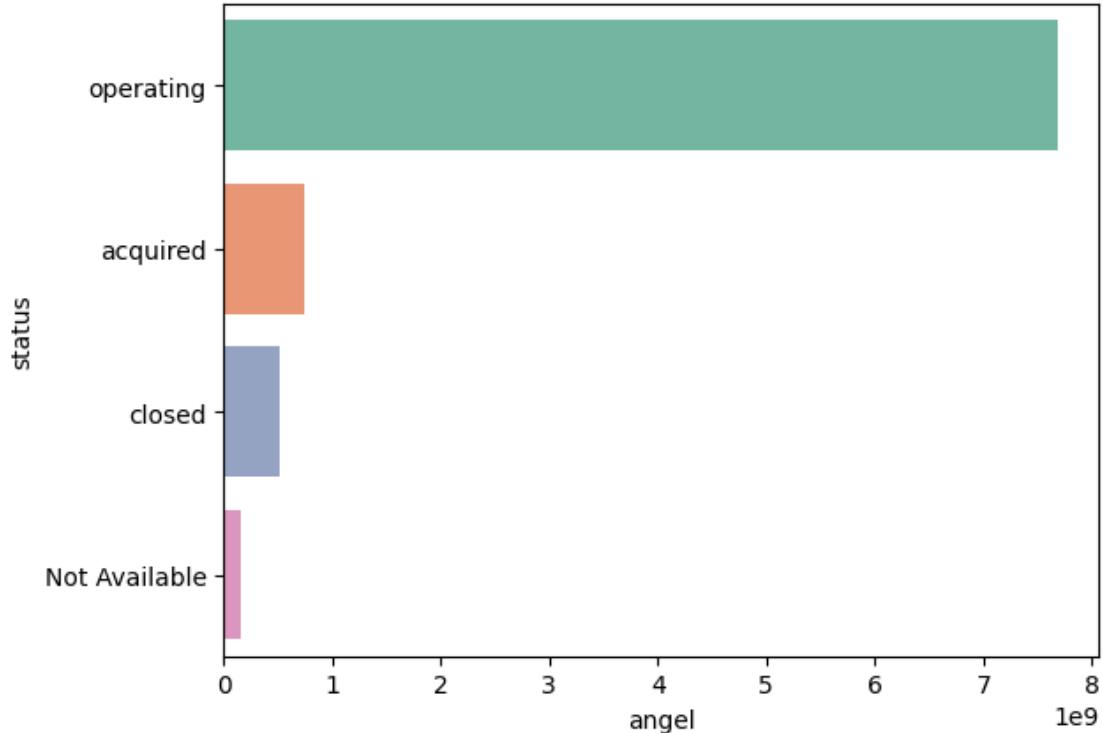
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='angel', ylabel=' market '>
```



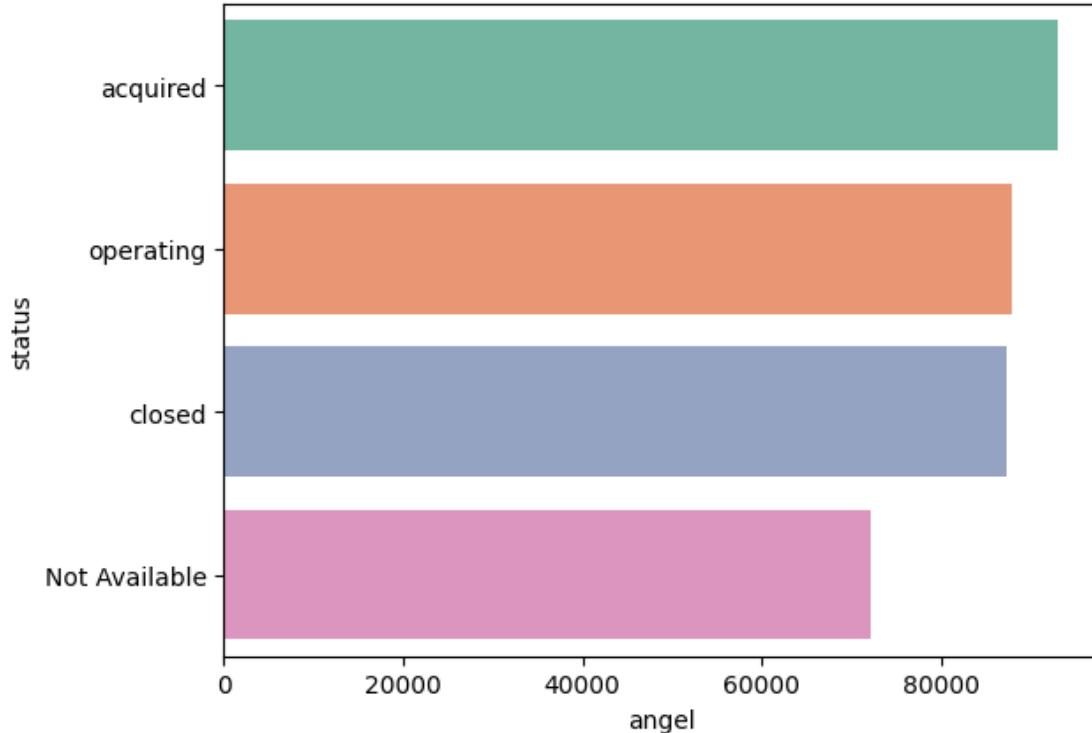
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='angel', ylabel='status'>
```



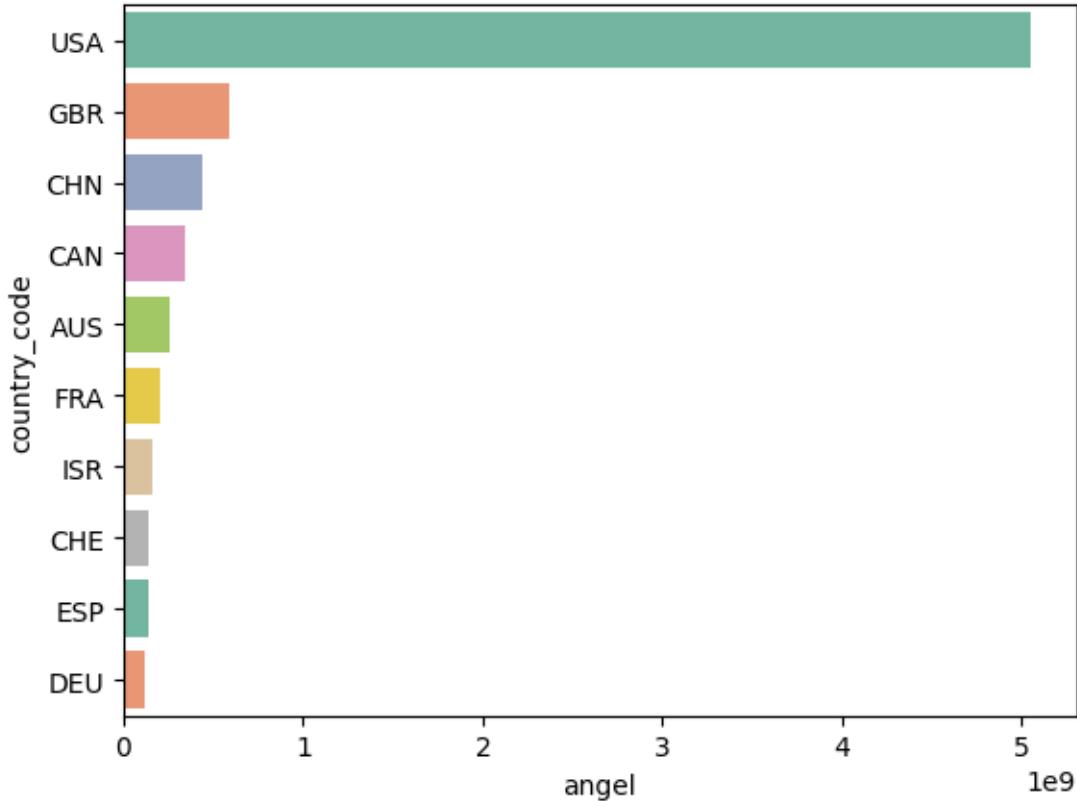
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'mean'}).reset_index()
      .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='angel', ylabel='status'>
```



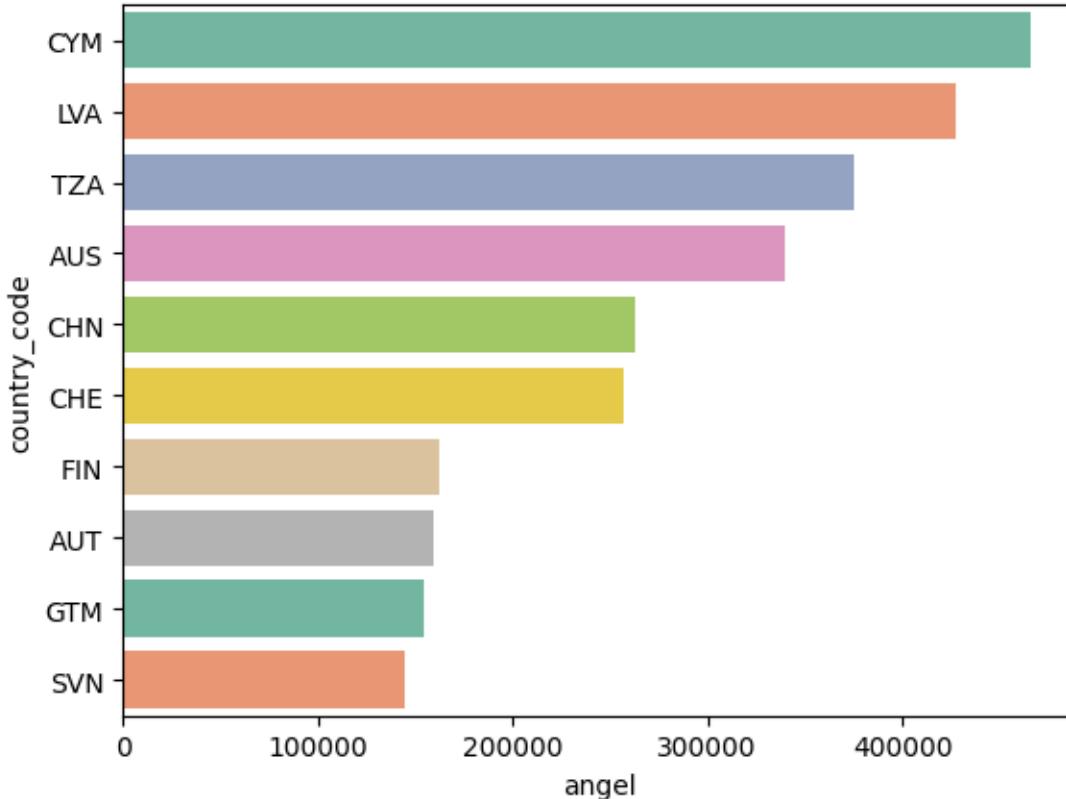
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column,ascending=False).head(11)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='angel', ylabel='country_code'>
```



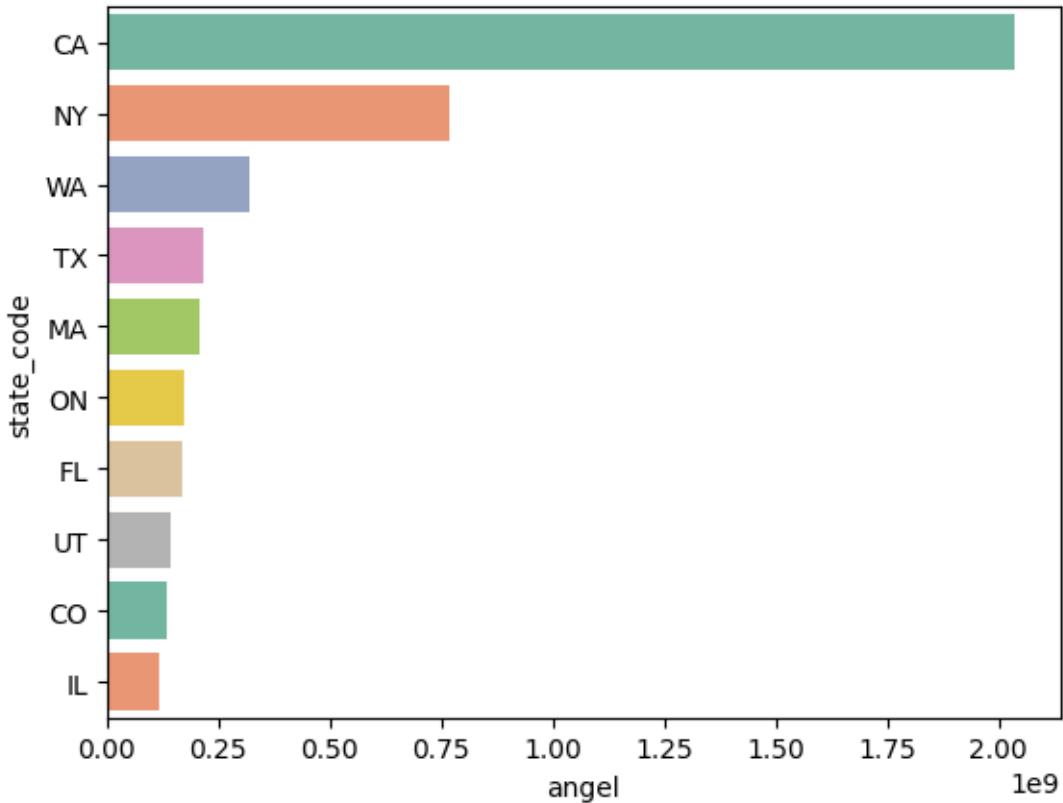
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='angel', ylabel='country_code'>
```



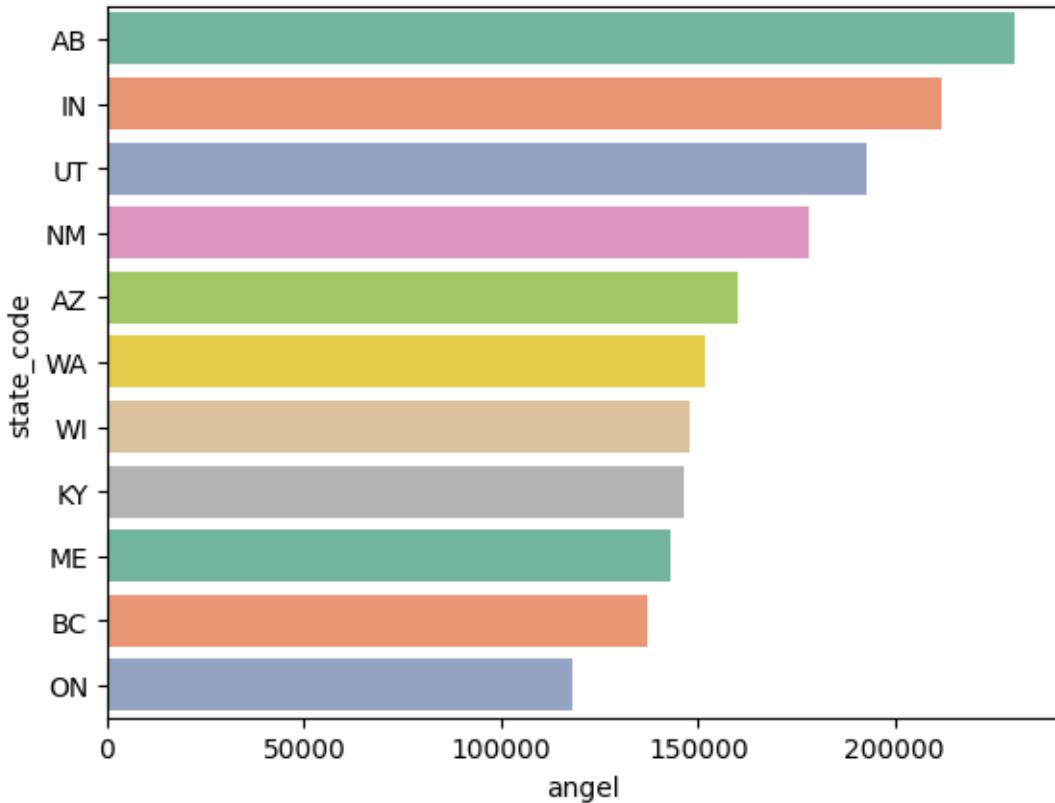
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='angel', ylabel='state_code'>
```



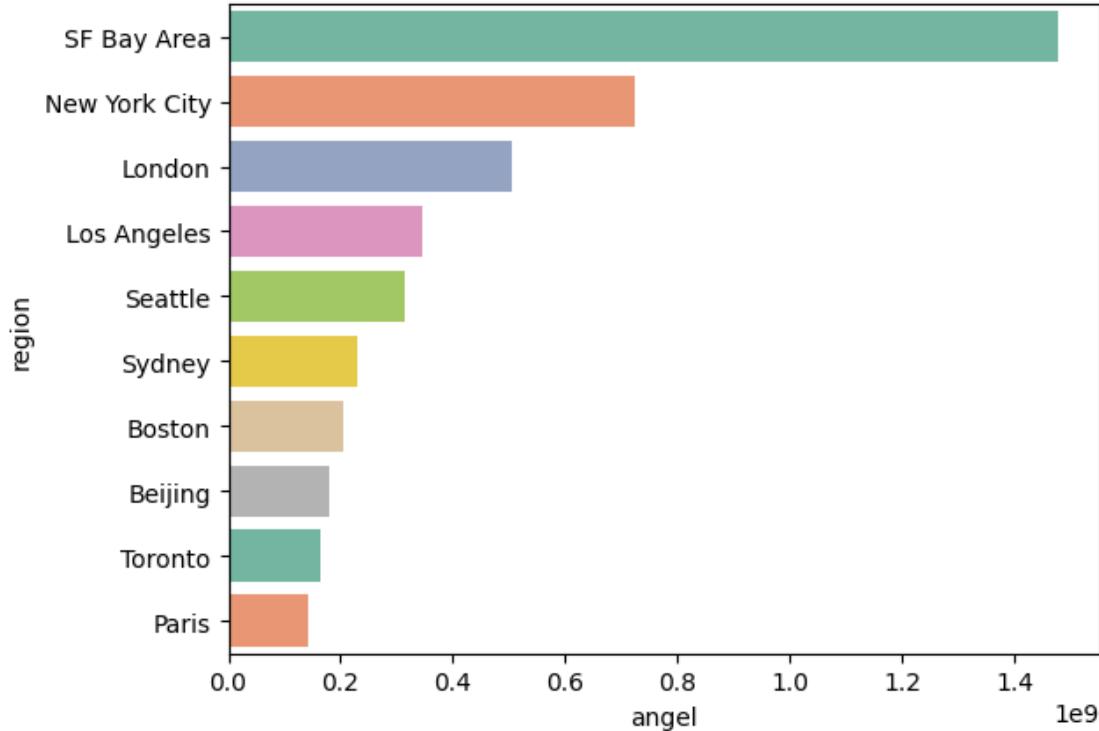
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='angel', ylabel='state_code'>
```



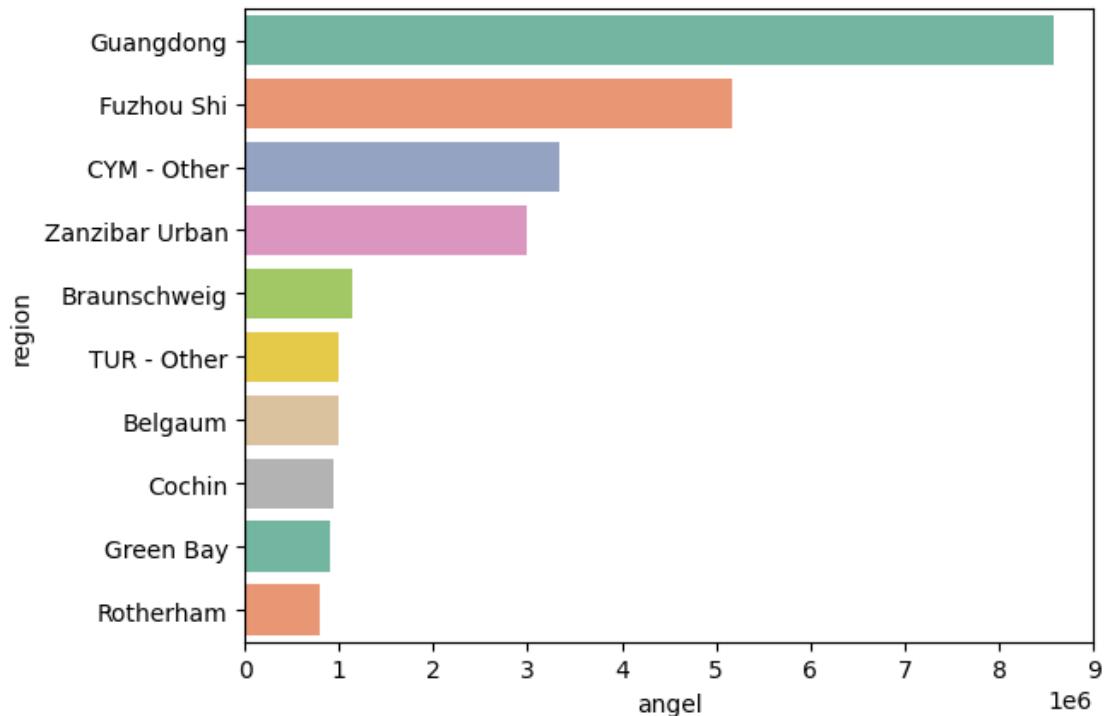
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='angel', ylabel='region'>
```



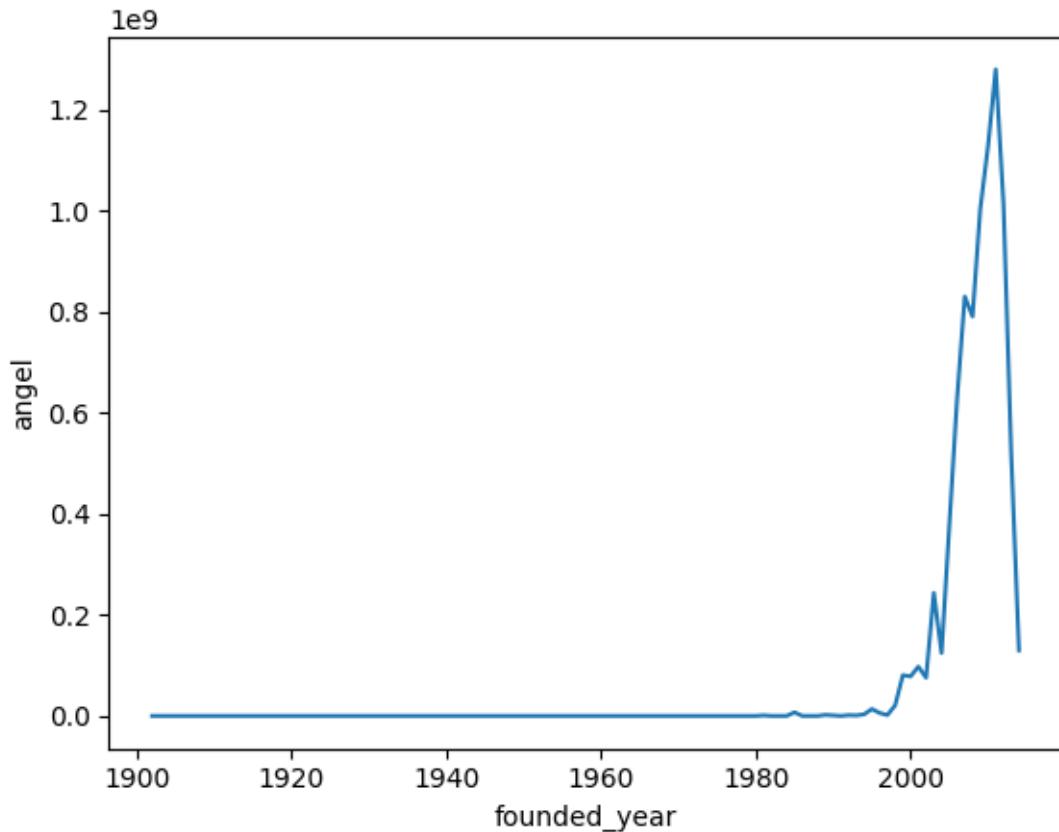
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'mean'}).reset_index()
      .sort_values(column, ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='angel', ylabel='region'>
```

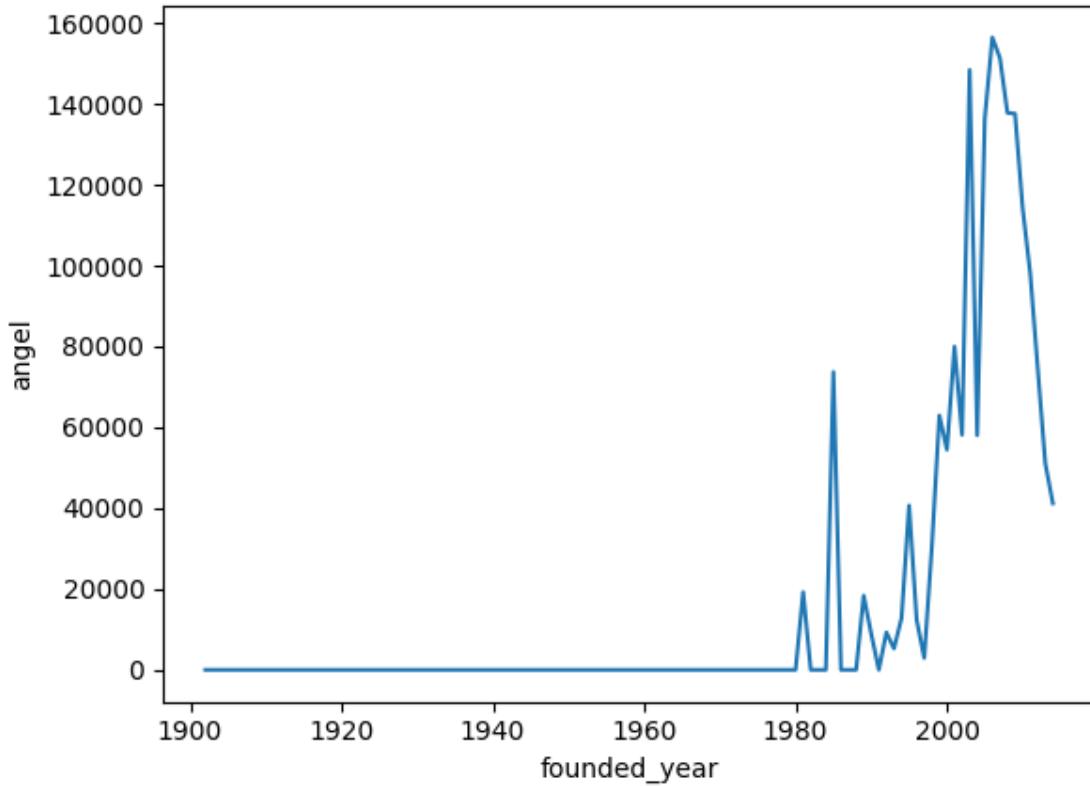


```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'sum'}).reset_index().  
     ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='angel'>
```

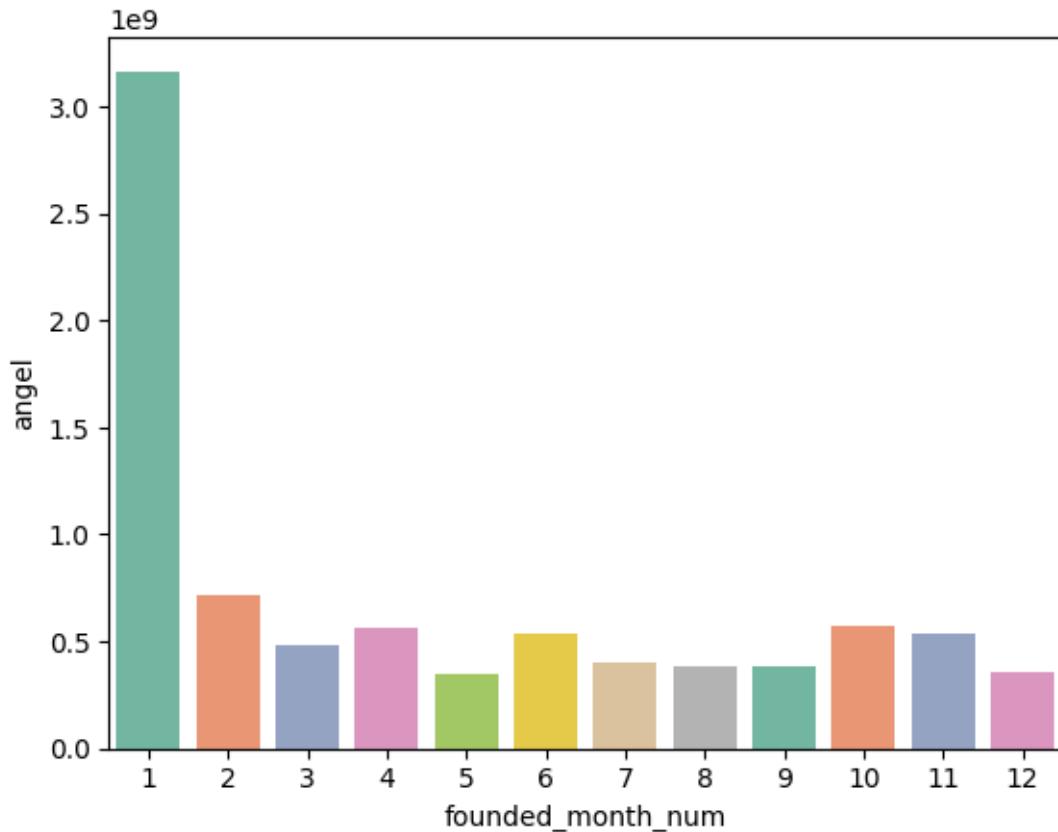


```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'mean'}).reset_index().  
      ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])  
  
[ ]: <Axes: xlabel='founded_year', ylabel='angel'>
```



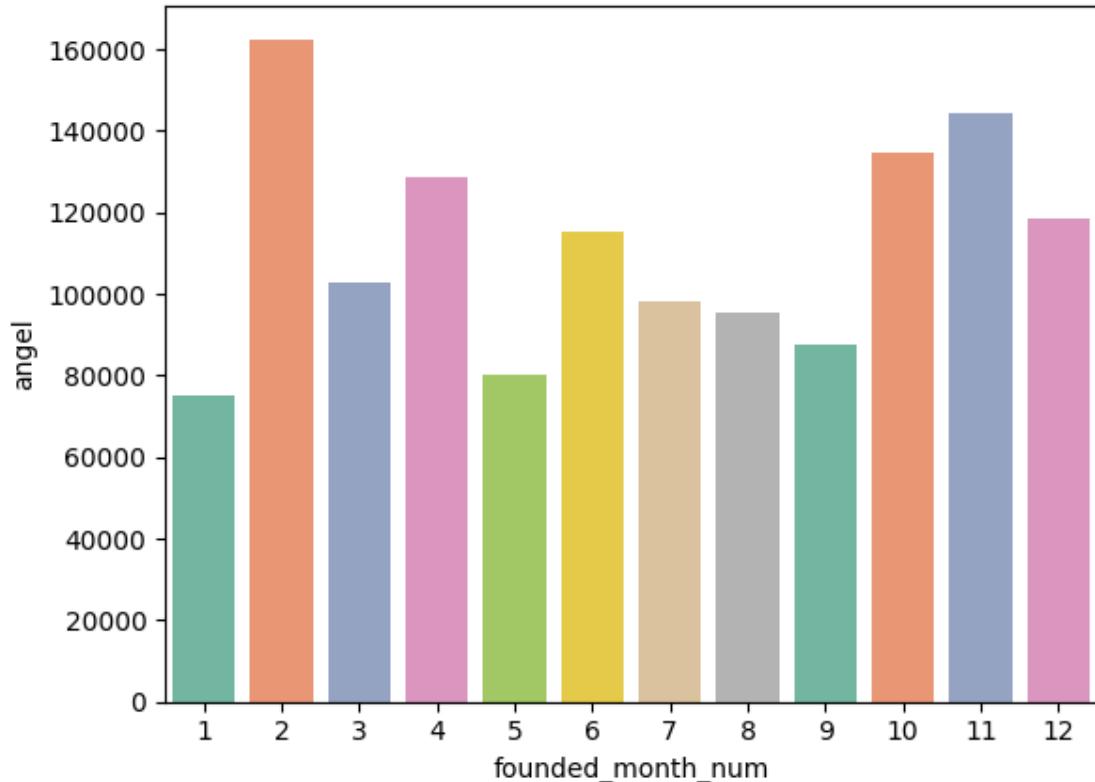
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'sum'}).
    ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='angel'>
```



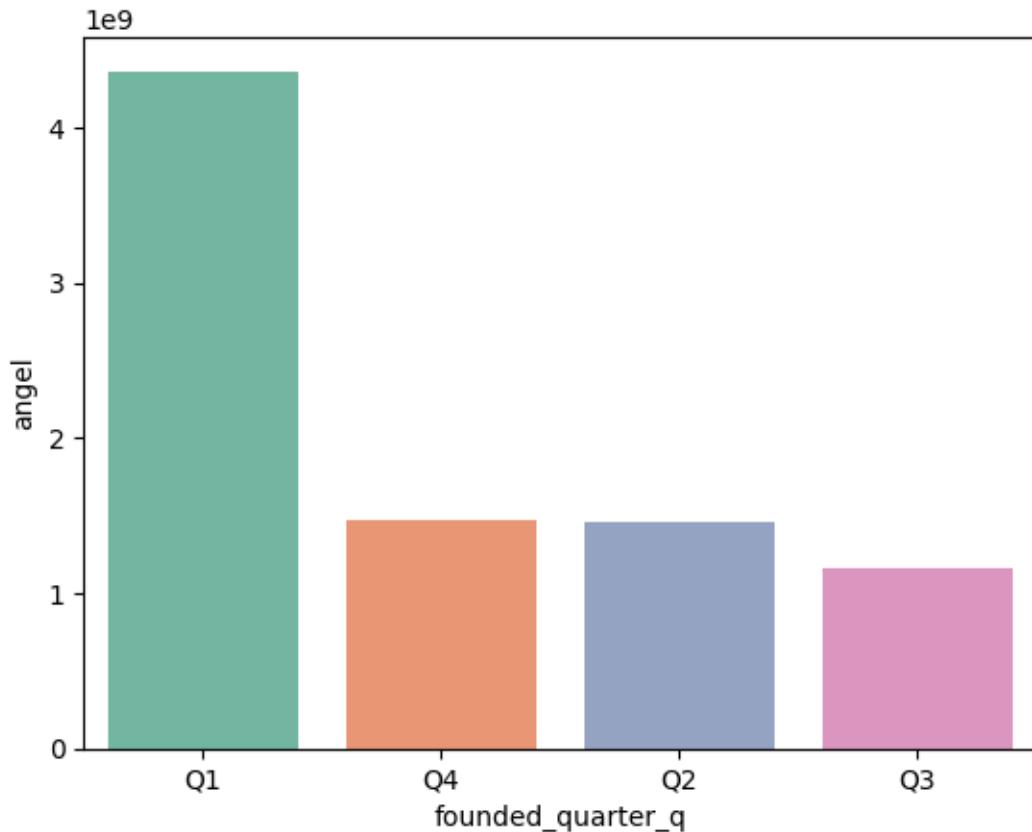
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='angel'>
```



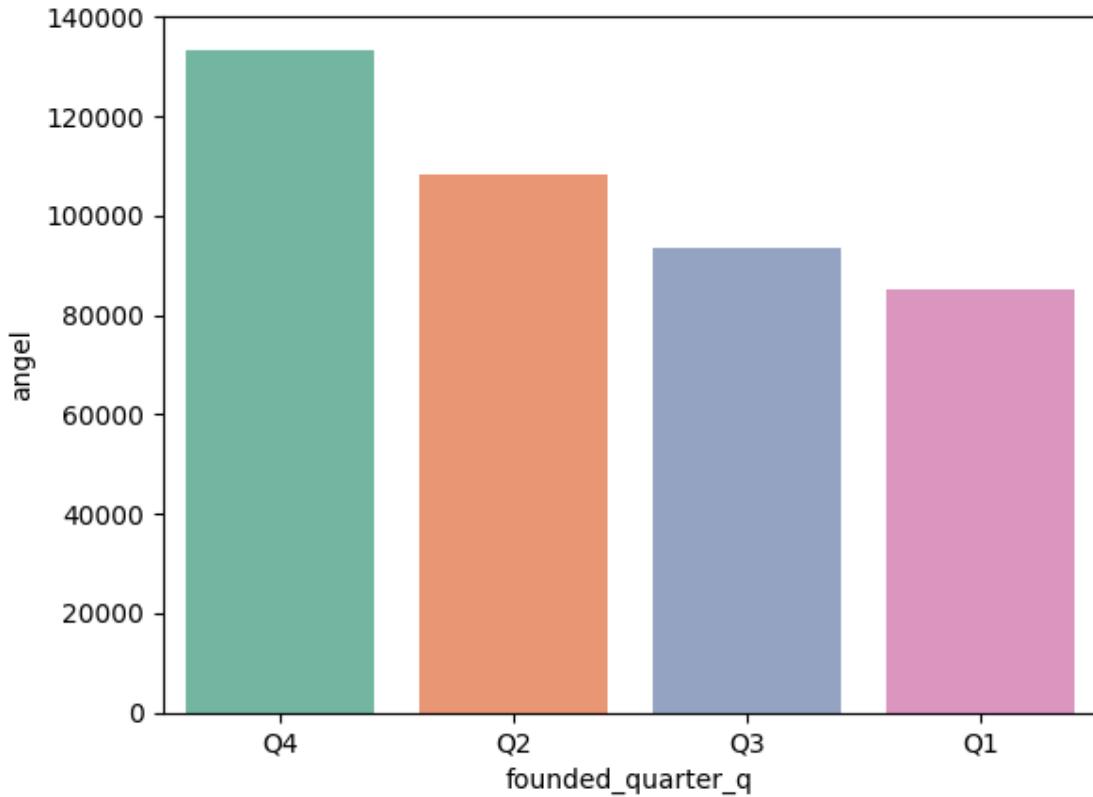
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'sum'}).
    ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q']!= 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='angel'>
```



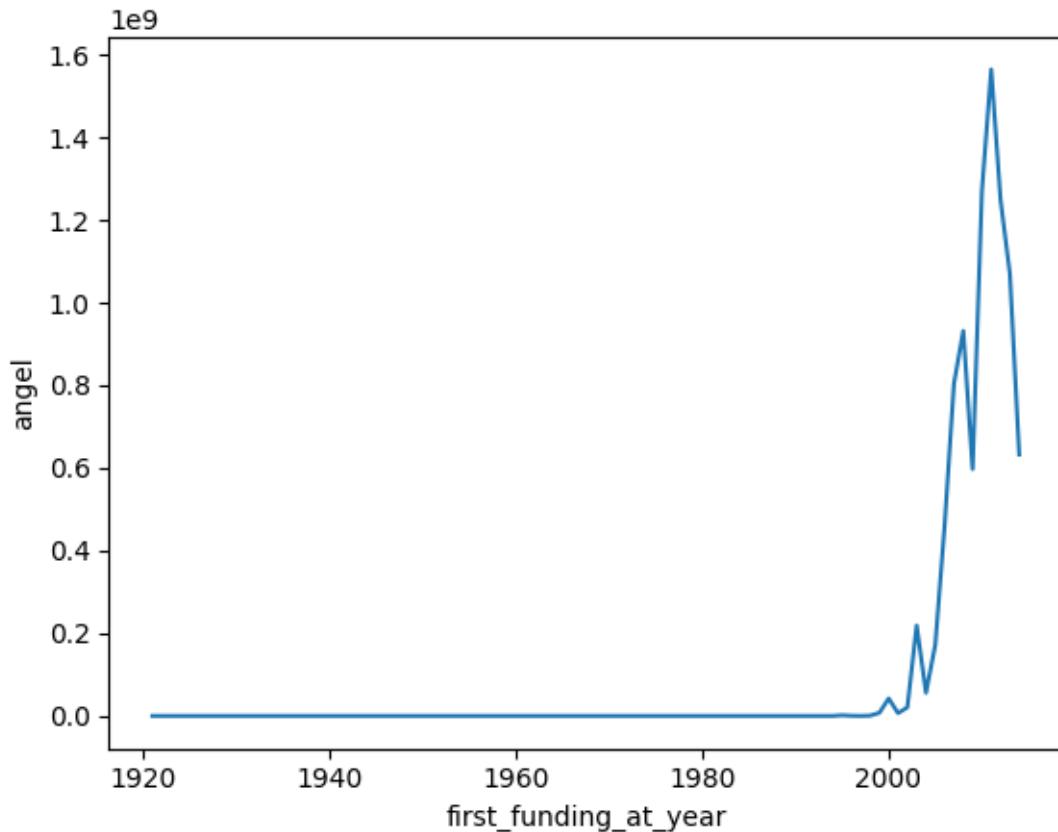
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'mean'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']  
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='angel'>
```



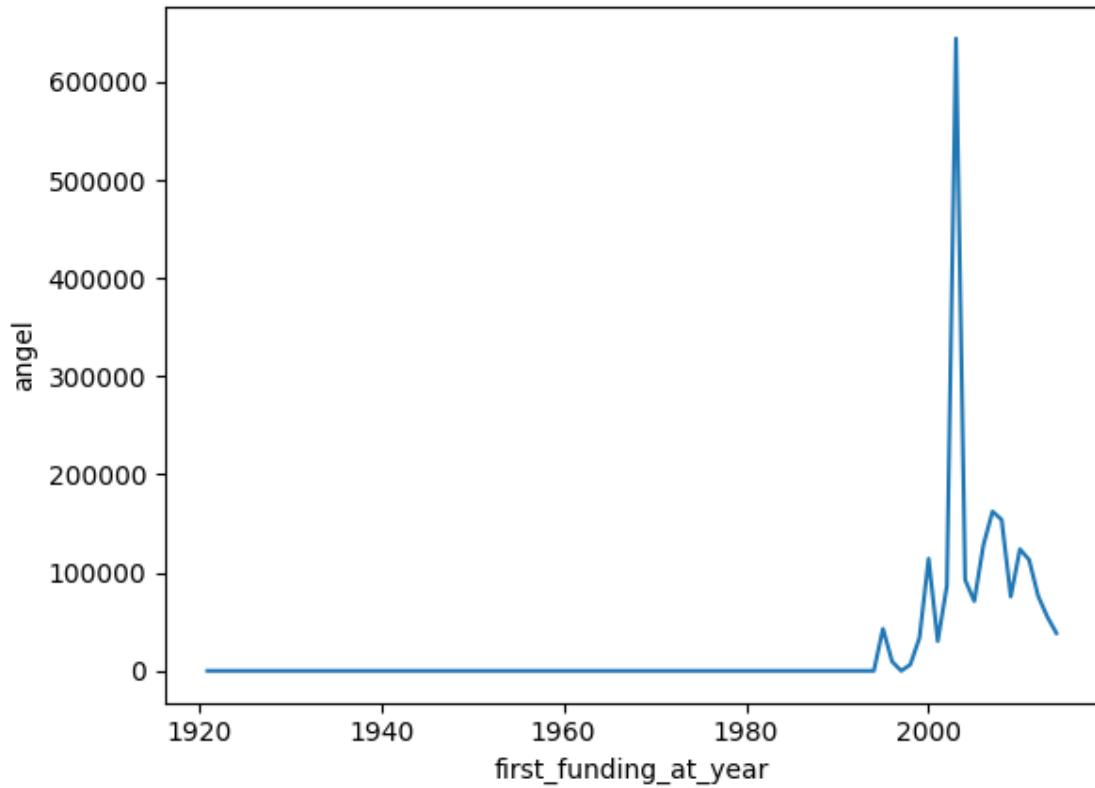
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='angel'>
```



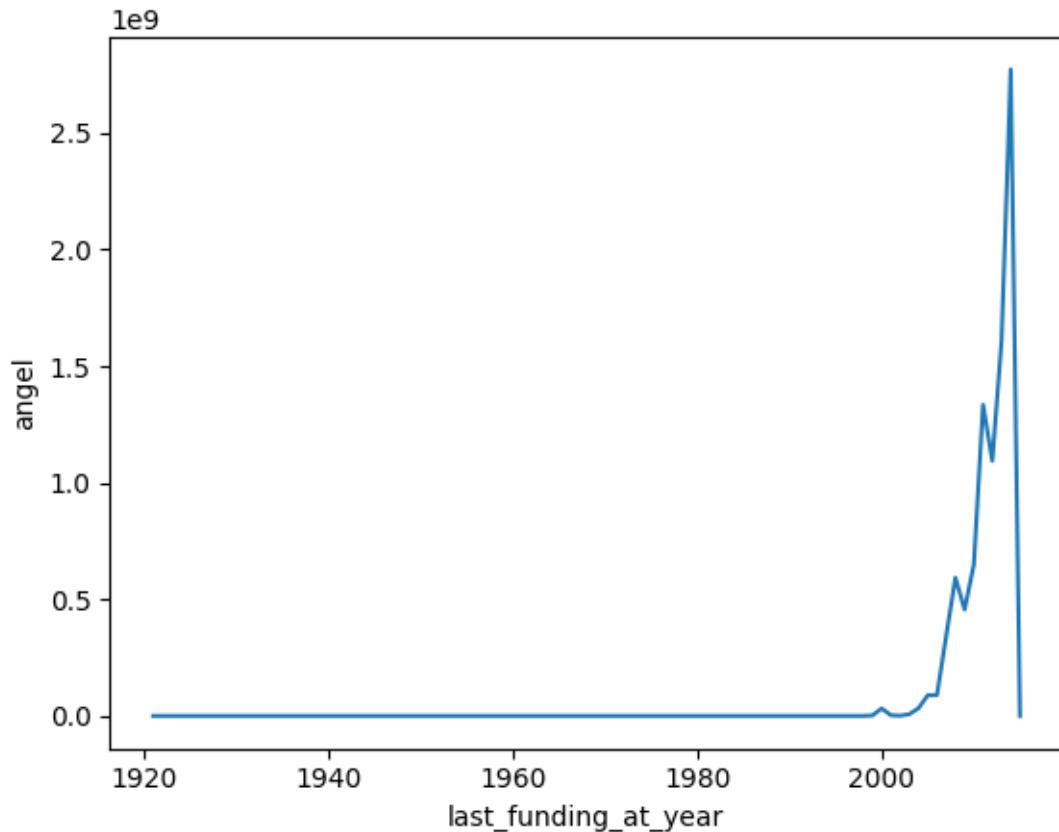
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='angel'>
```



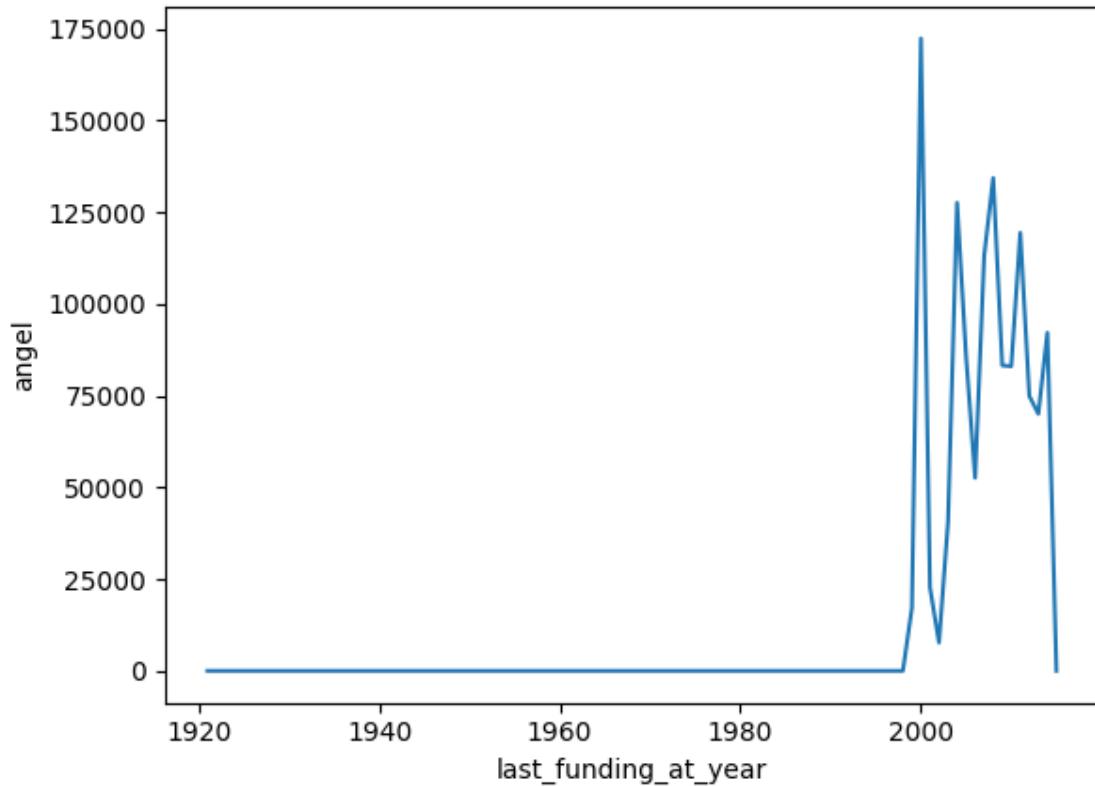
```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='angel'>
```



```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='angel'>
```



## 1.12 Grant Funds

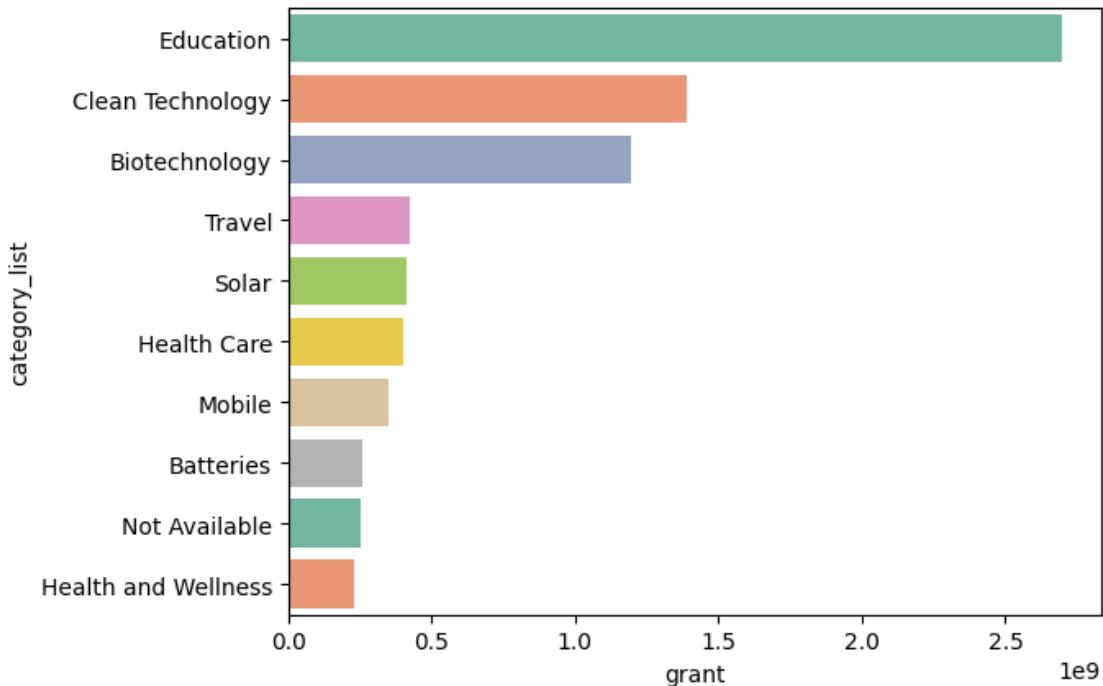
1. Grant funding is a financial award given to an individual or organization by a government, foundation, corporation, or other organization for a specific purpose.
2. Grants are different from loans because they do not need to be repaid.

Average and Total Analysis of the Grant Funds as shown below.

```
[ ]: column = 'grant'

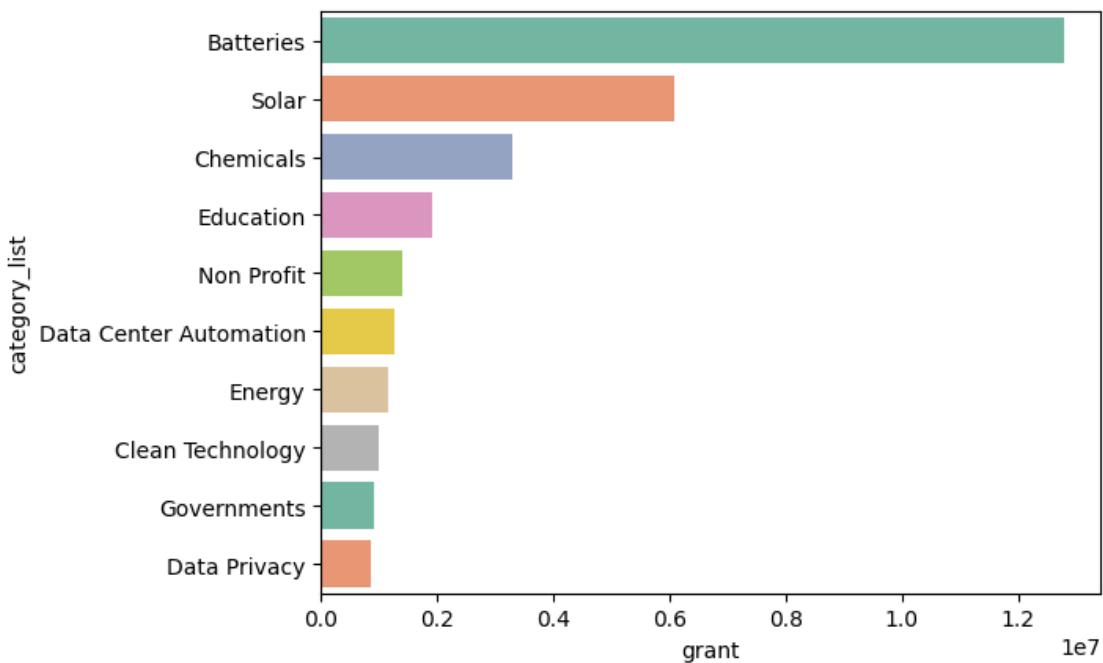
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'sum'}).reset_index().
    ↪sort_values(column,ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')

[ ]: <Axes: xlabel='grant', ylabel='category_list'>
```



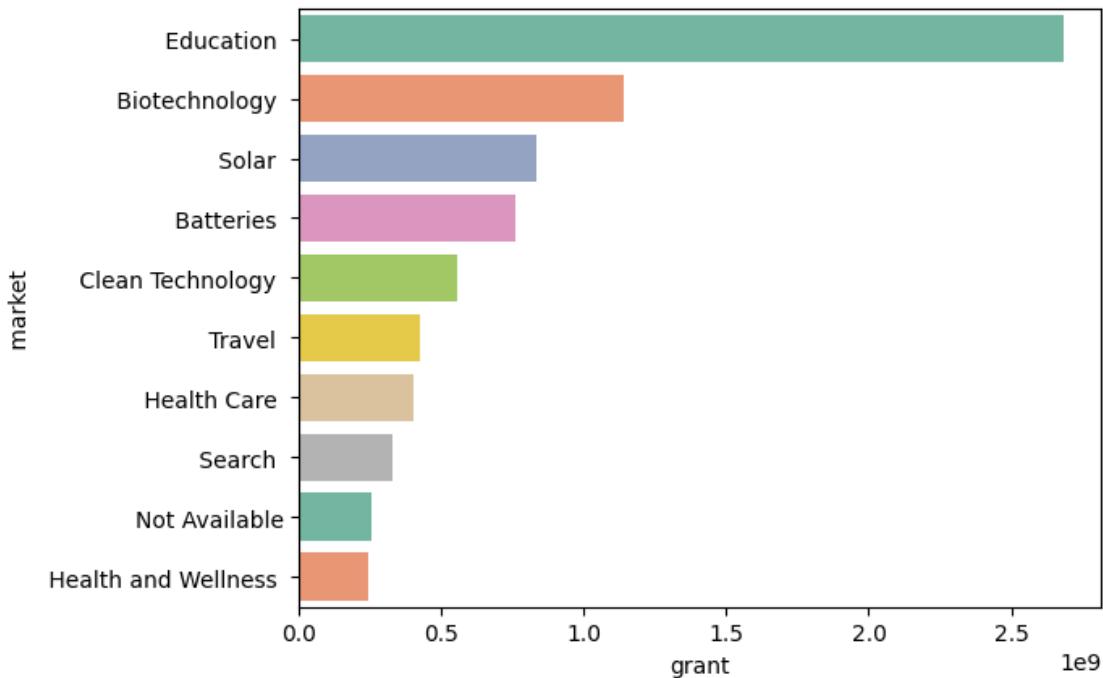
```
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'mean'}).reset_index()
      .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')
```

```
[ ]: <Axes: xlabel='grant', ylabel='category_list'>
```



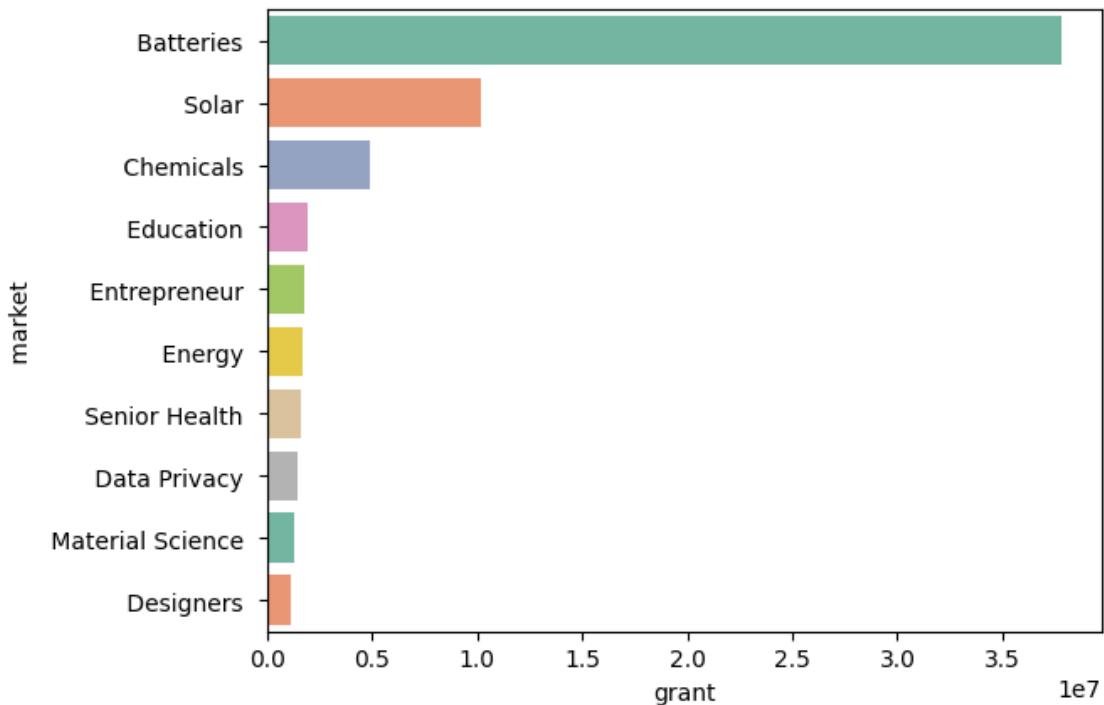
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'sum'}).reset_index() .  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='grant', ylabel=' market '>
```



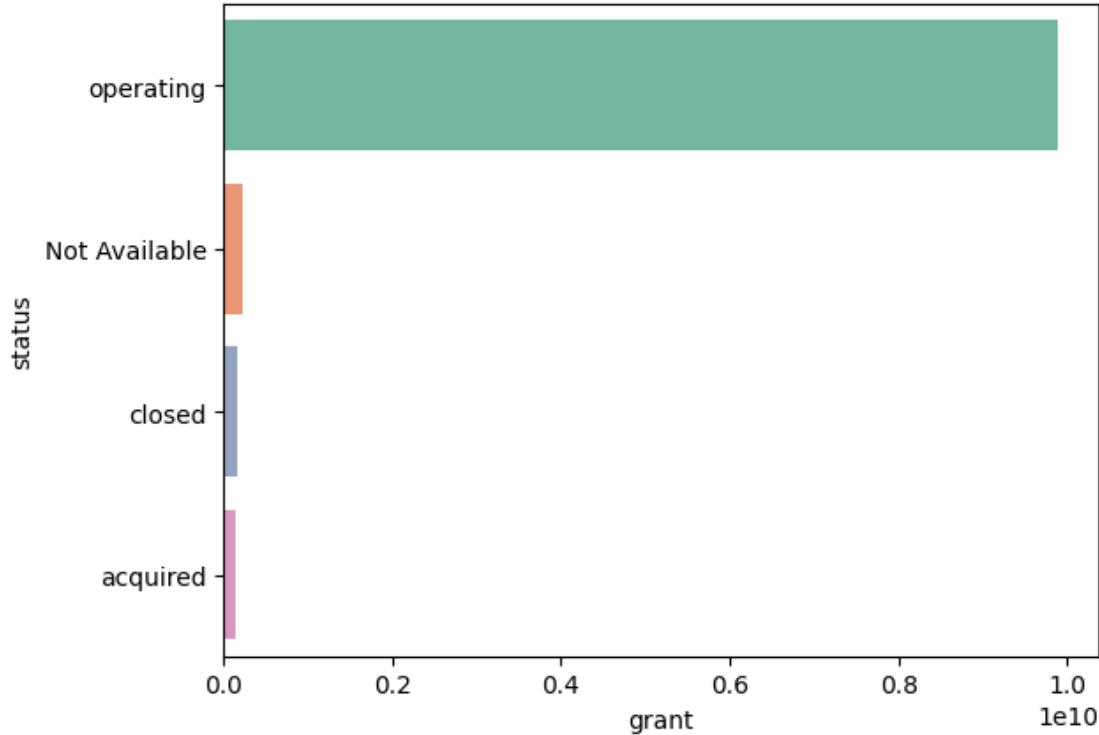
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='grant', ylabel=' market '>
```



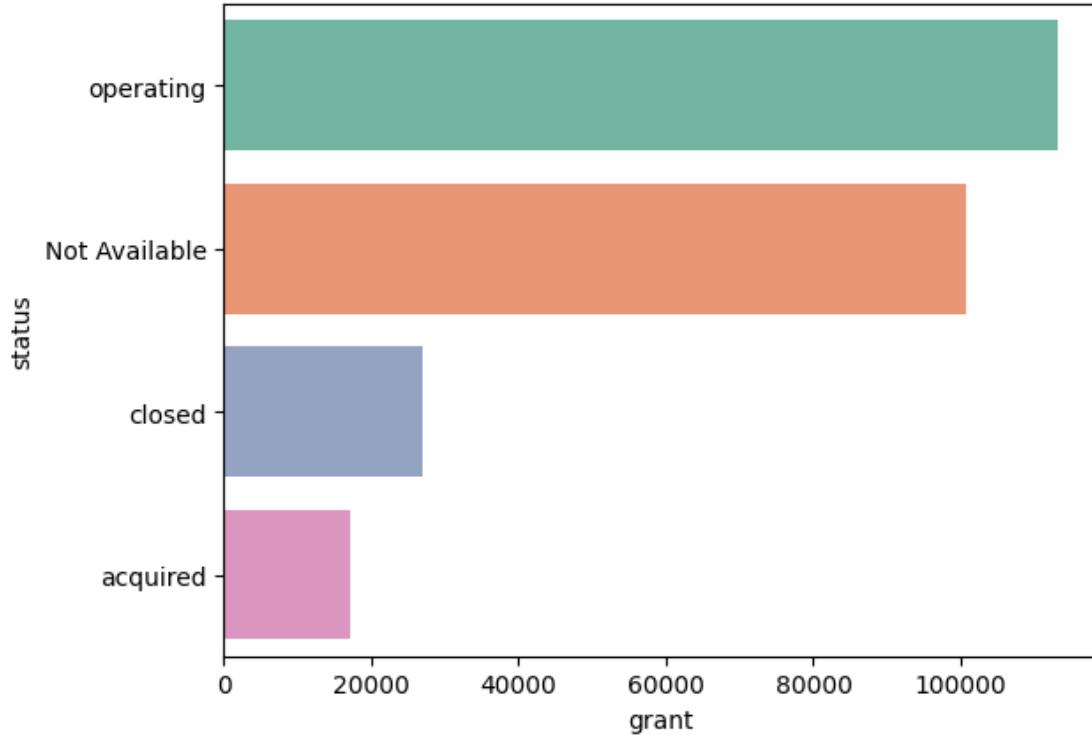
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'sum'}).reset_index().  
     ↪sort_values(column, ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='grant', ylabel='status'>
```



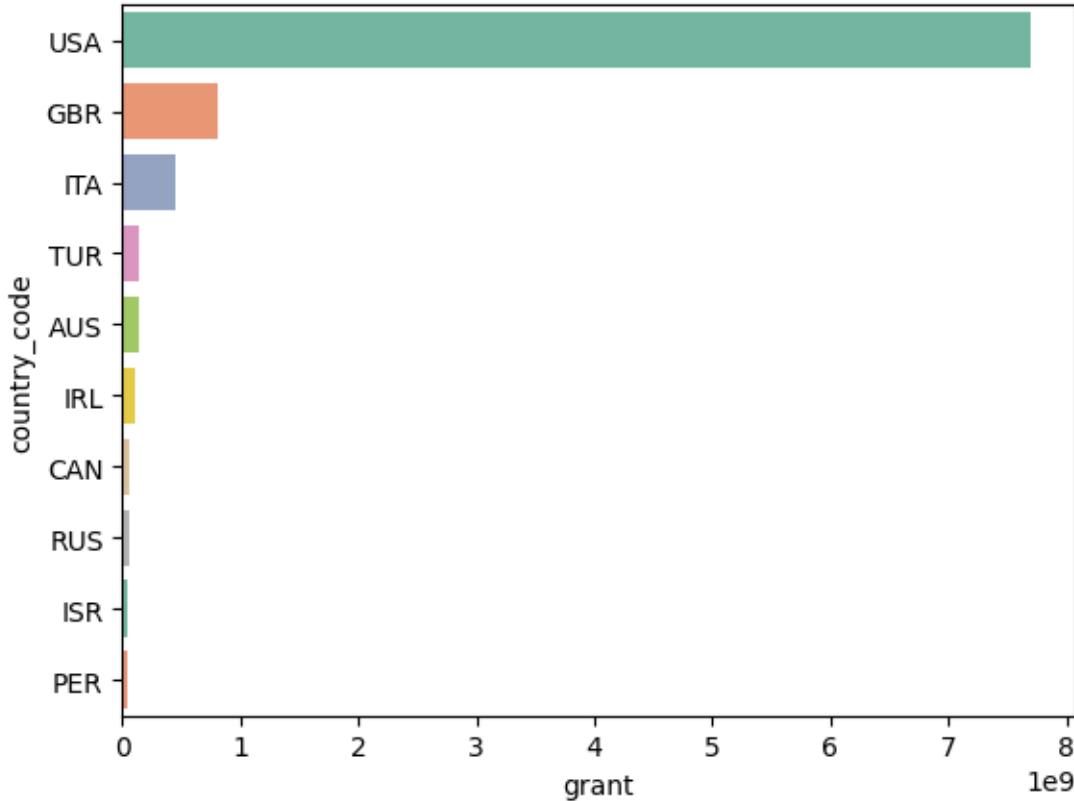
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'mean'}).reset_index()
      .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='grant', ylabel='status'>
```



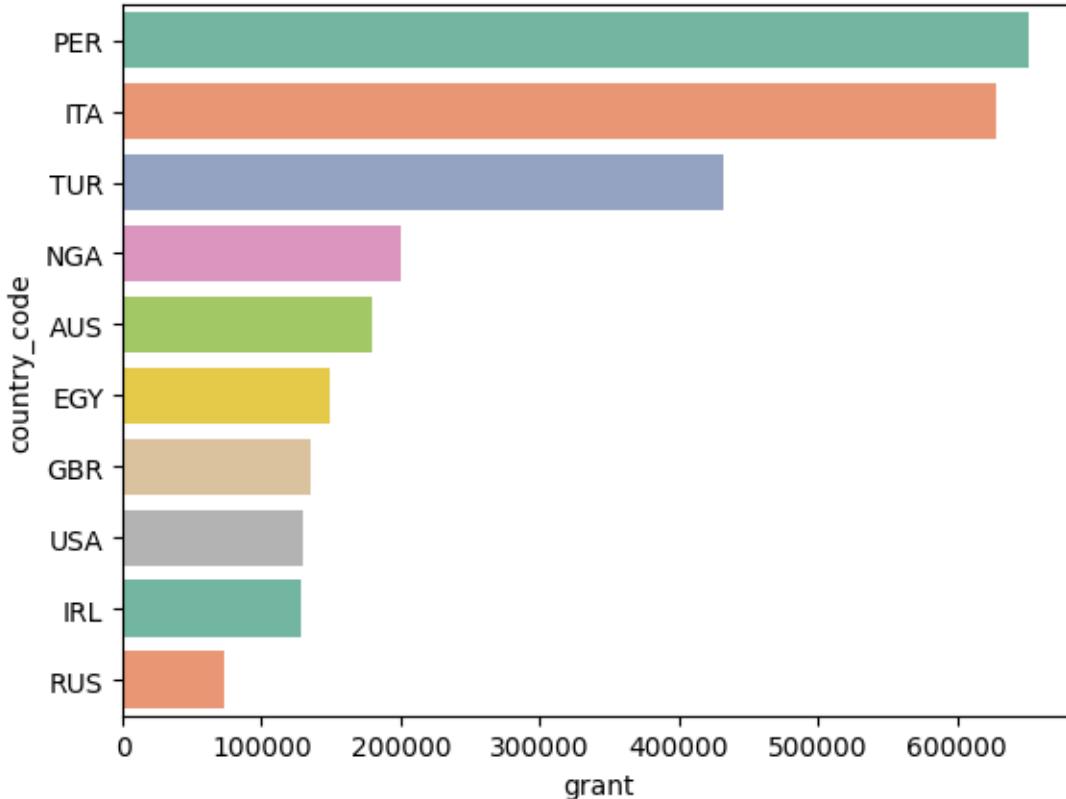
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column,ascending=False).head(11)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='grant', ylabel='country_code'>
```



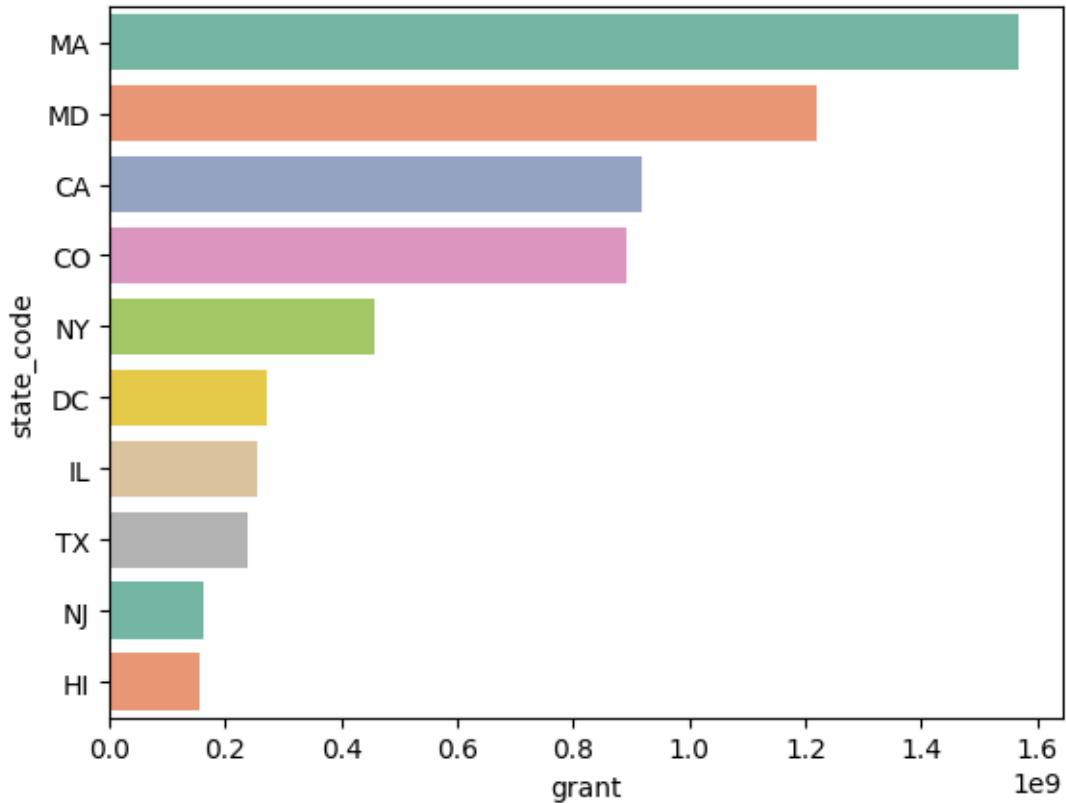
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='grant', ylabel='country_code'>
```



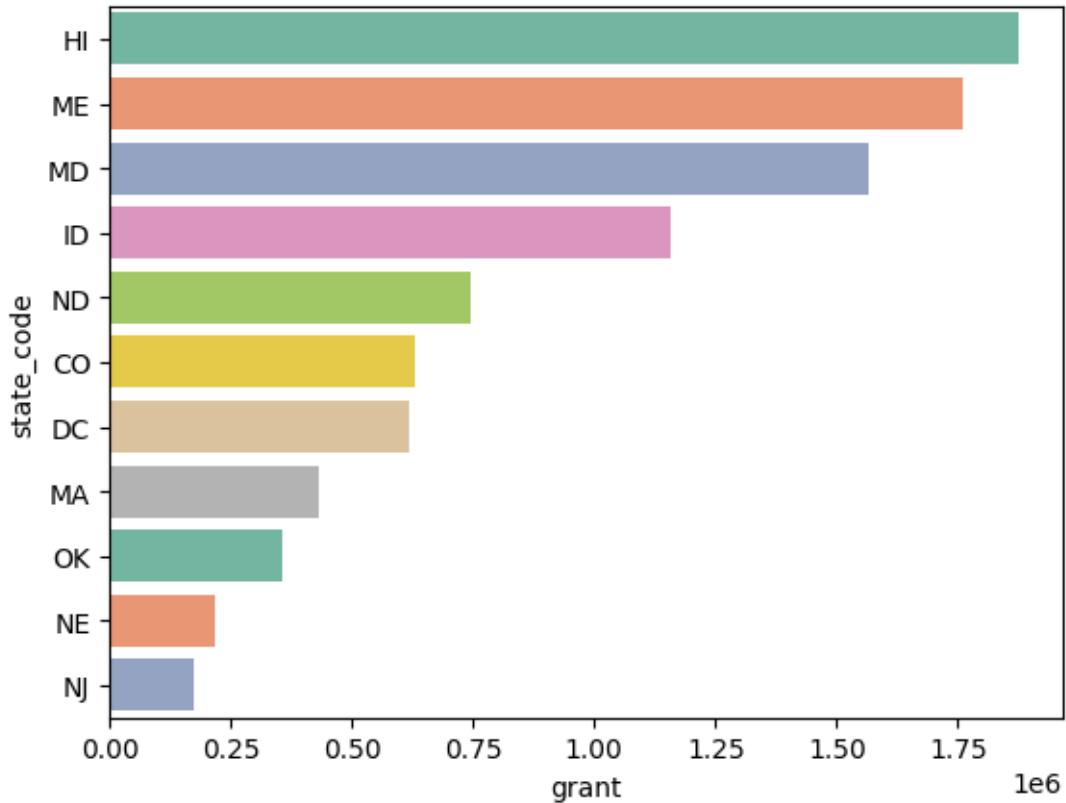
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='grant', ylabel='state_code'>
```



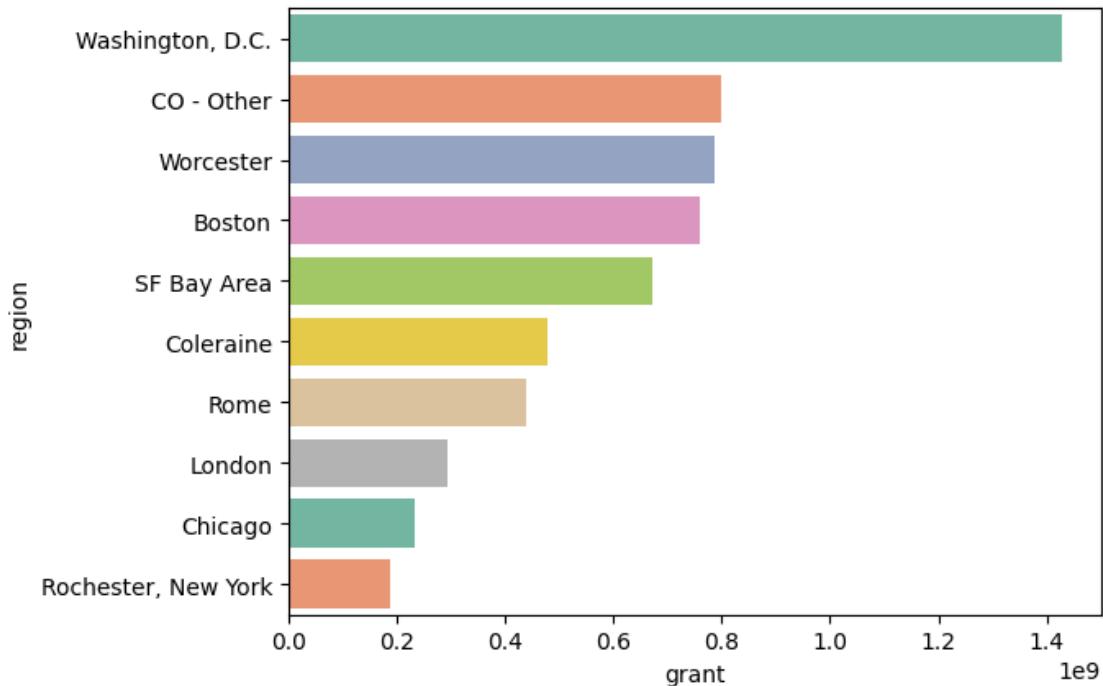
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='grant', ylabel='state_code'>
```



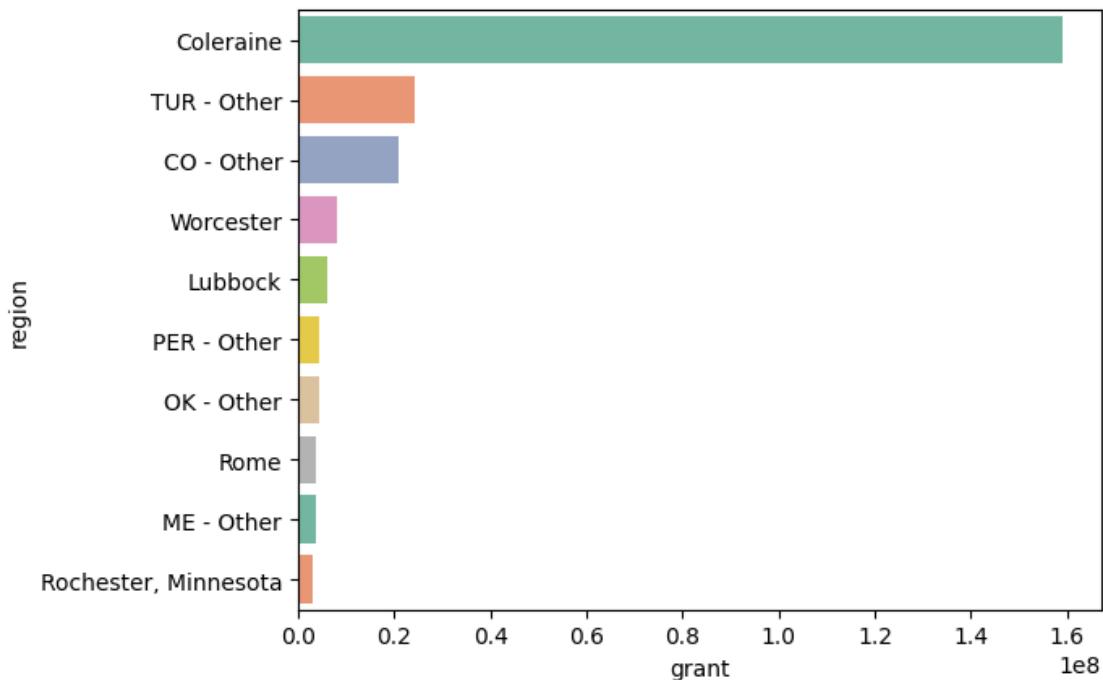
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='grant', ylabel='region'>
```



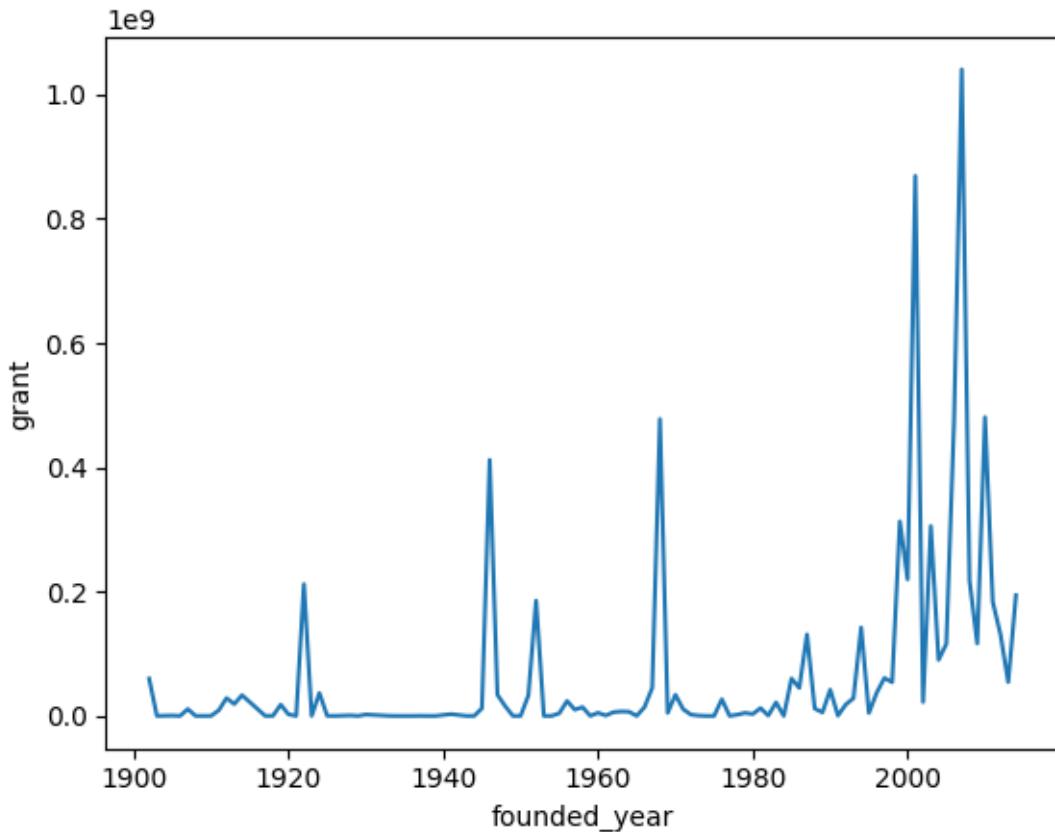
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'mean'}).reset_index()
     ↪sort_values(column, ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='grant', ylabel='region'>
```



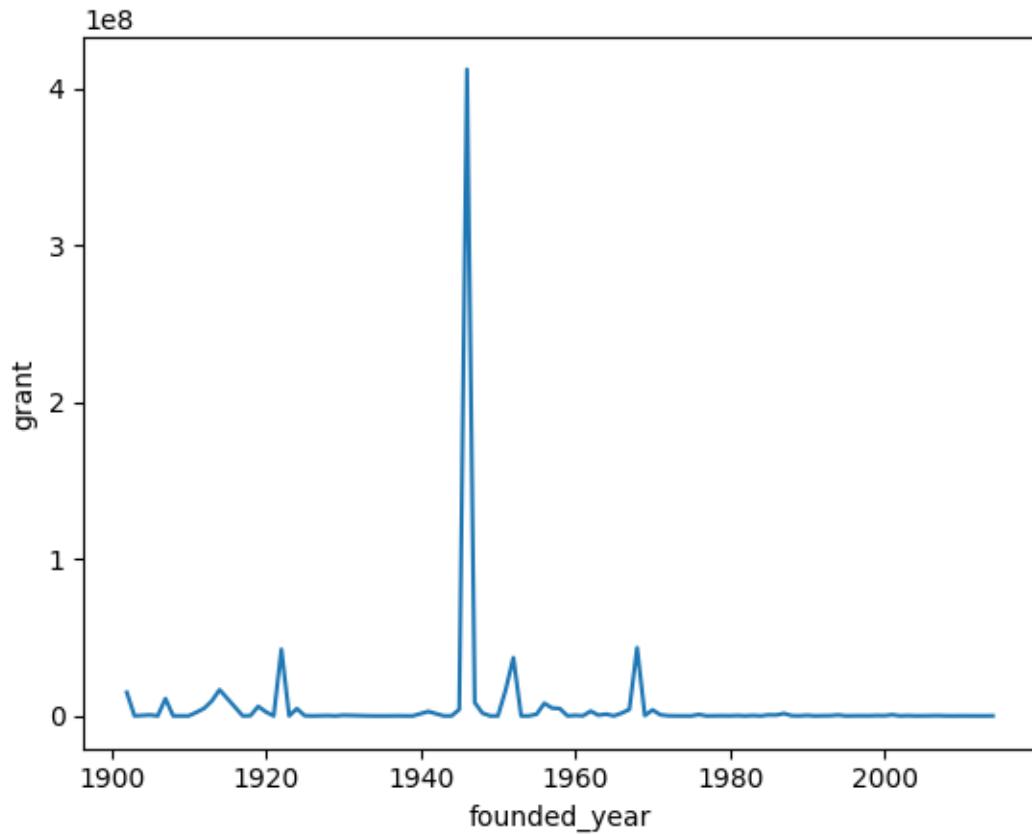
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'sum'}).reset_index().
    ↪sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='grant'>
```



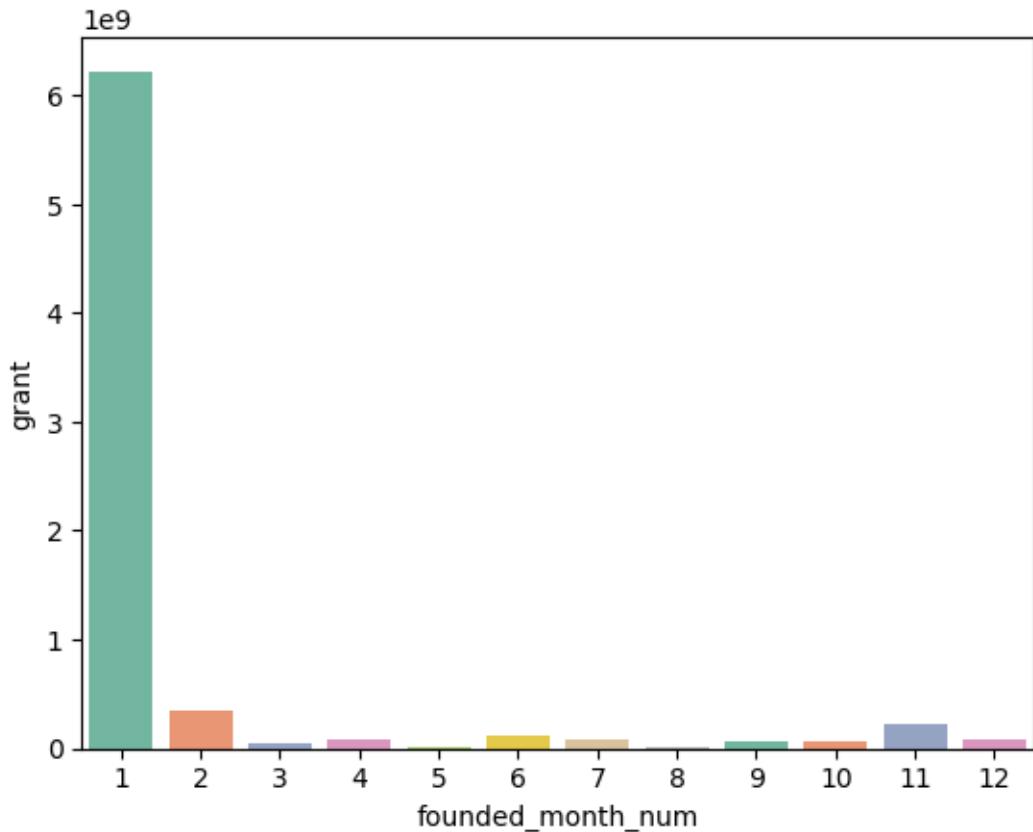
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'mean'}).reset_index().  
      ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='grant'>
```



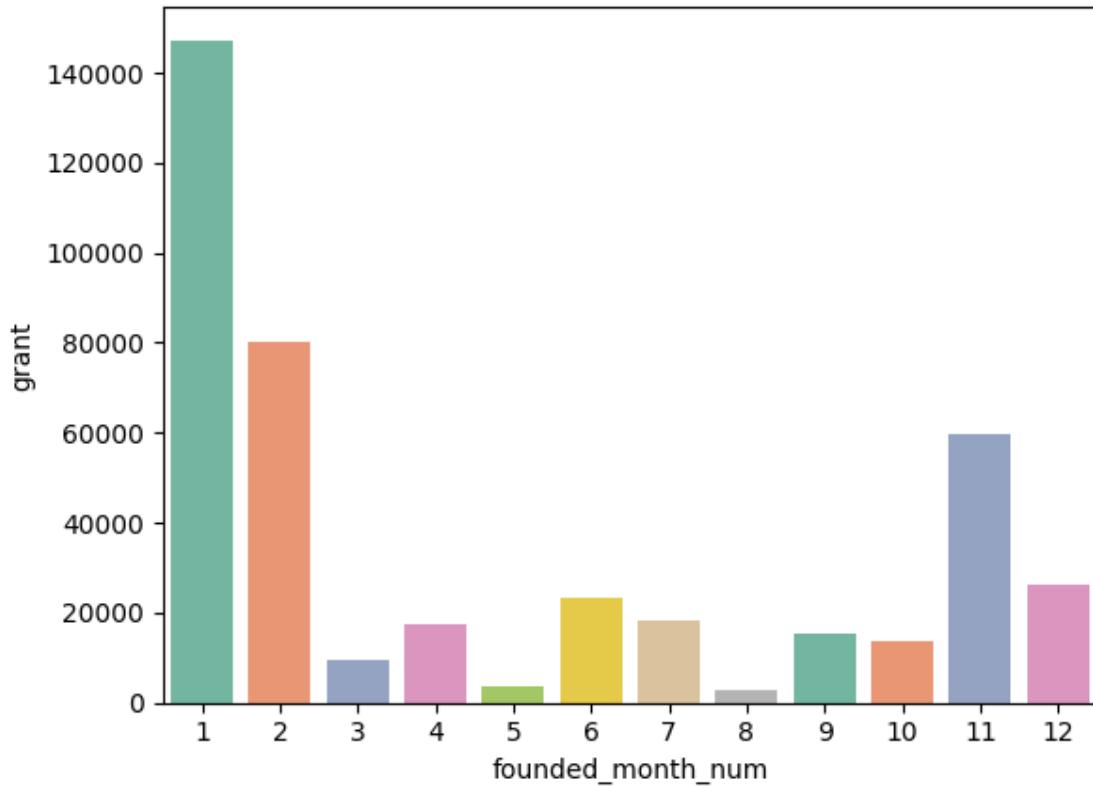
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_month_num'] > 0]  
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='grant'>
```



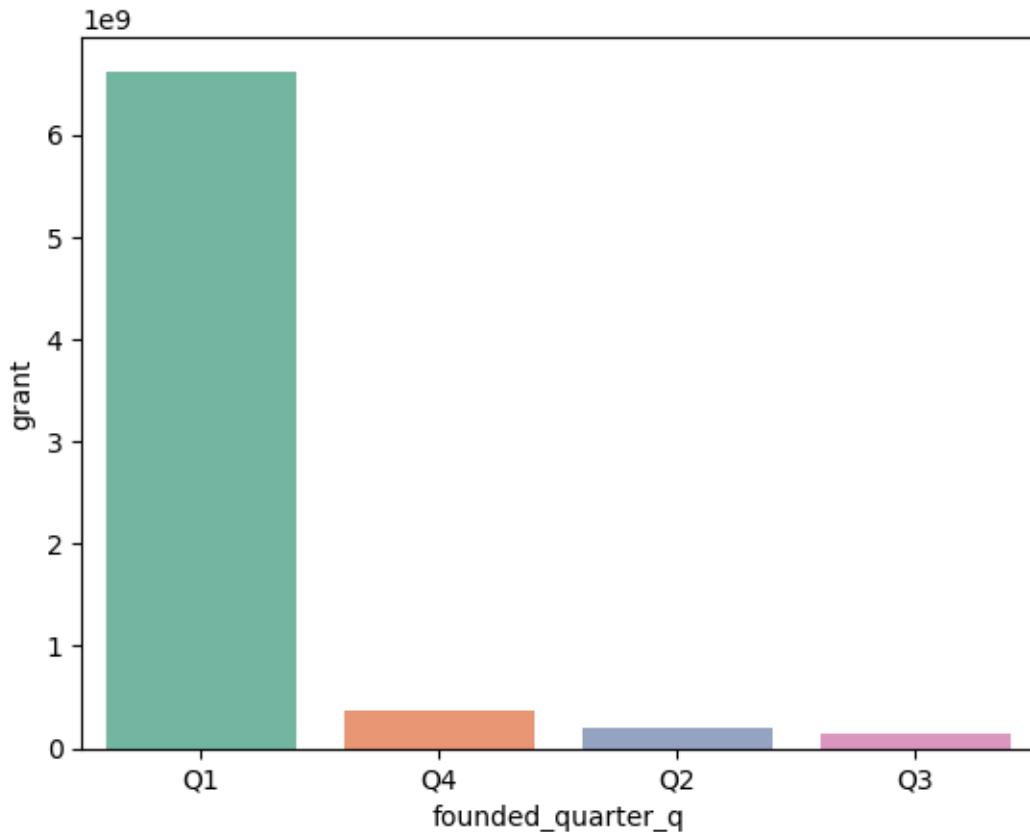
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='grant'>
```



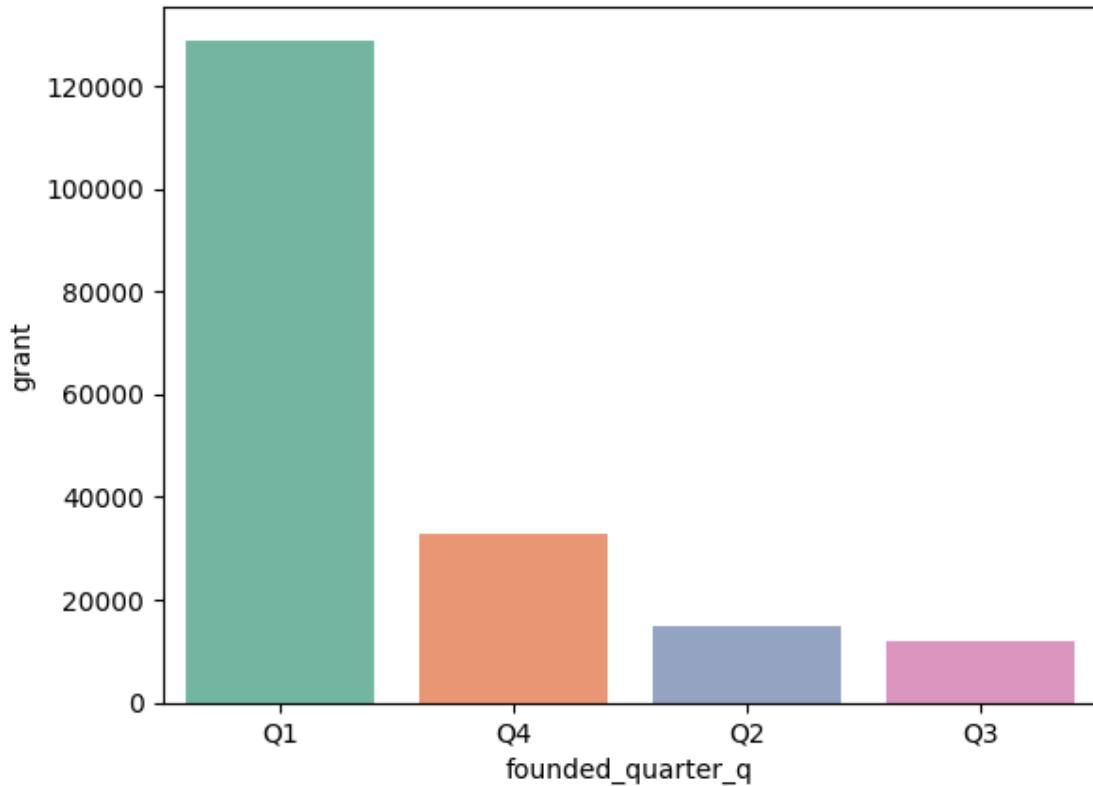
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'sum'}).
    ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q']!='Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')

[ ]: <Axes: xlabel='founded_quarter_q', ylabel='grant'>
```



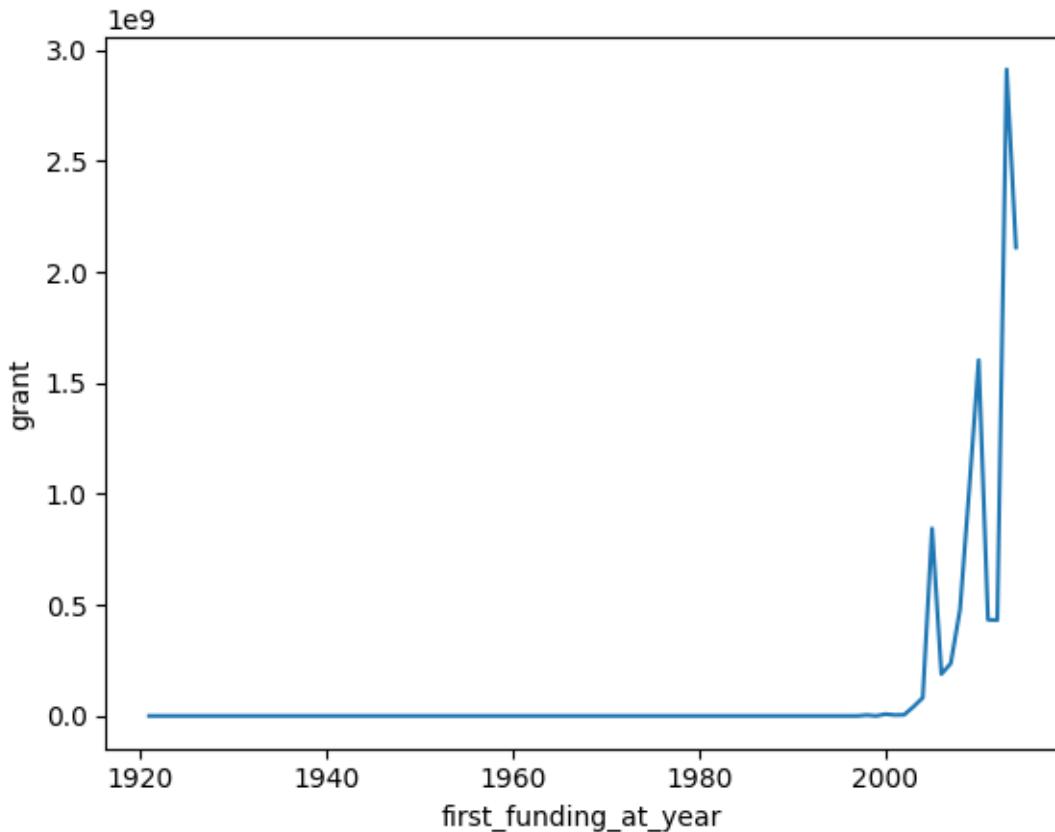
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'mean'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']  
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='grant'>
```



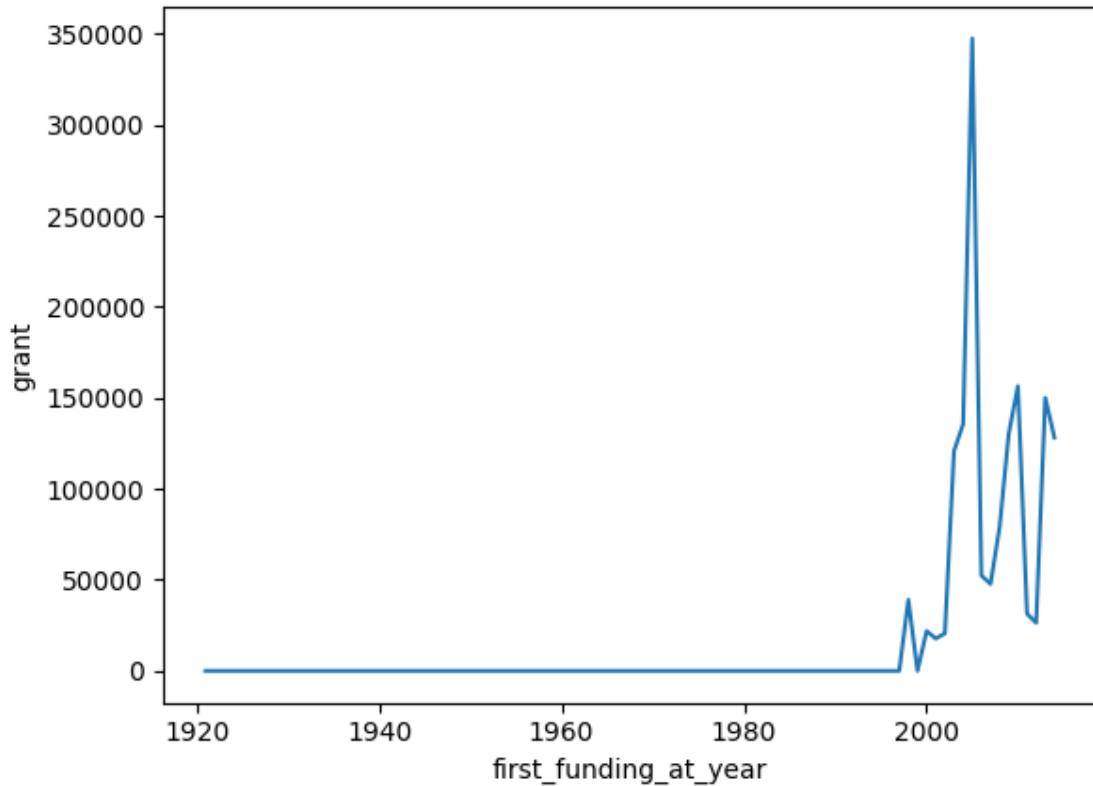
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='grant'>
```



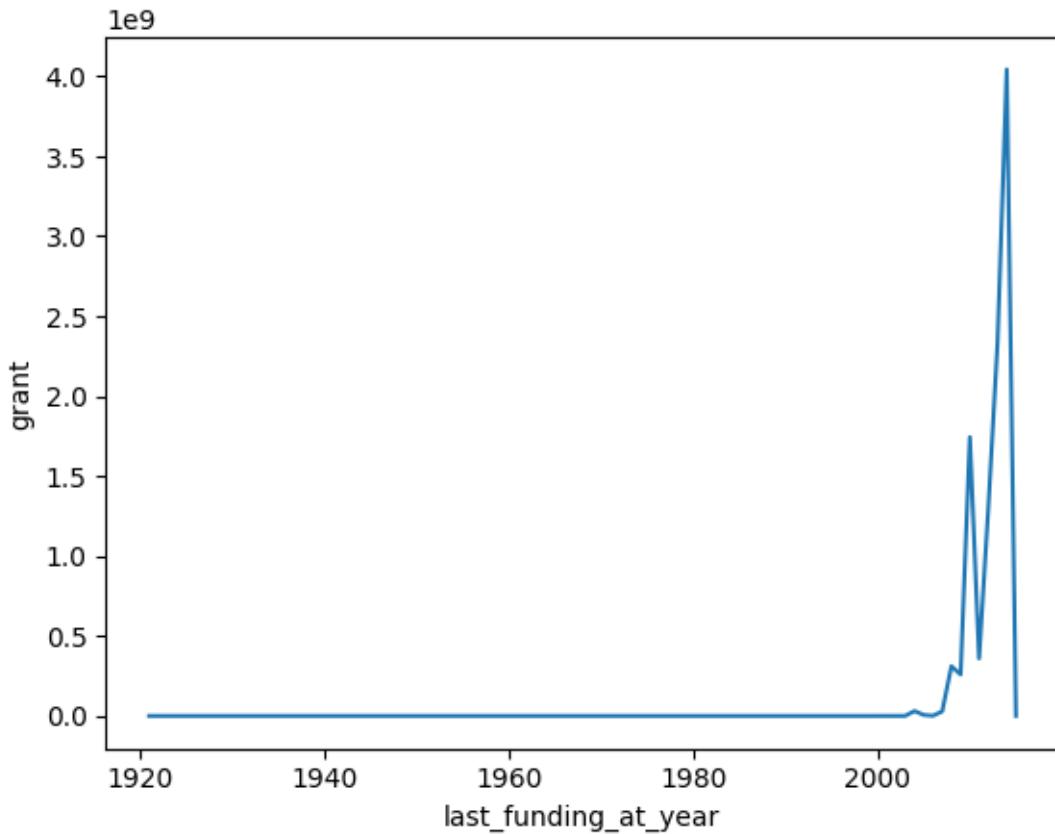
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='grant'>
```

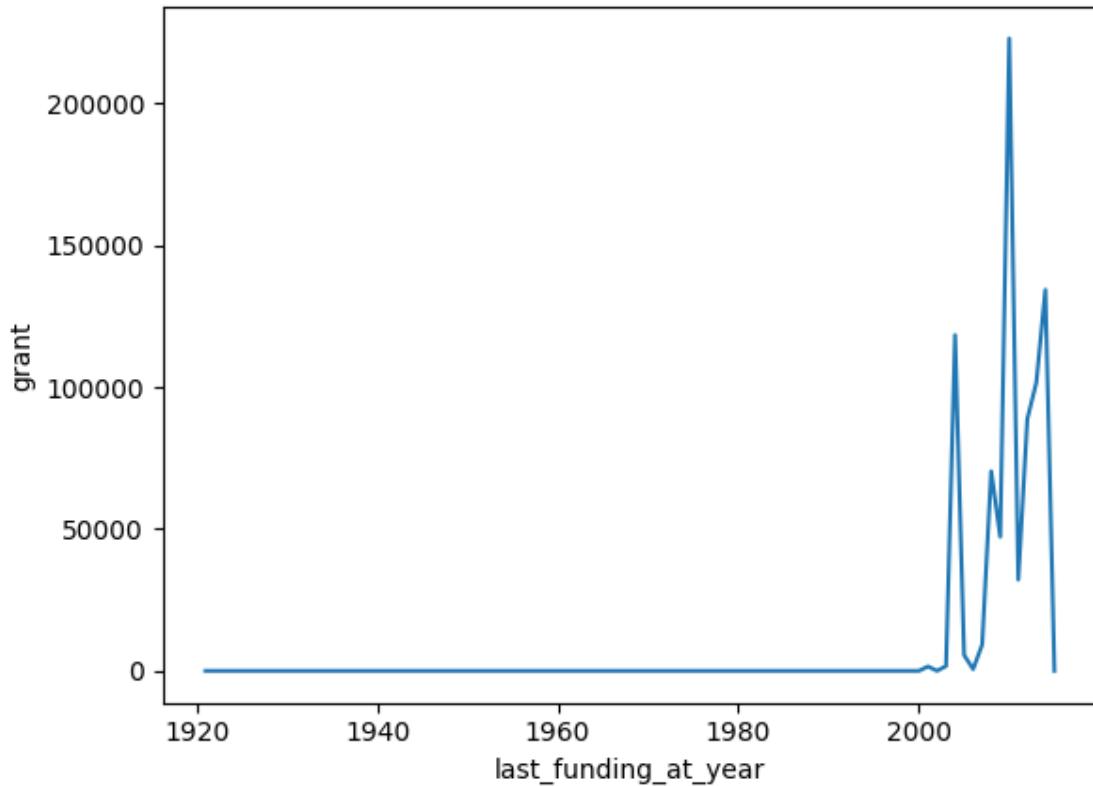


```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='grant'>
```



```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column,ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year']> 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])  
  
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='grant'>
```



### 1.13 Private Equity Funds

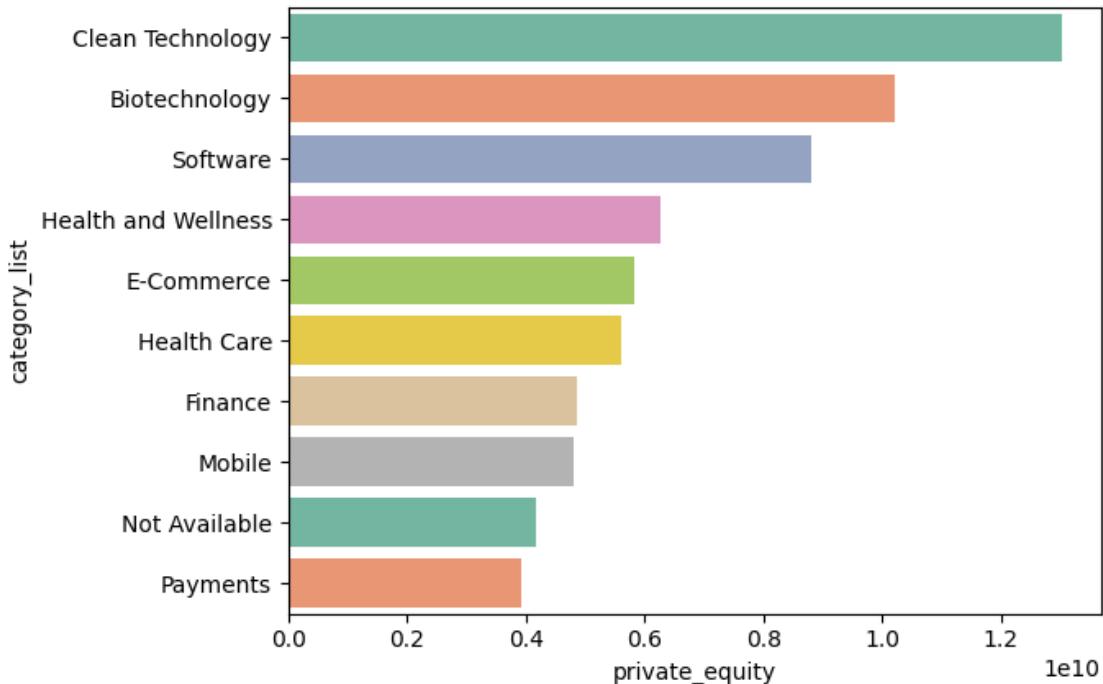
1. Private equity (PE) funding is a way to invest in private companies that are not publicly traded.
2. PE funds are pools of capital that are managed by a private equity firm, and investors contribute capital to become limited partners in the fund.

Average and Total Analysis of the Private Equity Funds as shown below.

```
[ ]: column = 'private_equity'

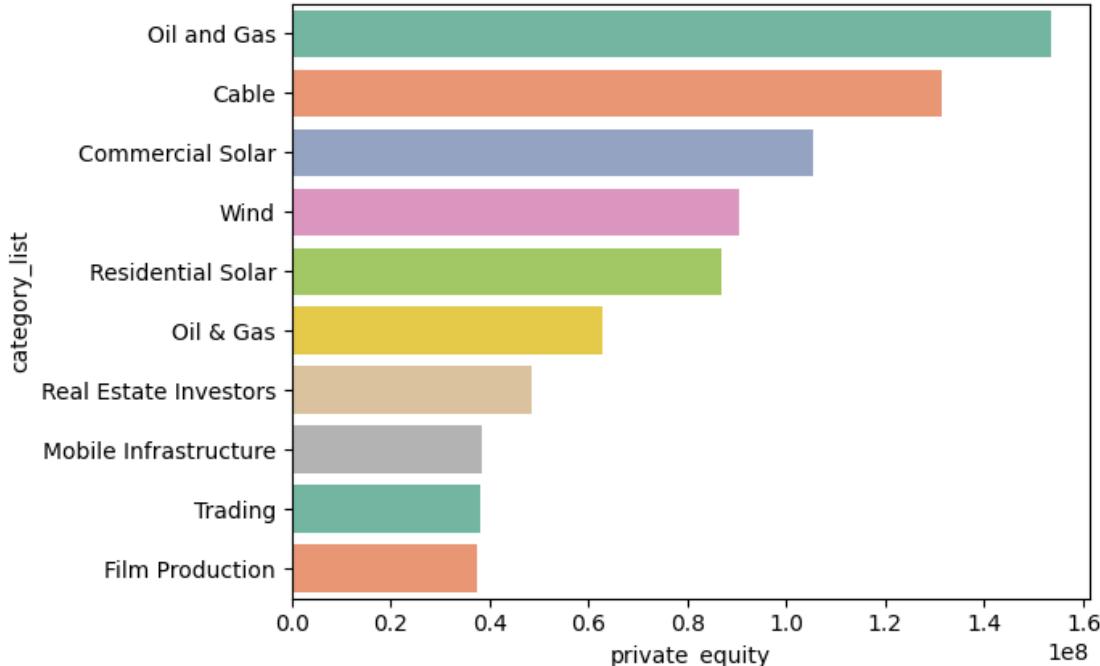
[ ]: df_plot = df_clean.groupby('category_list').agg({column: 'sum'}).reset_index()
     .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')

[ ]: <Axes: xlabel='private_equity', ylabel='category_list'>
```



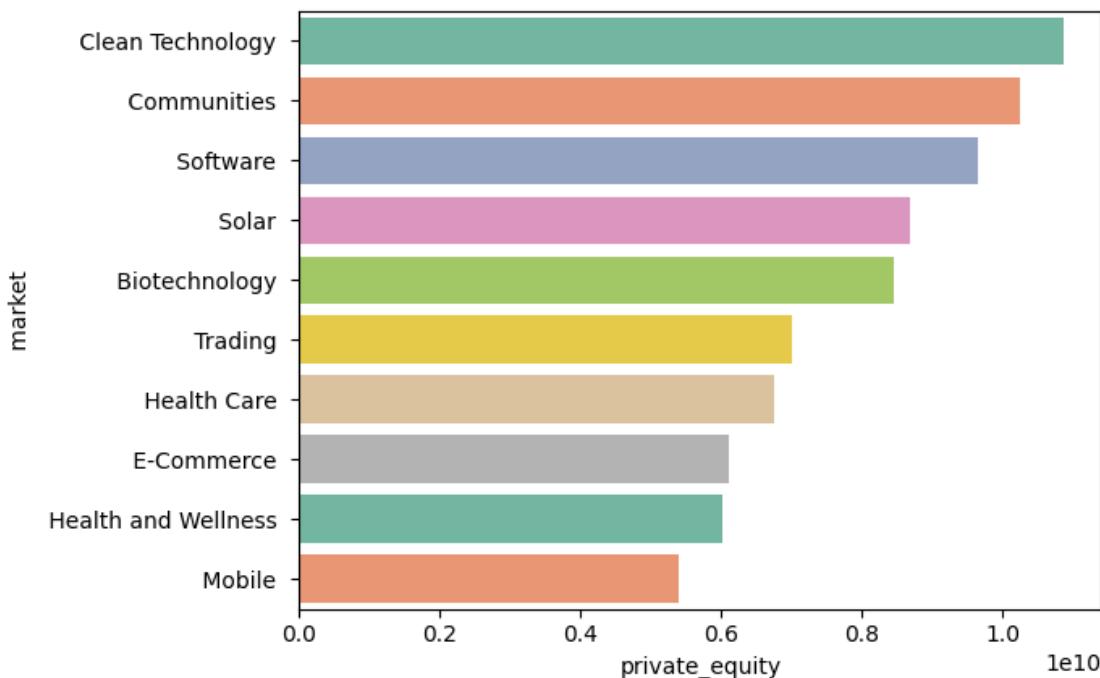
```
[ ]: df_plot = df_clean.groupby('category_list').agg({column: 'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')
```

```
[ ]: <Axes: xlabel='private_equity', ylabel='category_list'>
```



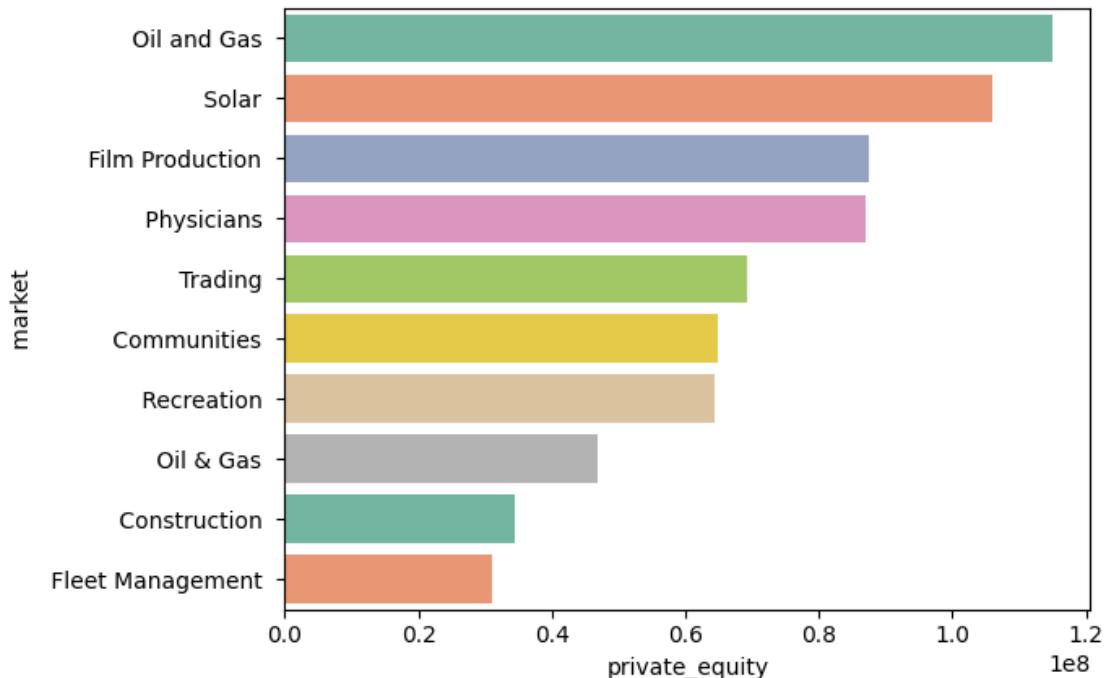
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'sum'}).reset_index() .
    ↪sort_values(column,ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='private_equity', ylabel=' market '>
```



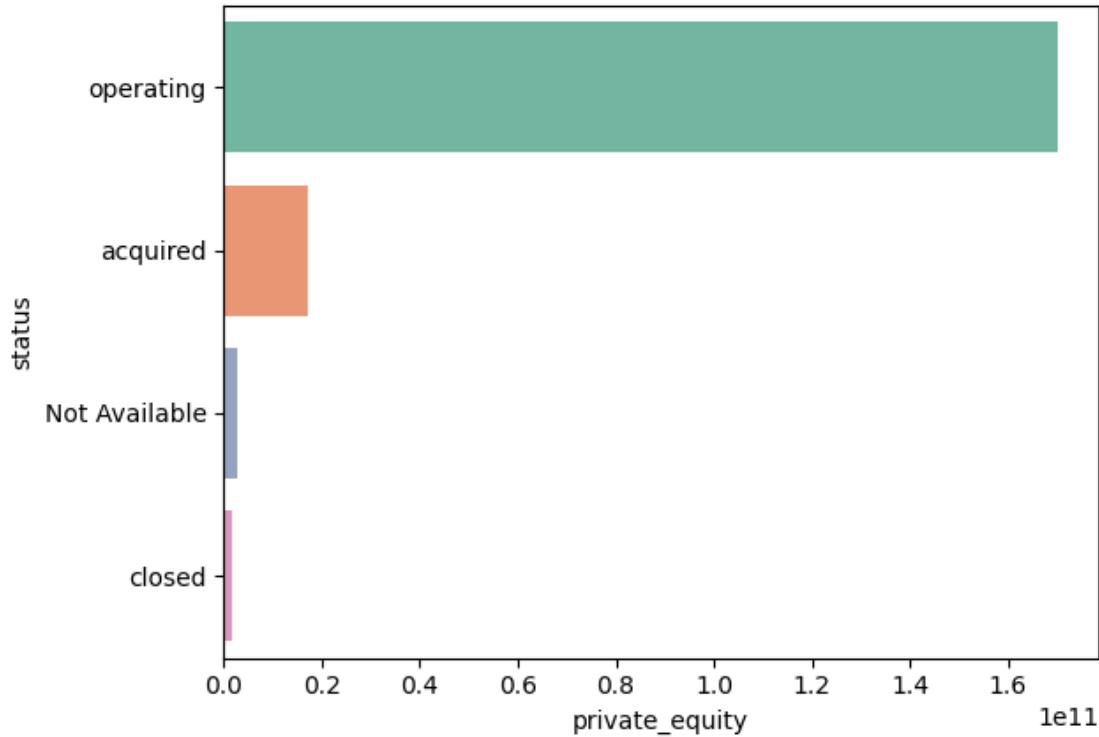
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'mean'}).reset_index().  
      ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='private_equity', ylabel=' market '>
```



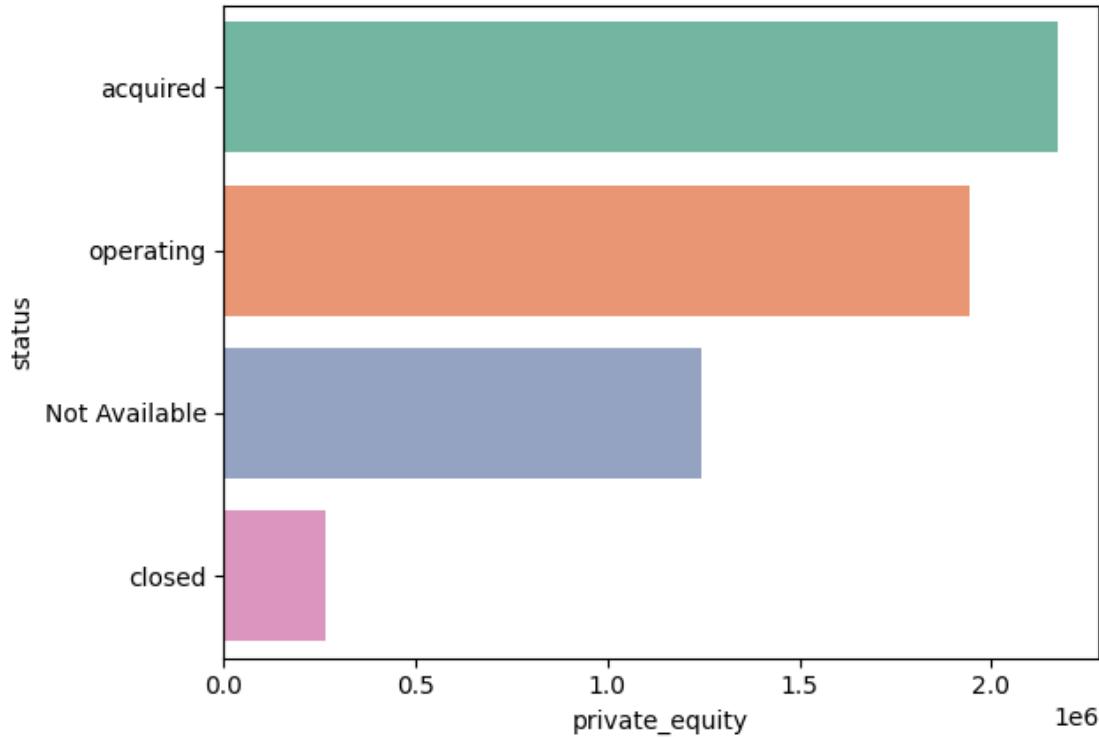
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'sum'}).reset_index().  
      ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['status'],palette='Set2')
```

```
[ ]: <Axes: xlabel='private_equity', ylabel='status'>
```



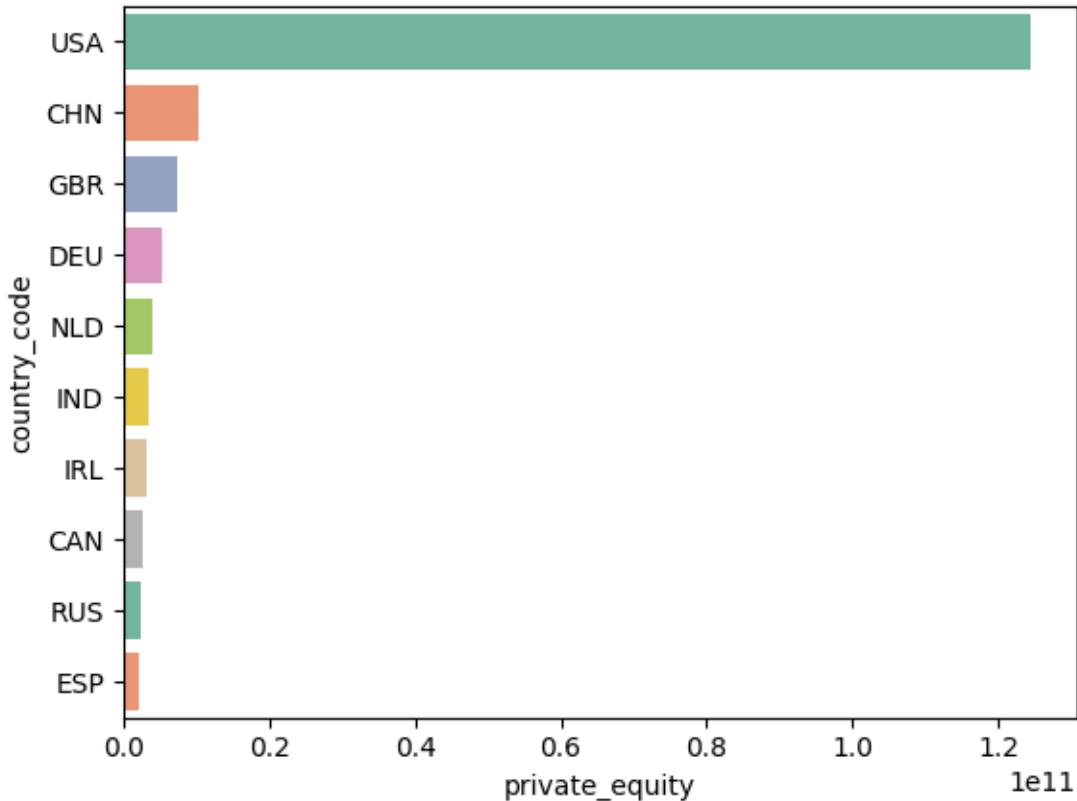
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'mean'}).reset_index()
      .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='private_equity', ylabel='status'>
```



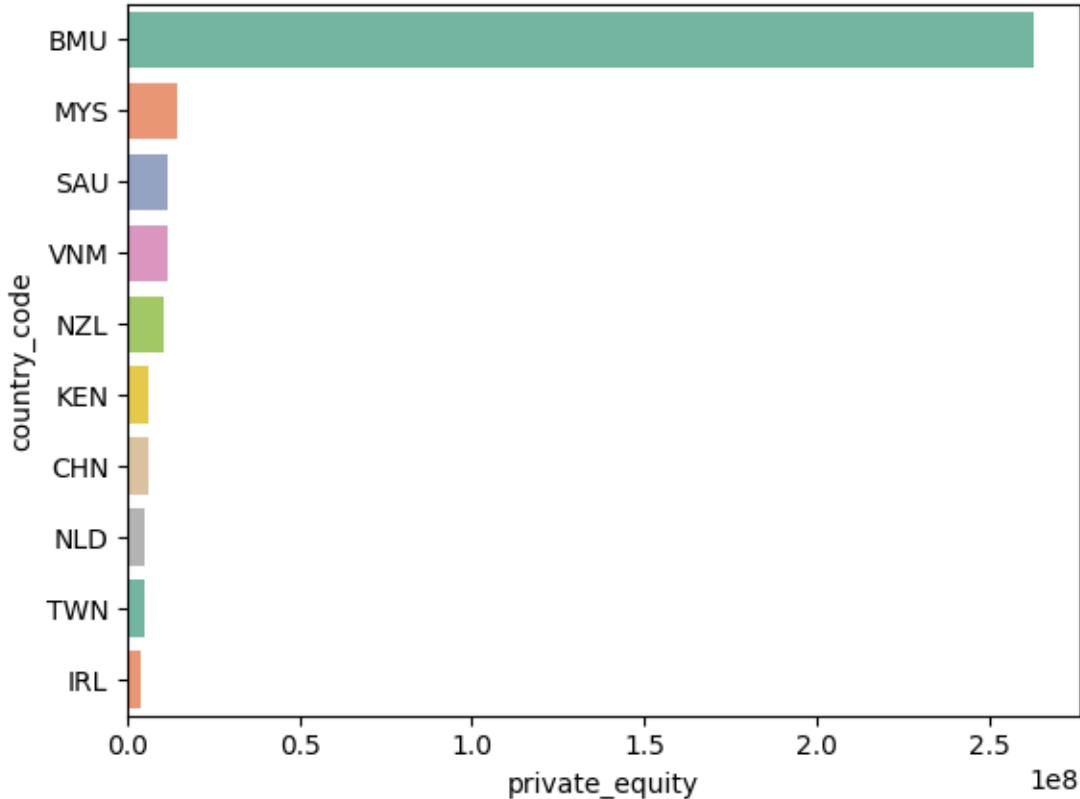
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'sum'}).reset_index().  
     .sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='private_equity', ylabel='country_code'>
```



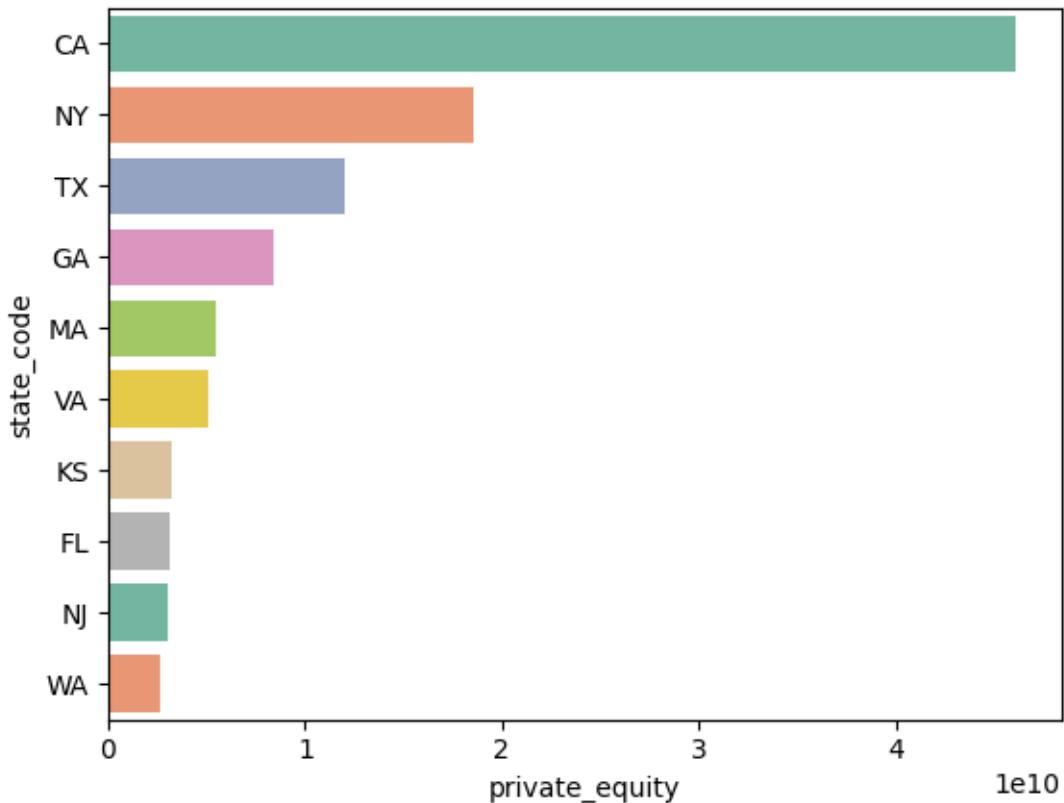
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='private_equity', ylabel='country_code'>
```



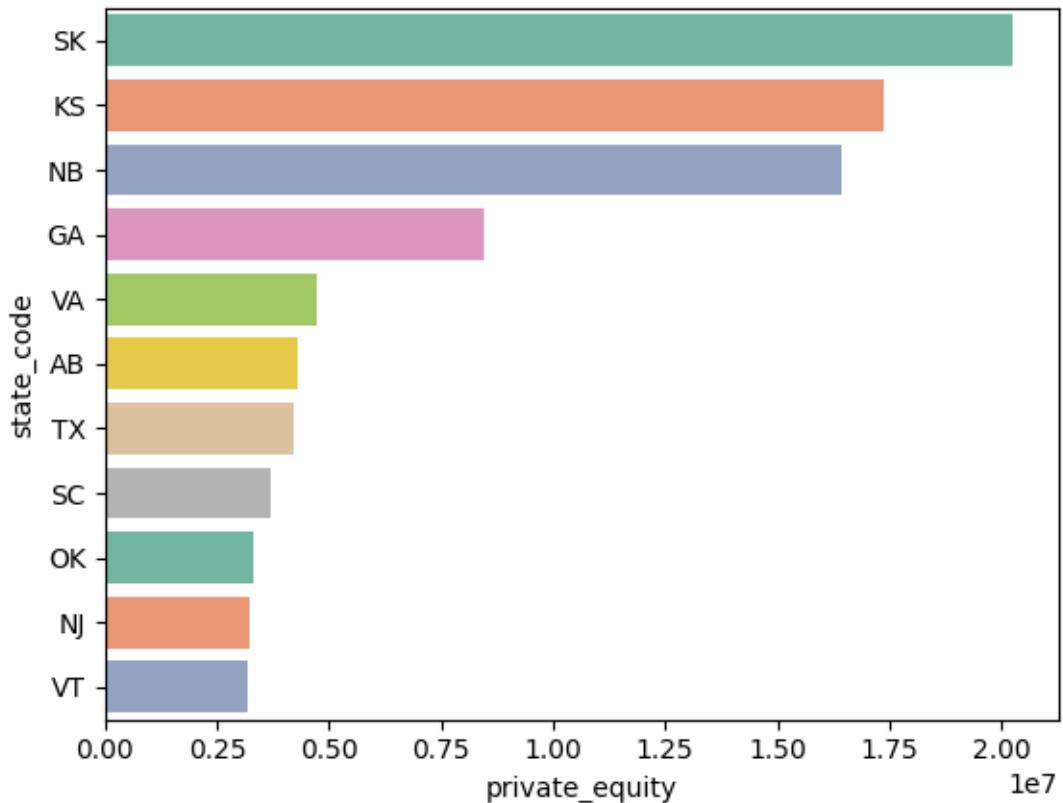
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='private_equity', ylabel='state_code'>
```



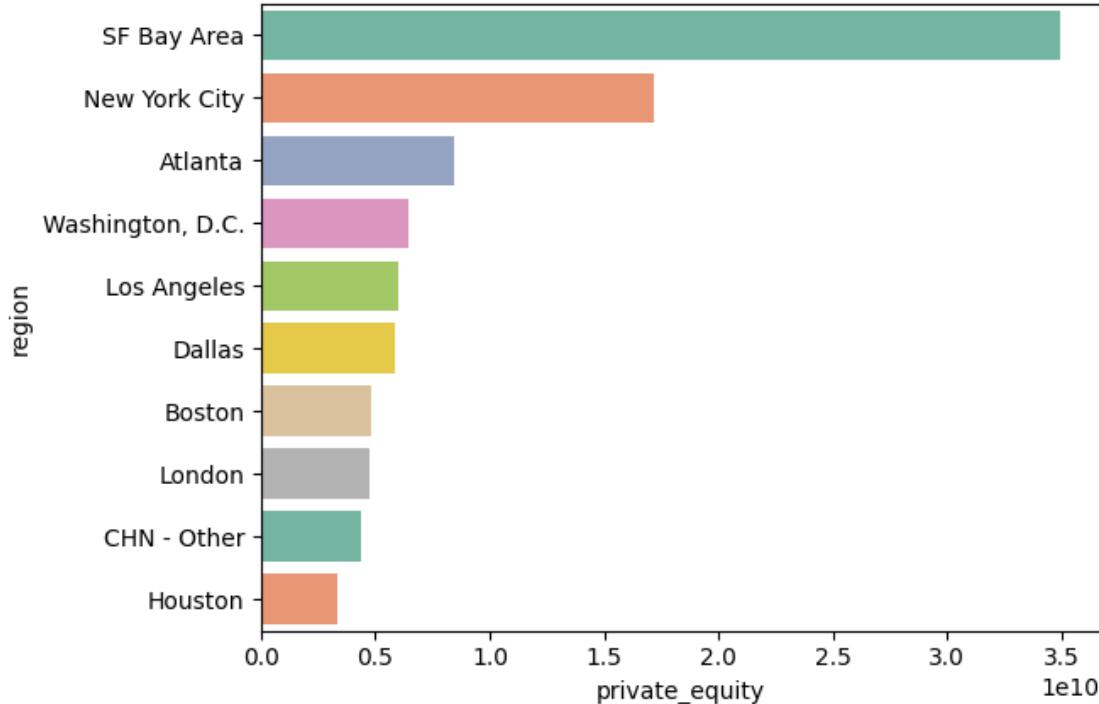
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='private_equity', ylabel='state_code'>
```



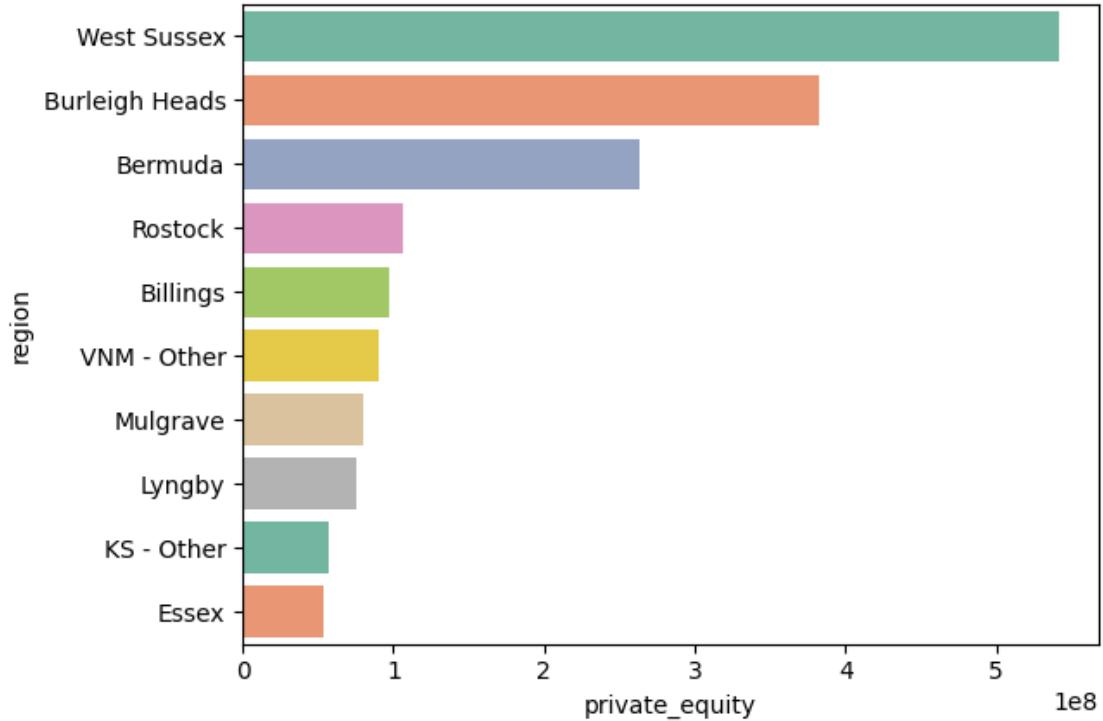
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='private_equity', ylabel='region'>
```



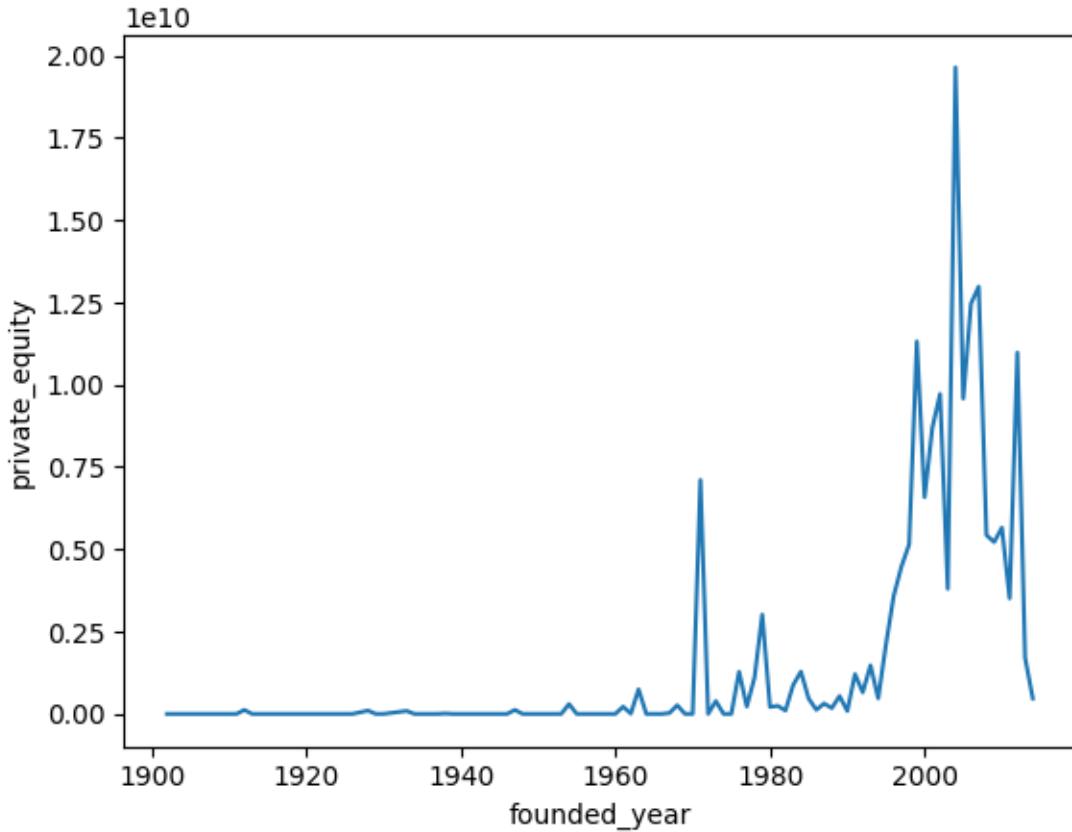
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'mean'}).reset_index().  
     ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['region']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='private_equity', ylabel='region'>
```



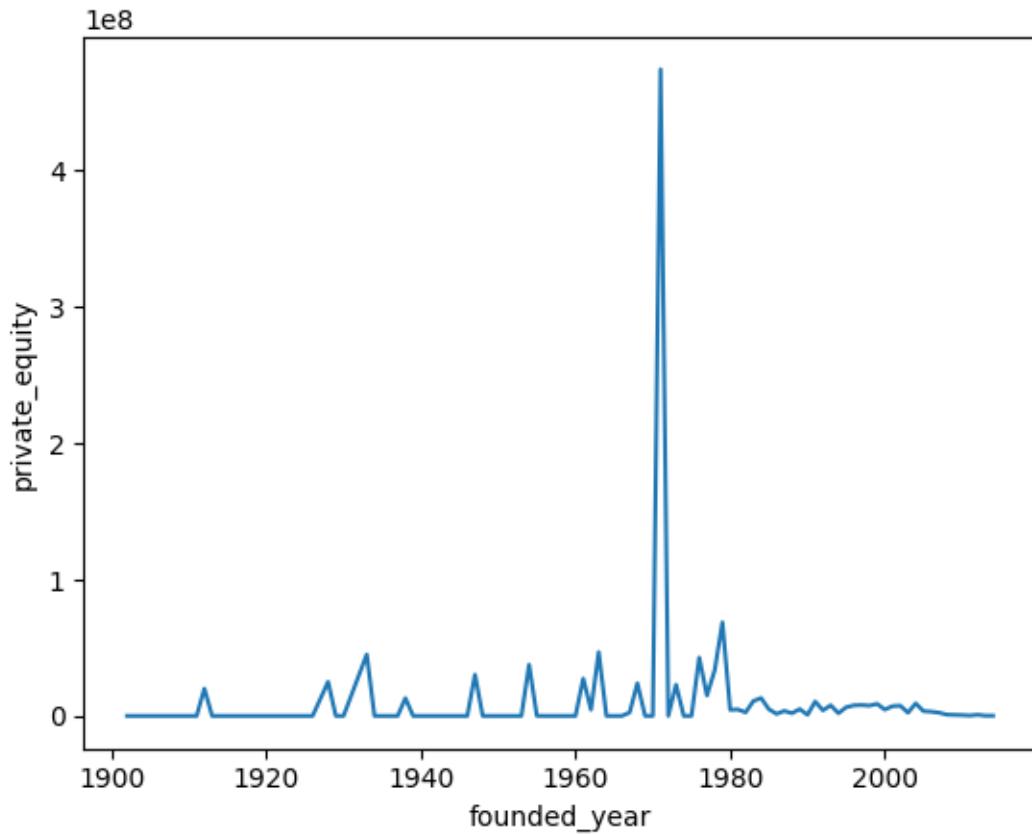
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='private_equity'>
```

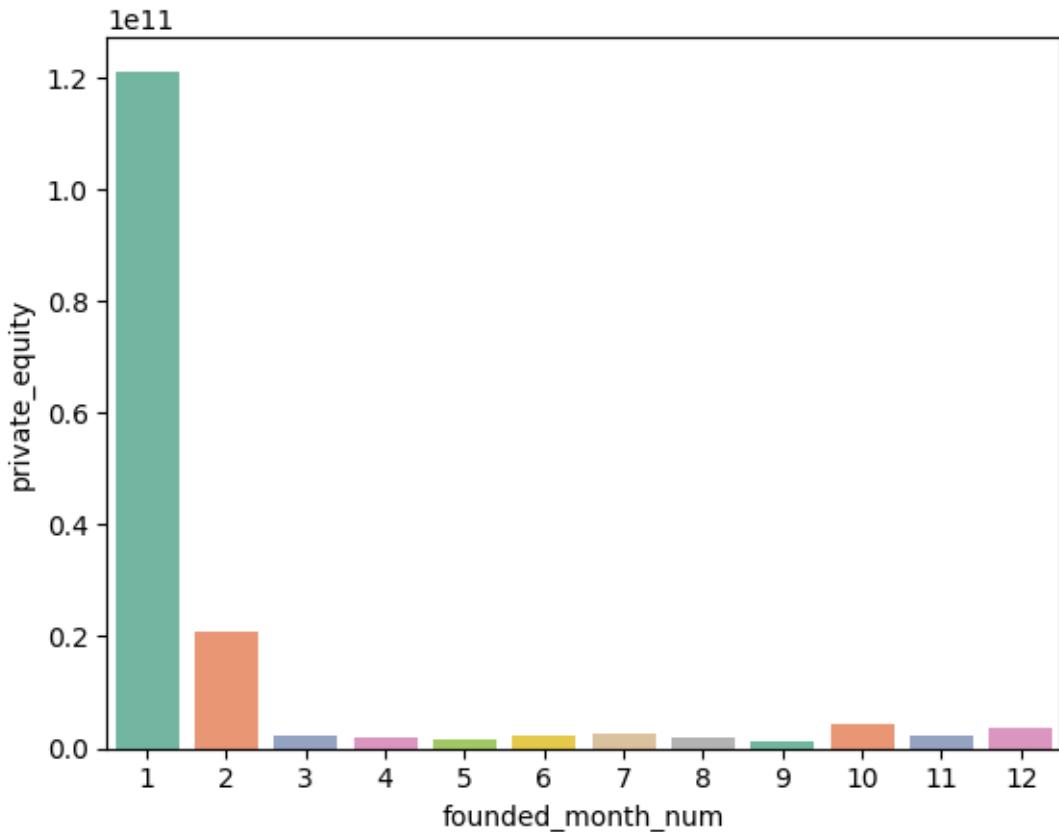


```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='private_equity'>
```

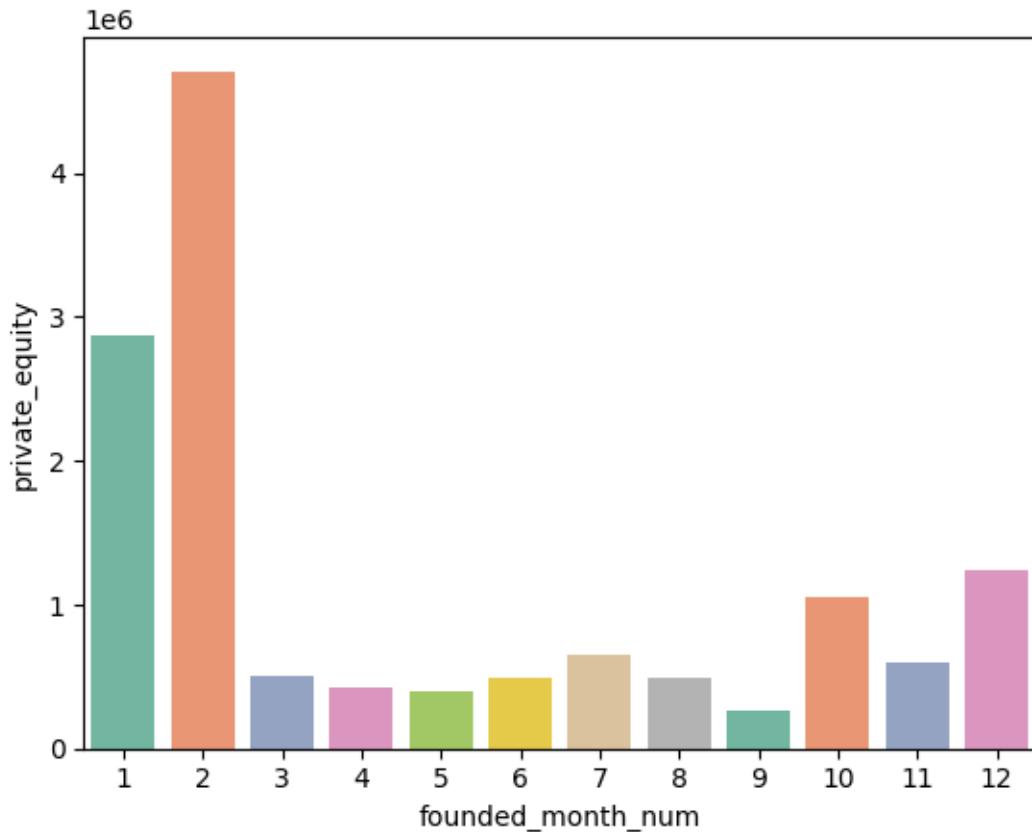


```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_month_num'] > 0]  
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')  
  
[ ]: <Axes: xlabel='founded_month_num', ylabel='private_equity'>
```



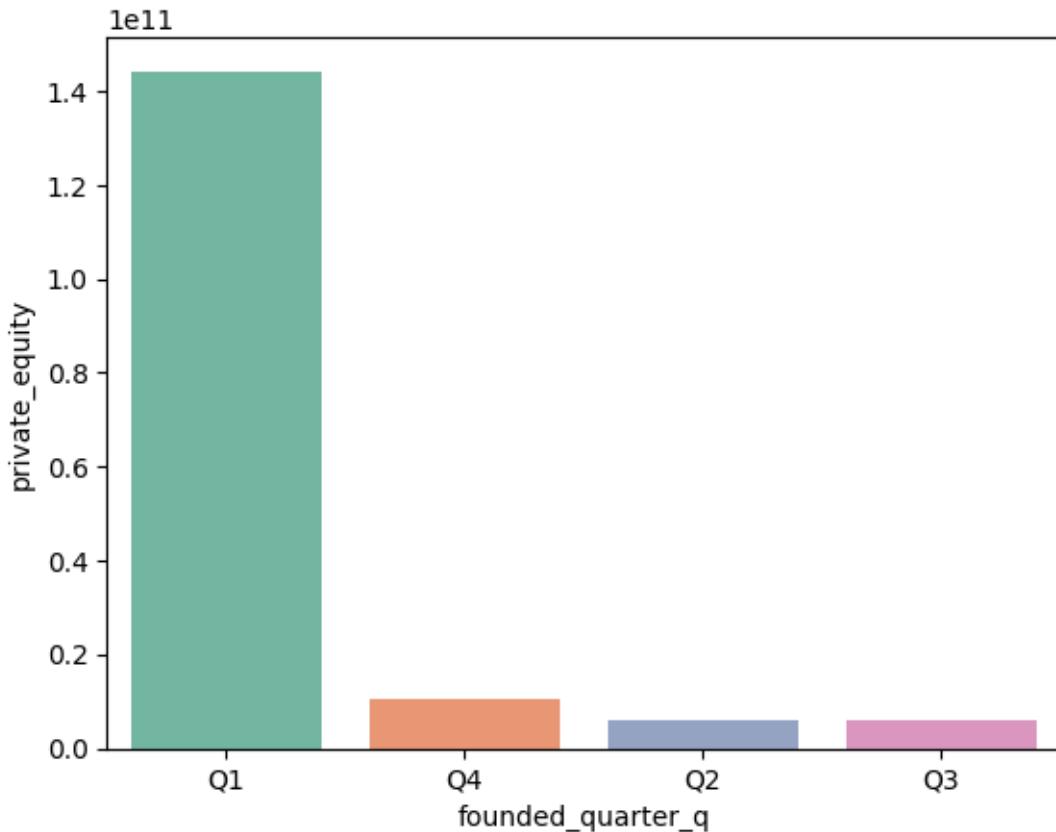
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='private_equity'>
```



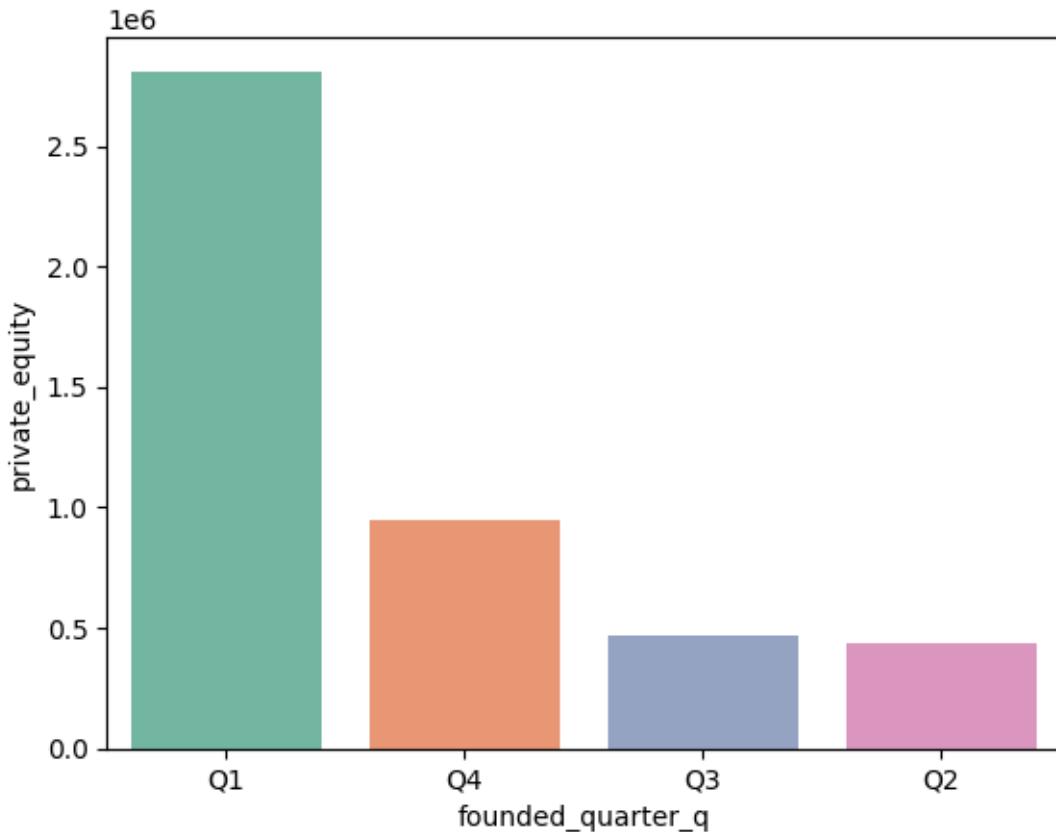
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']  
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='private_equity'>
```



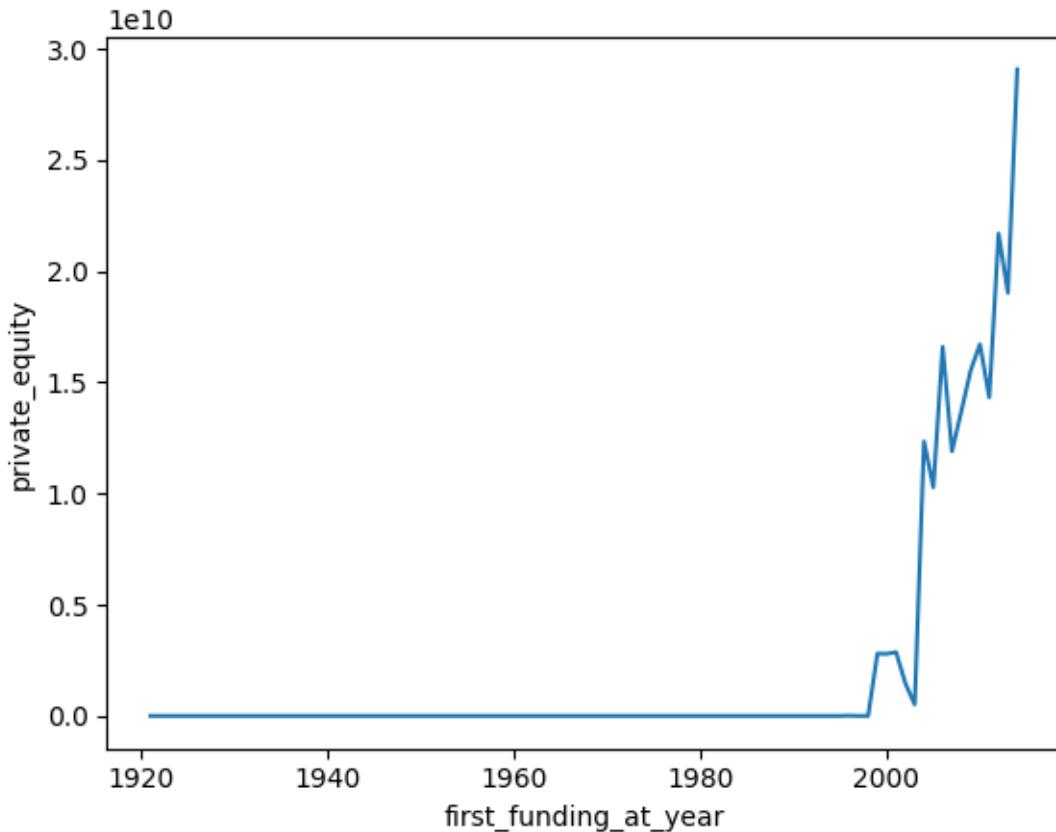
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'mean'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_quarter_q']!= 'Q0']  
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='private_equity'>
```



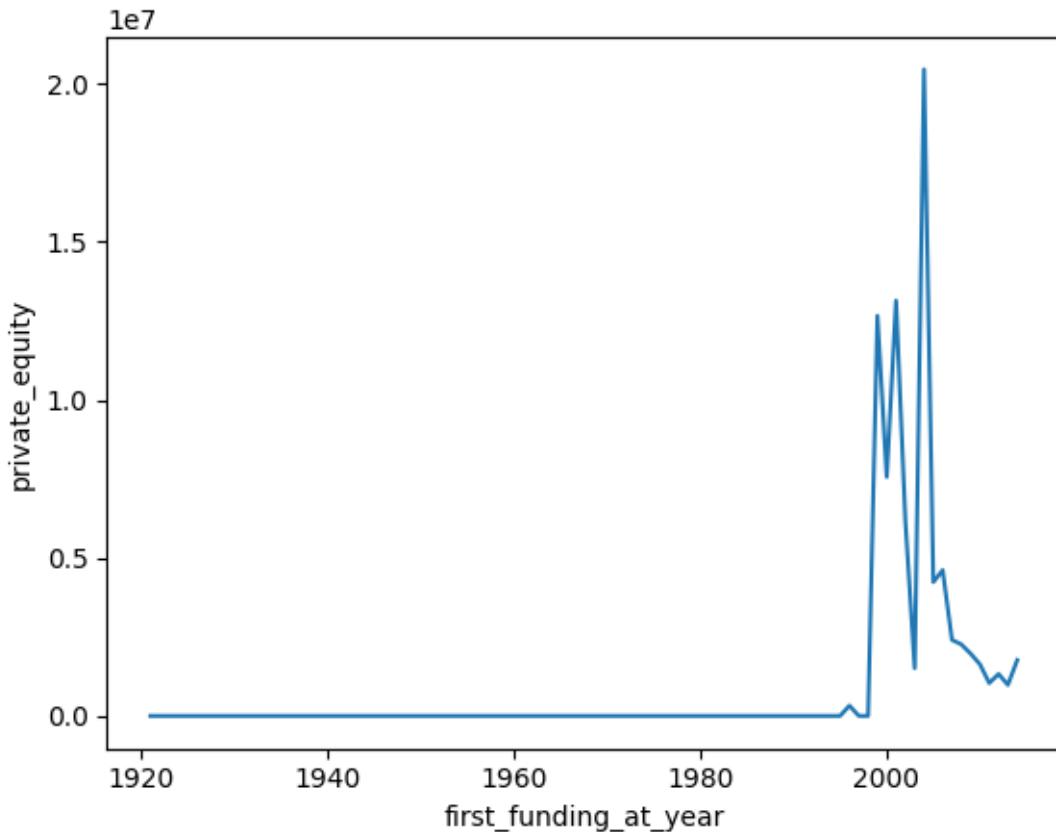
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='private_equity'>
```



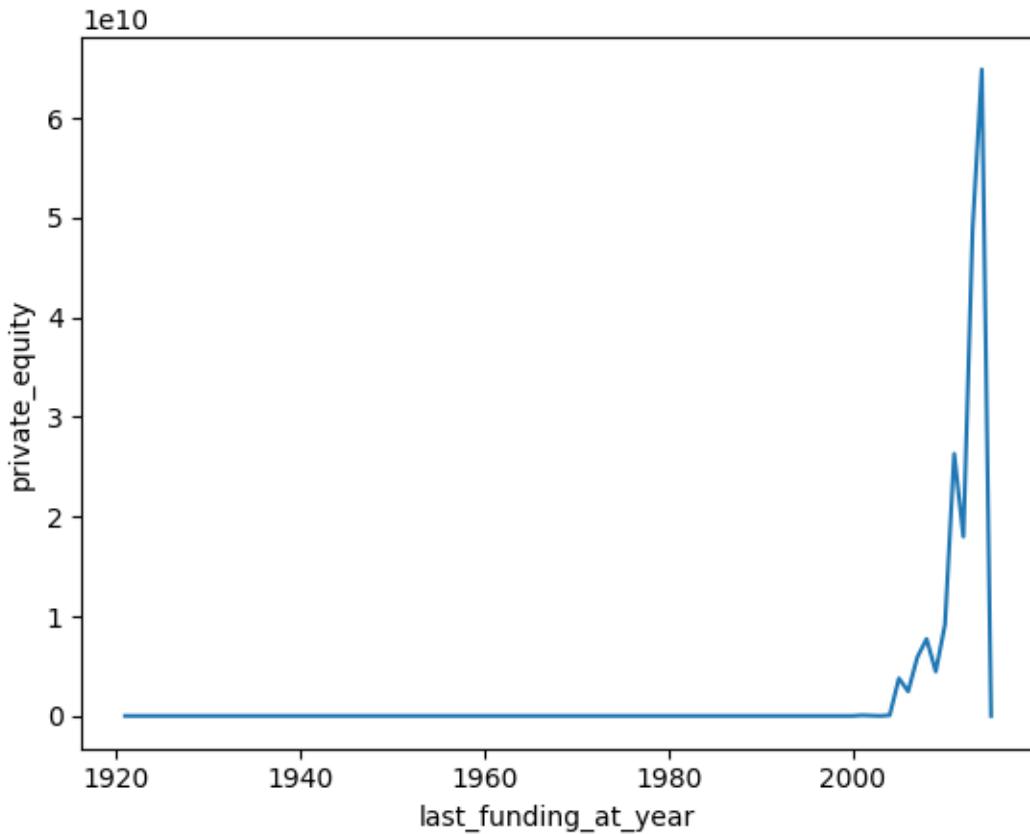
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'mean'}).
      ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='private_equity'>
```



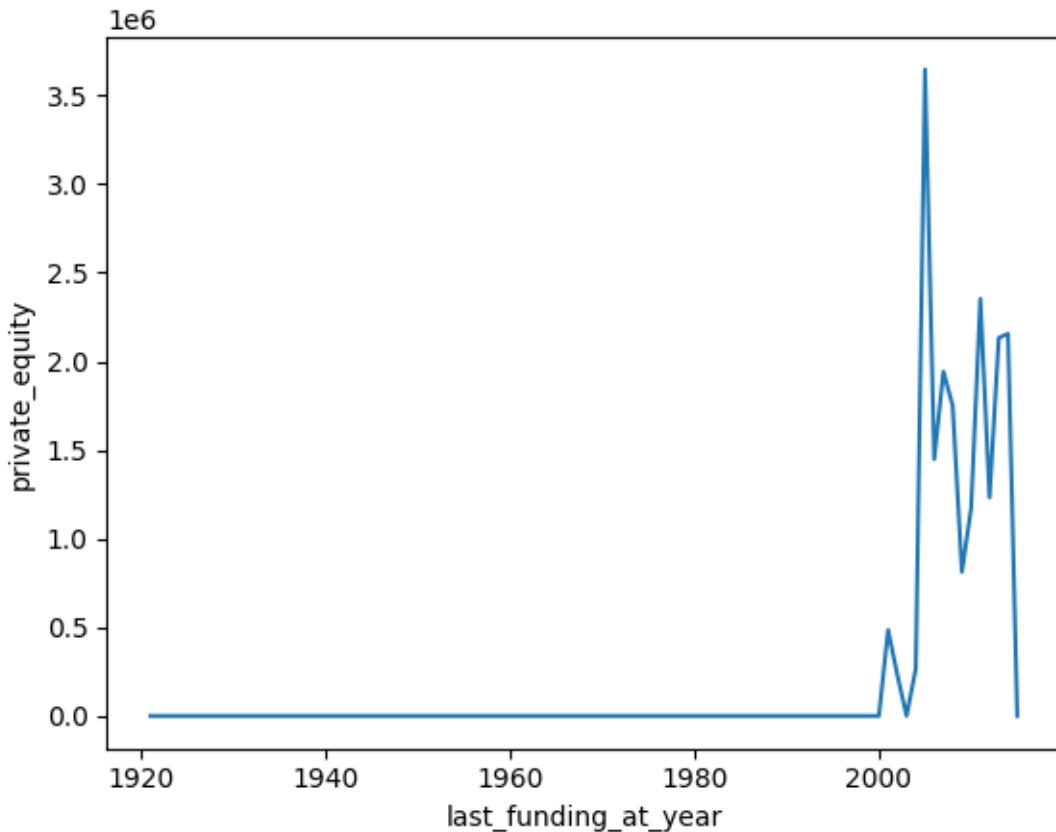
```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='private_equity'>
```



```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='private_equity'>
```



## 1.14 Post IPO Equity Funds

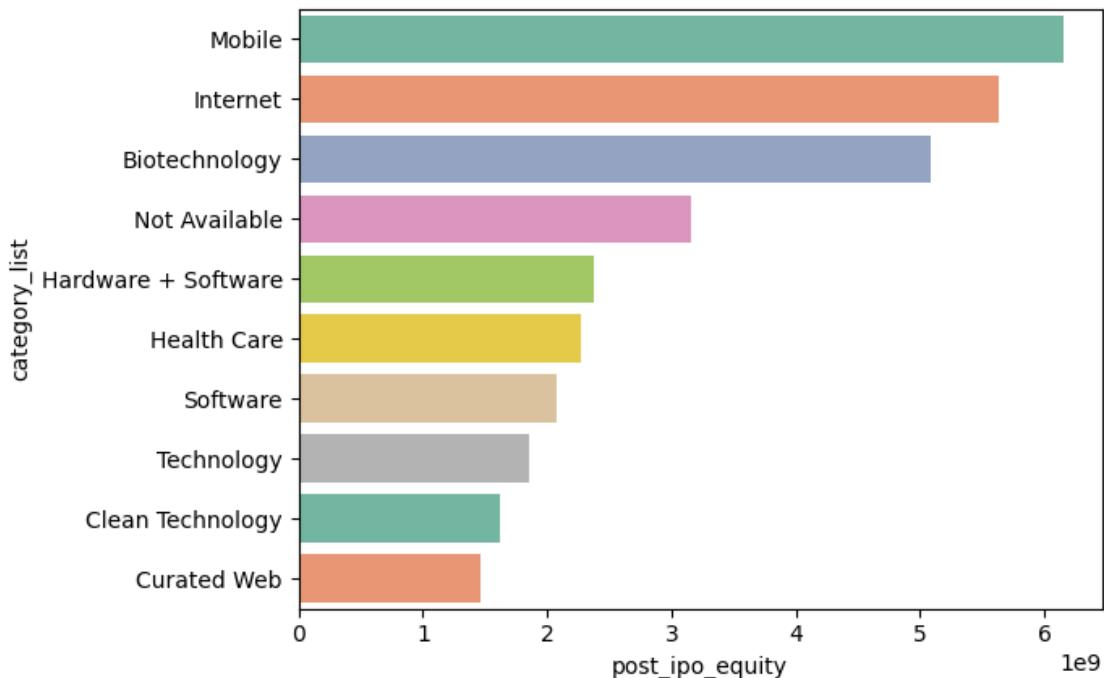
1. Post-IPO equity funding is when a company invests in another company after it has gone public.
2. Shares that are eligible for trading on public stock exchanges after a successful initial public offering

Average and Total Analysis of the Post IPO Equity Funds as shown below.

```
[ ]: column = 'post_ipo_equity'

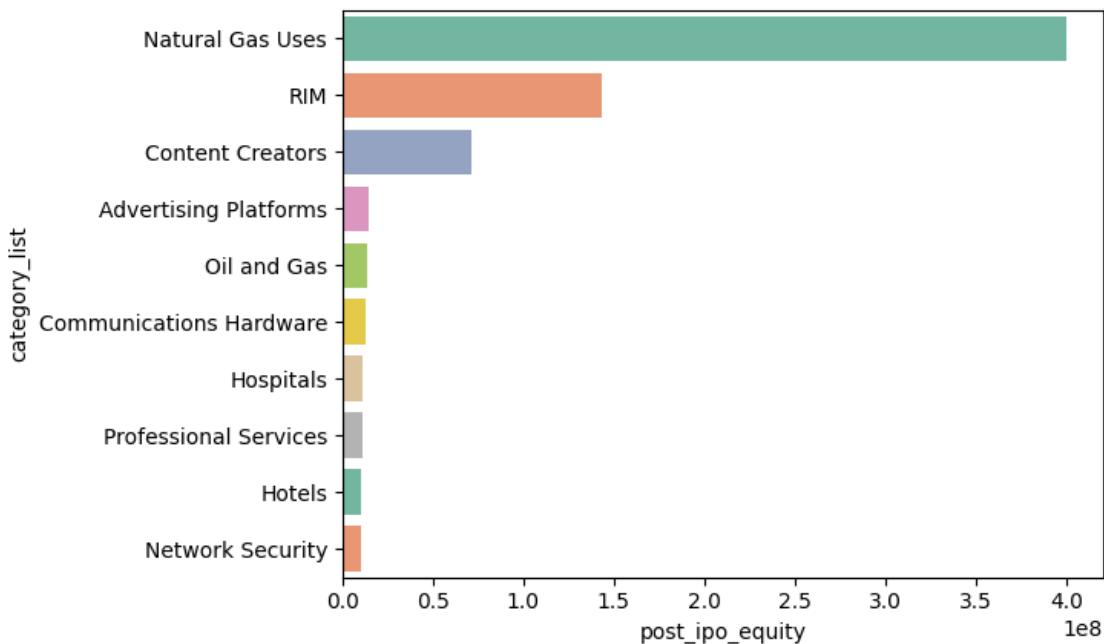
[ ]: df_plot = df_clean.groupby('category_list').agg({column: 'sum'}).reset_index().
    ↴sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')

[ ]: <Axes: xlabel='post_ipo_equity', ylabel='category_list'>
```



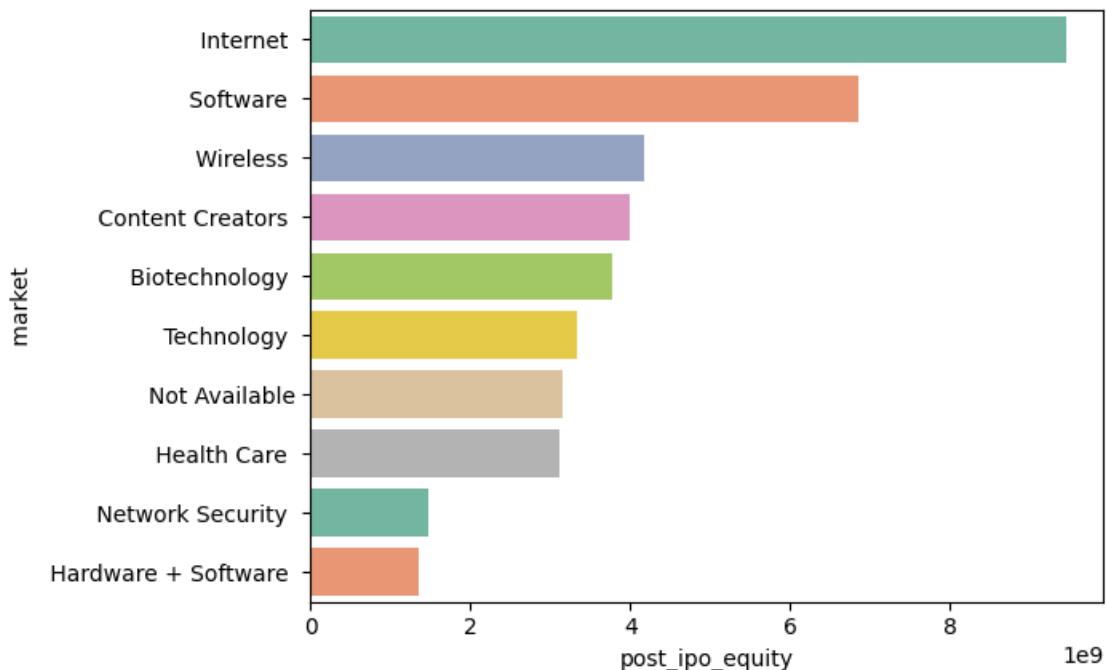
```
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'mean'}).reset_index()
      .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')
```

```
[ ]: <Axes: xlabel='post_ipo_equity', ylabel='category_list'>
```



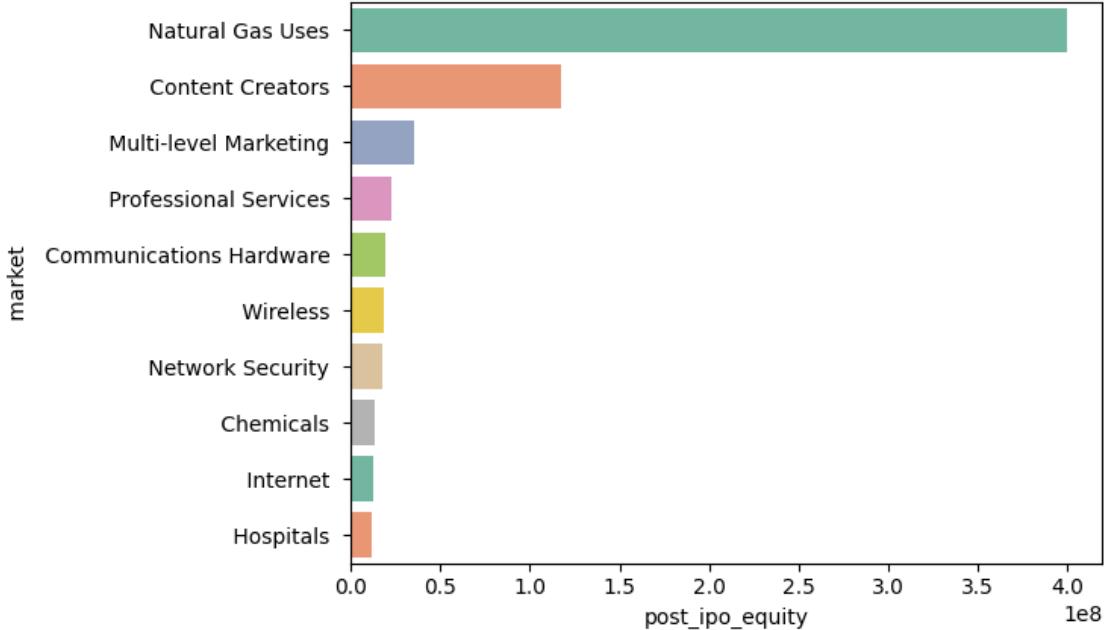
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'sum'}).reset_index() .  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='post_ipo_equity', ylabel=' market '>
```



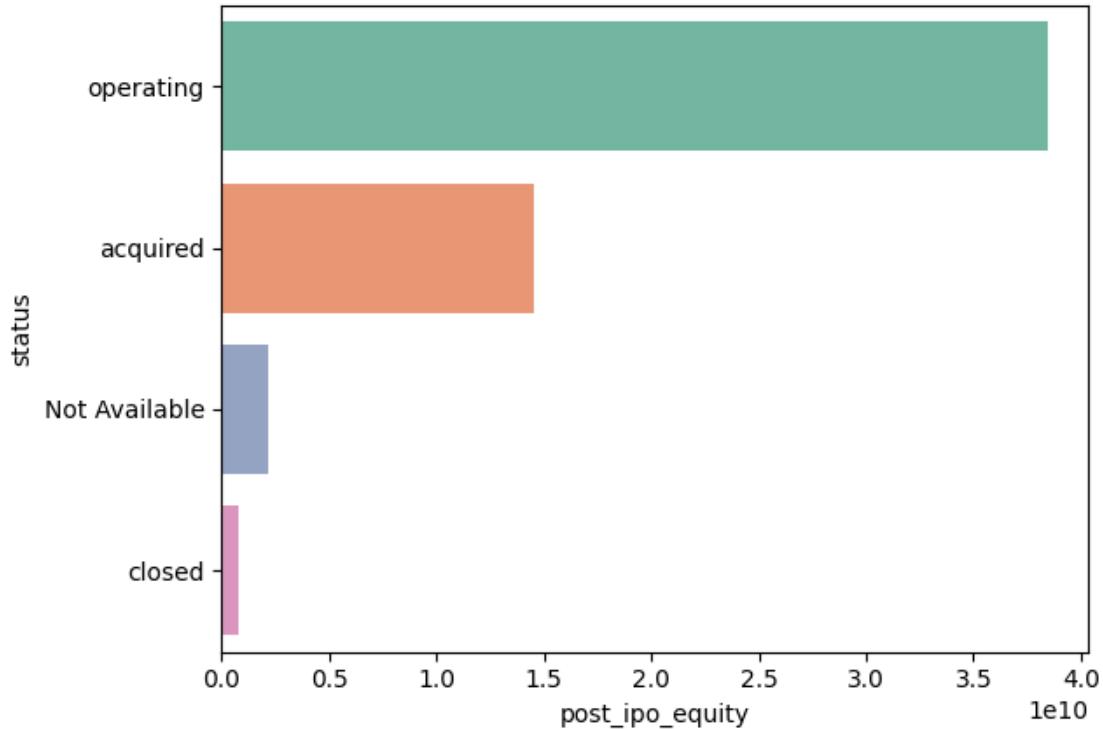
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='post_ipo_equity', ylabel=' market '>
```



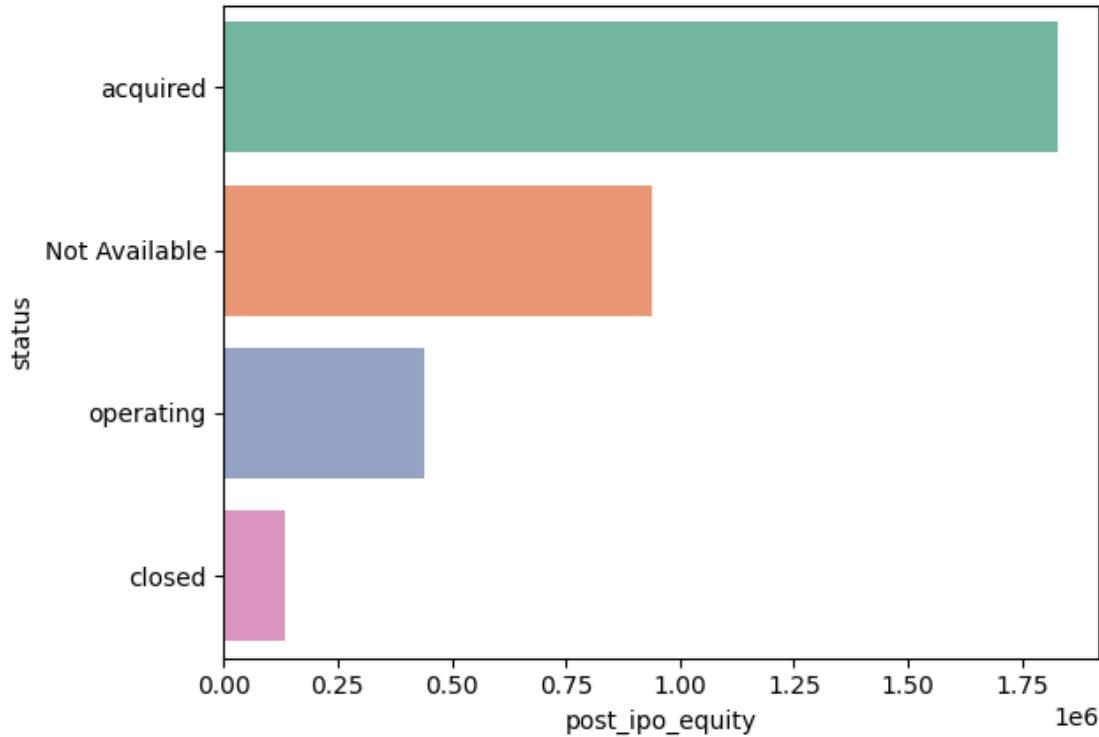
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='post_ipo_equity', ylabel='status'>
```



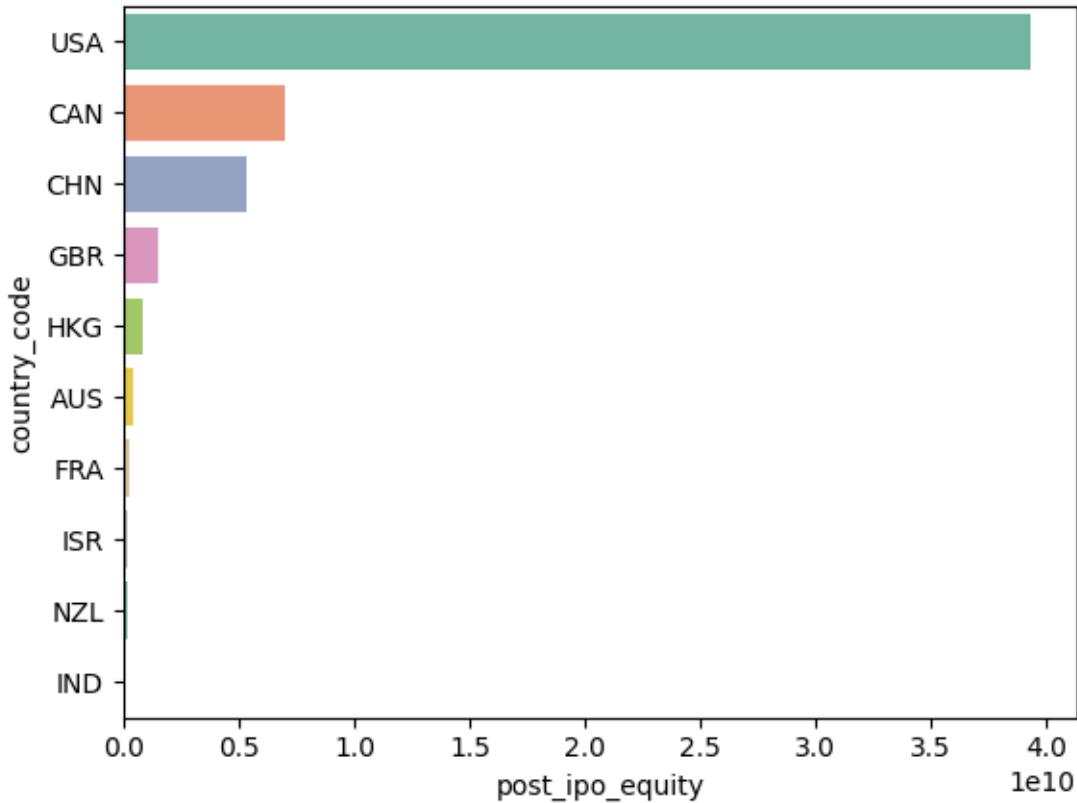
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'mean'}).reset_index()
    ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='post_ipo_equity', ylabel='status'>
```



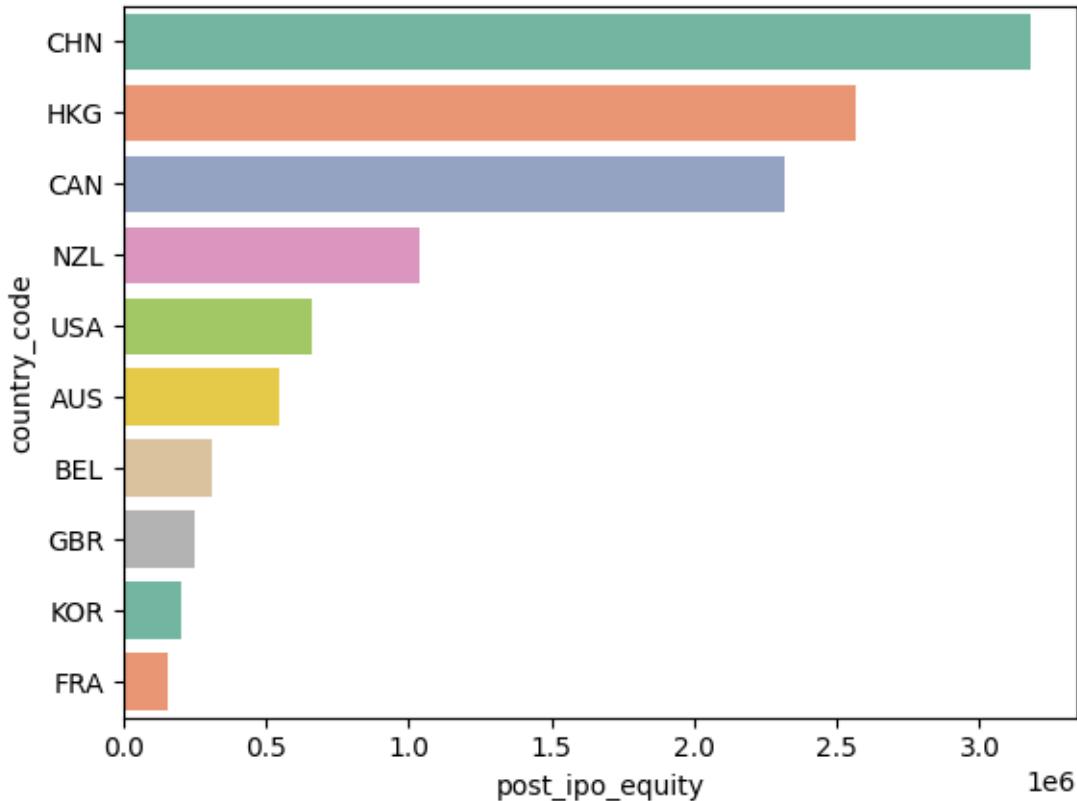
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column,ascending=False).head(11)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='post_ipo_equity', ylabel='country_code'>
```



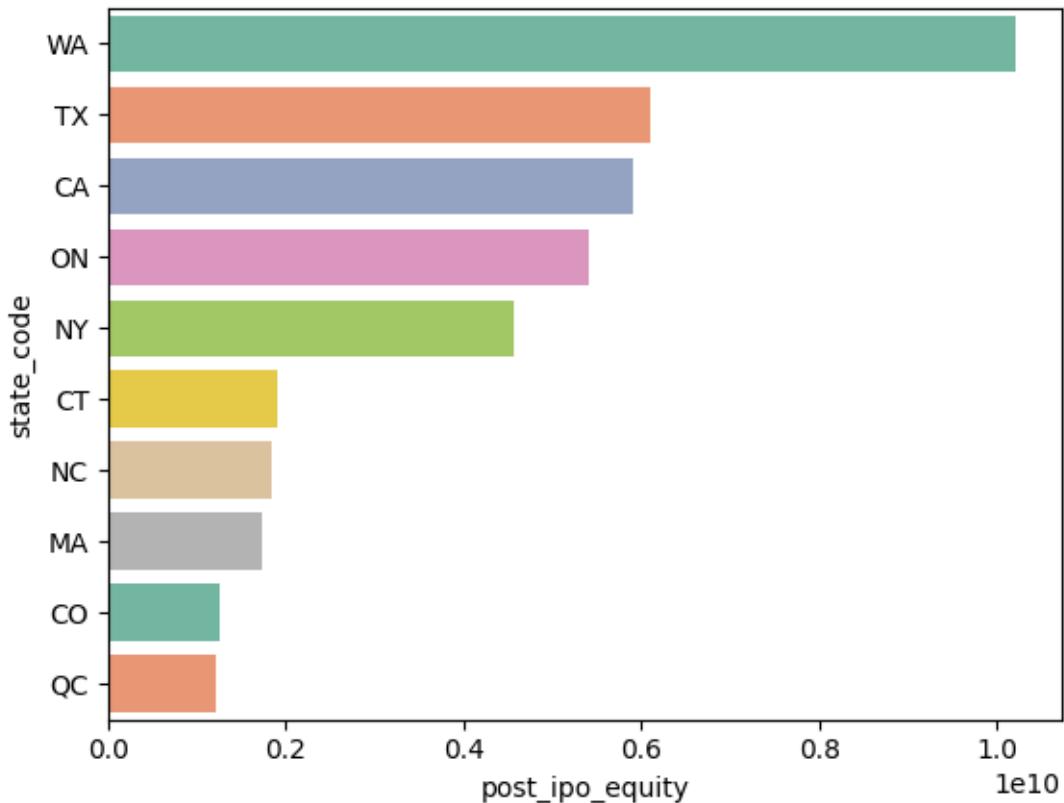
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='post_ipo_equity', ylabel='country_code'>
```



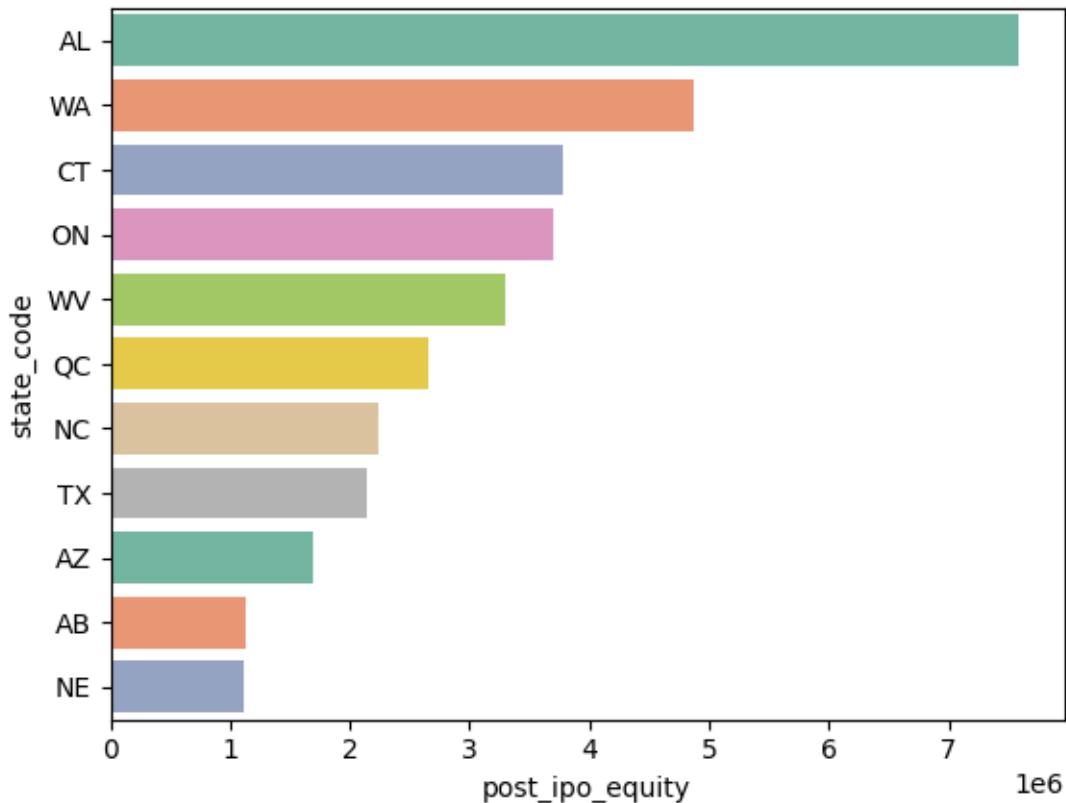
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='post_ipo_equity', ylabel='state_code'>
```



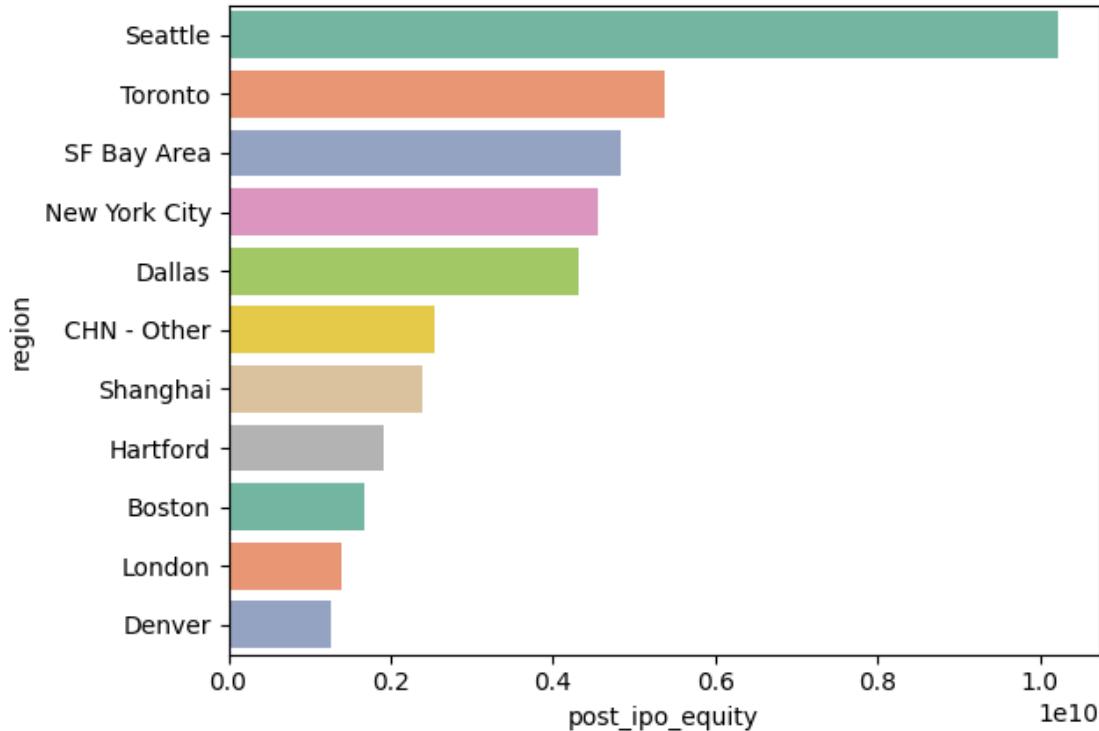
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='post_ipo_equity', ylabel='state_code'>
```



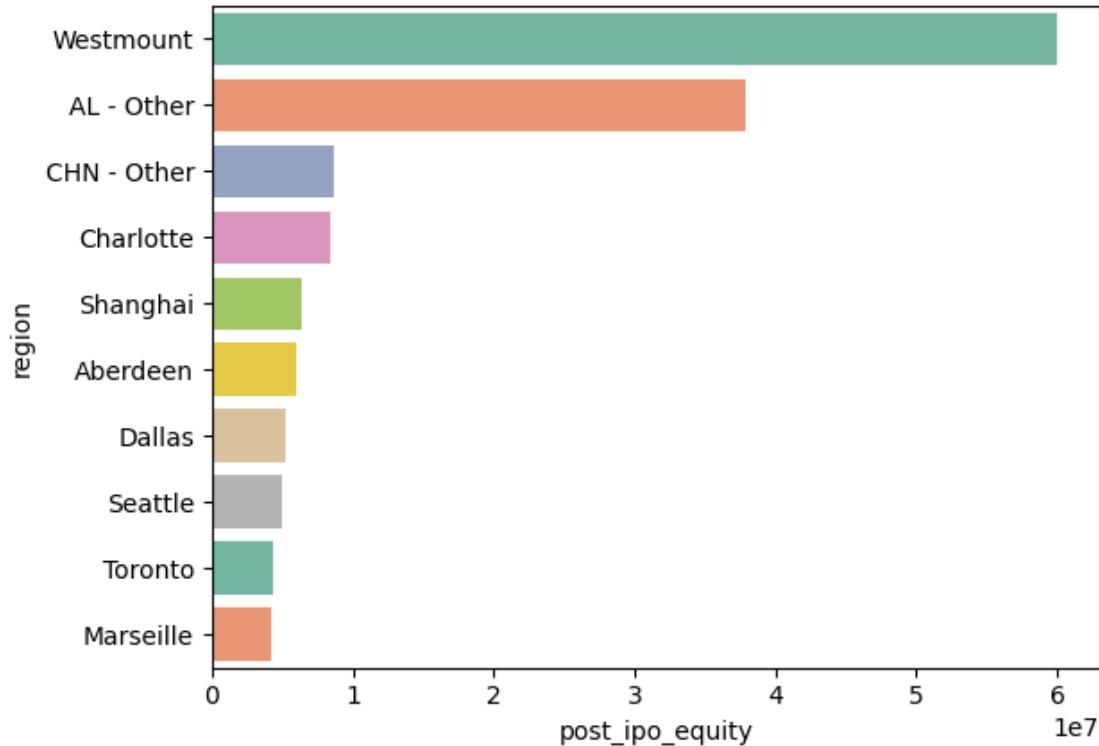
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='post_ipo_equity', ylabel='region'>
```



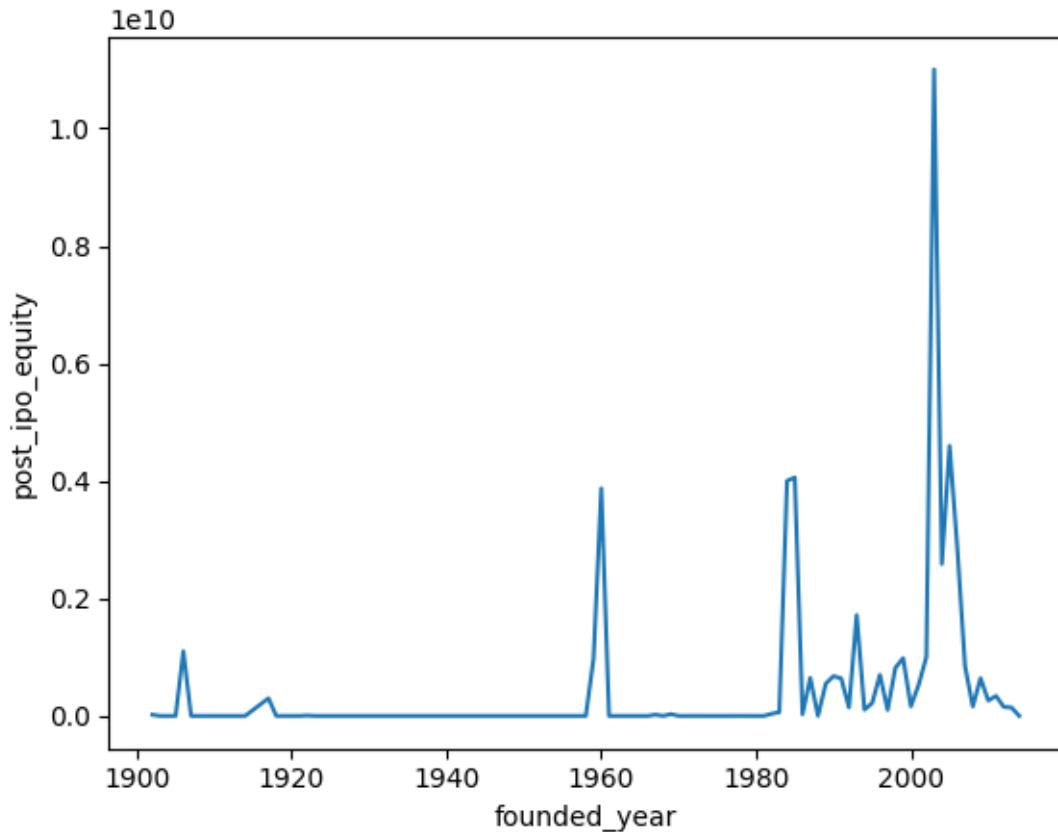
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'mean'}).reset_index()
      ↪sort_values(column, ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='post_ipo_equity', ylabel='region'>
```



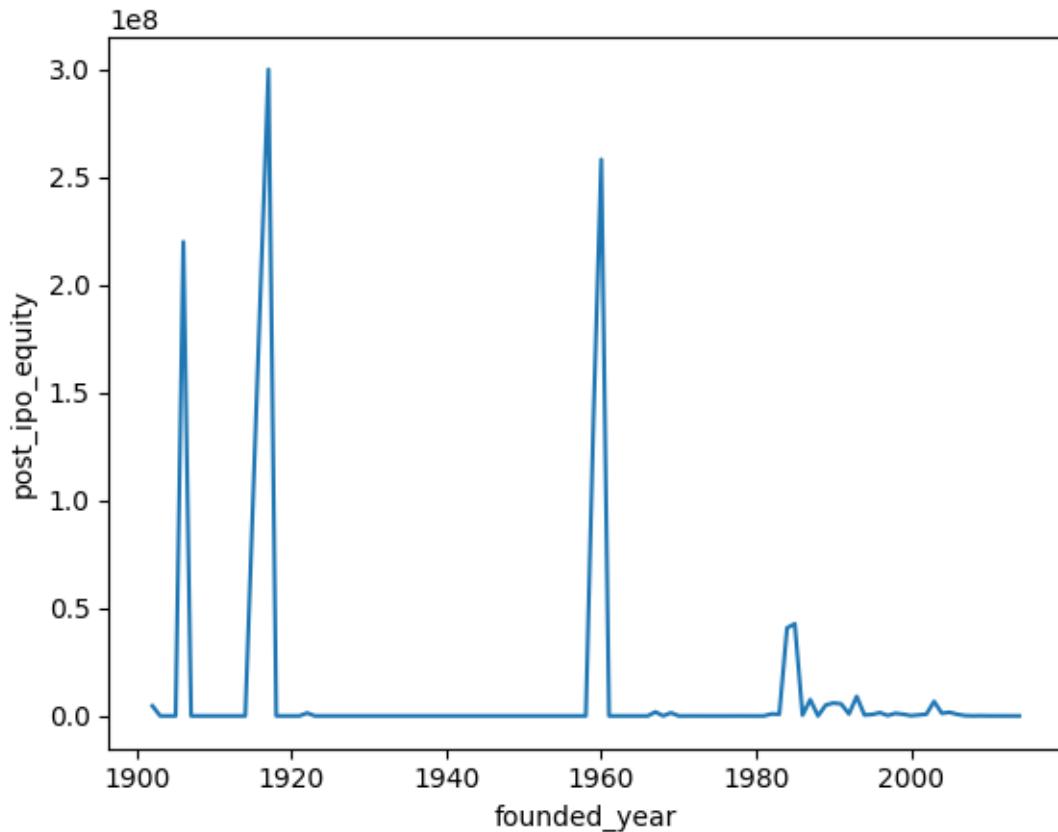
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'sum'}).reset_index().  
     ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='post_ipo_equity'>
```



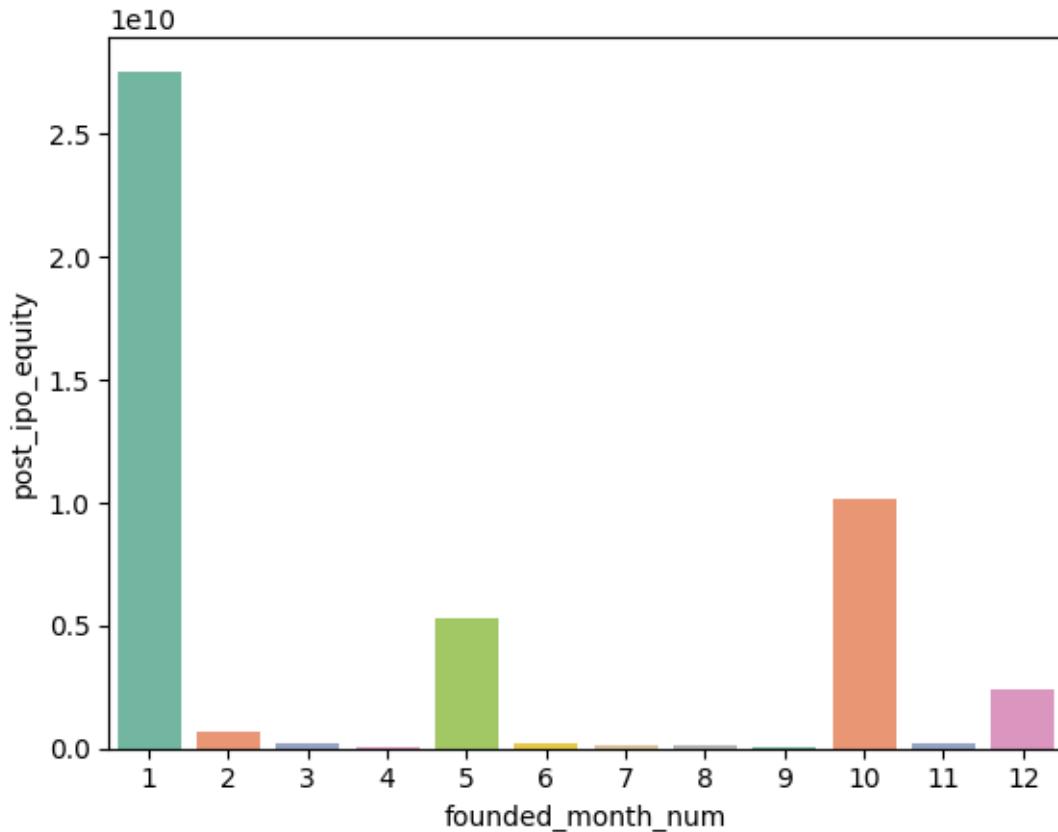
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'mean'}).reset_index().  
      ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='post_ipo_equity'>
```



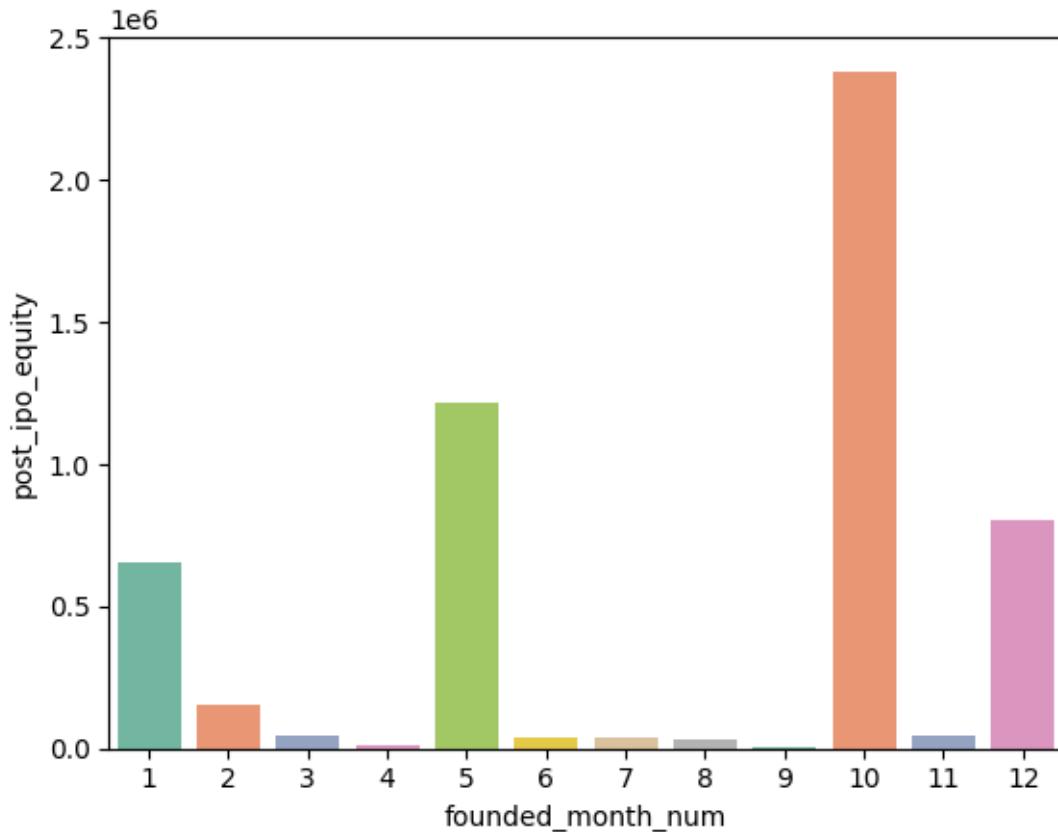
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'sum'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='post_ipo_equity'>
```



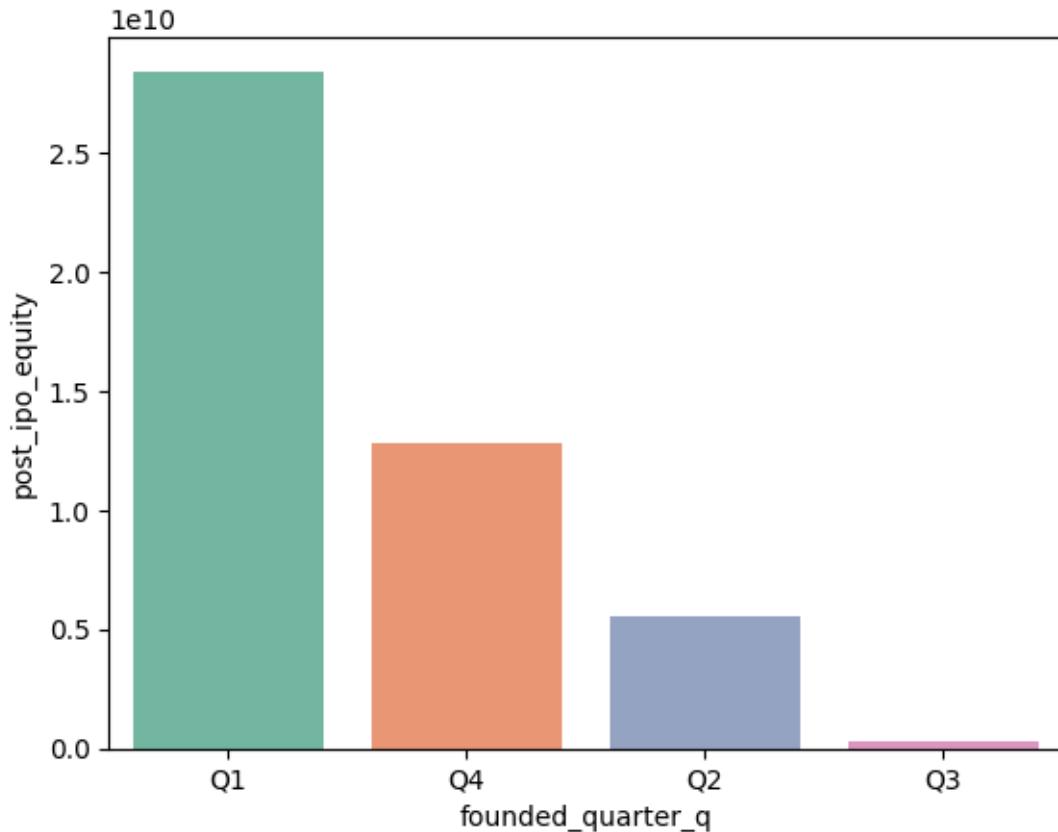
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='post_ipo_equity'>
```



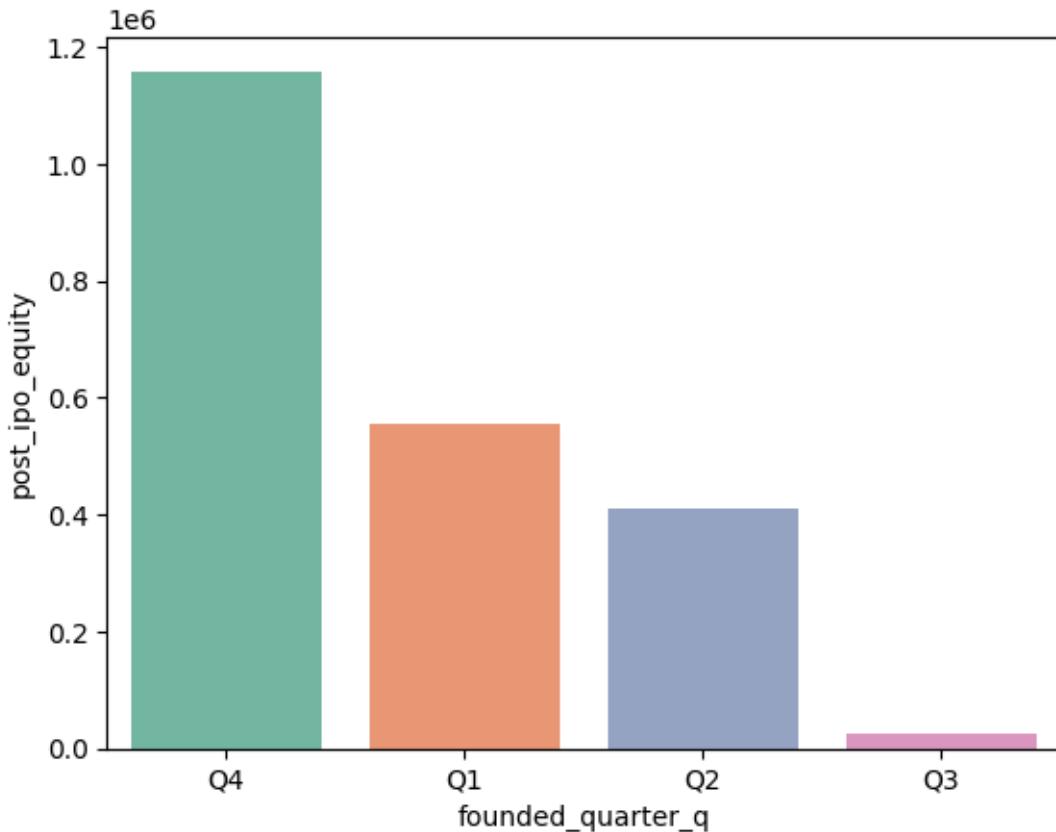
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'sum'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q']!= 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='post_ipo_equity'>
```



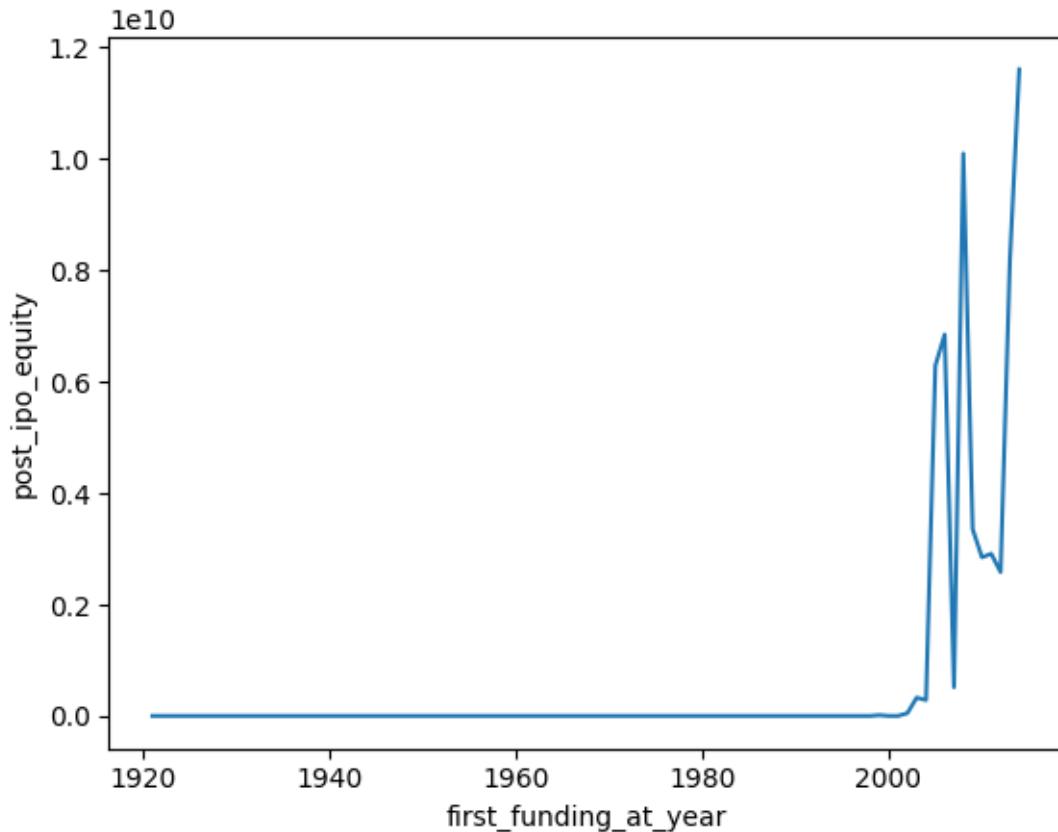
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'mean'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']  
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='post_ipo_equity'>
```



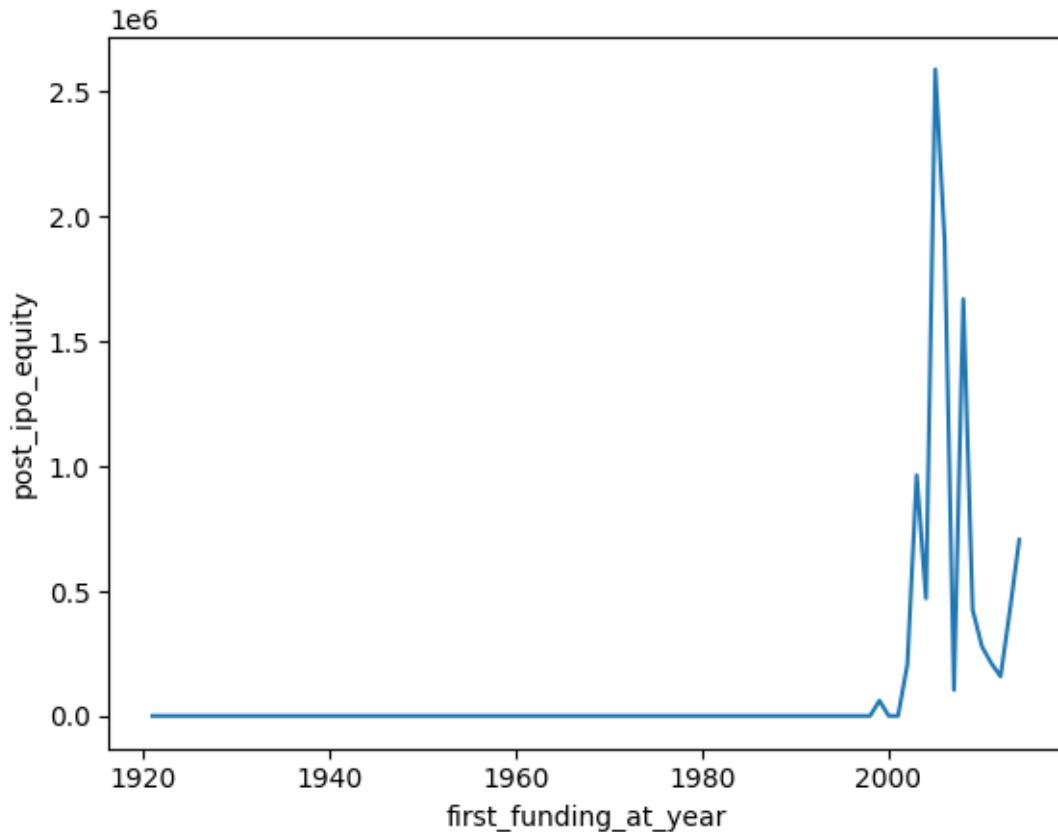
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='post_ipo_equity'>
```



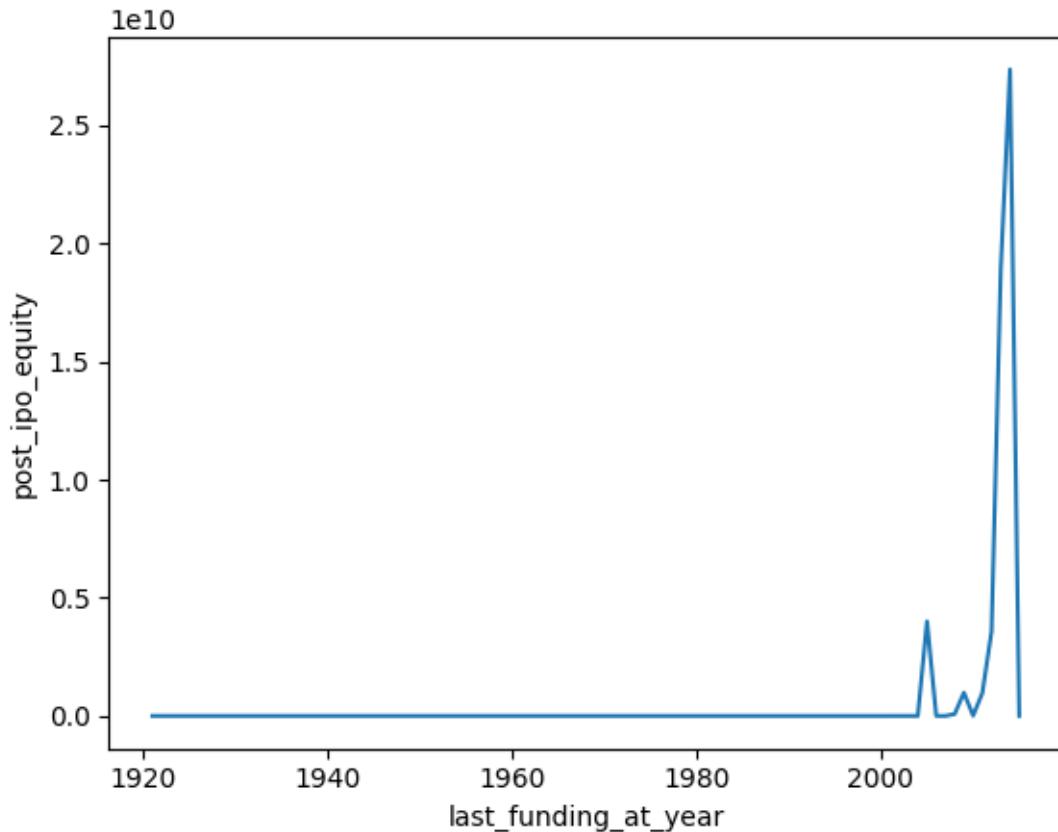
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='post_ipo_equity'>
```

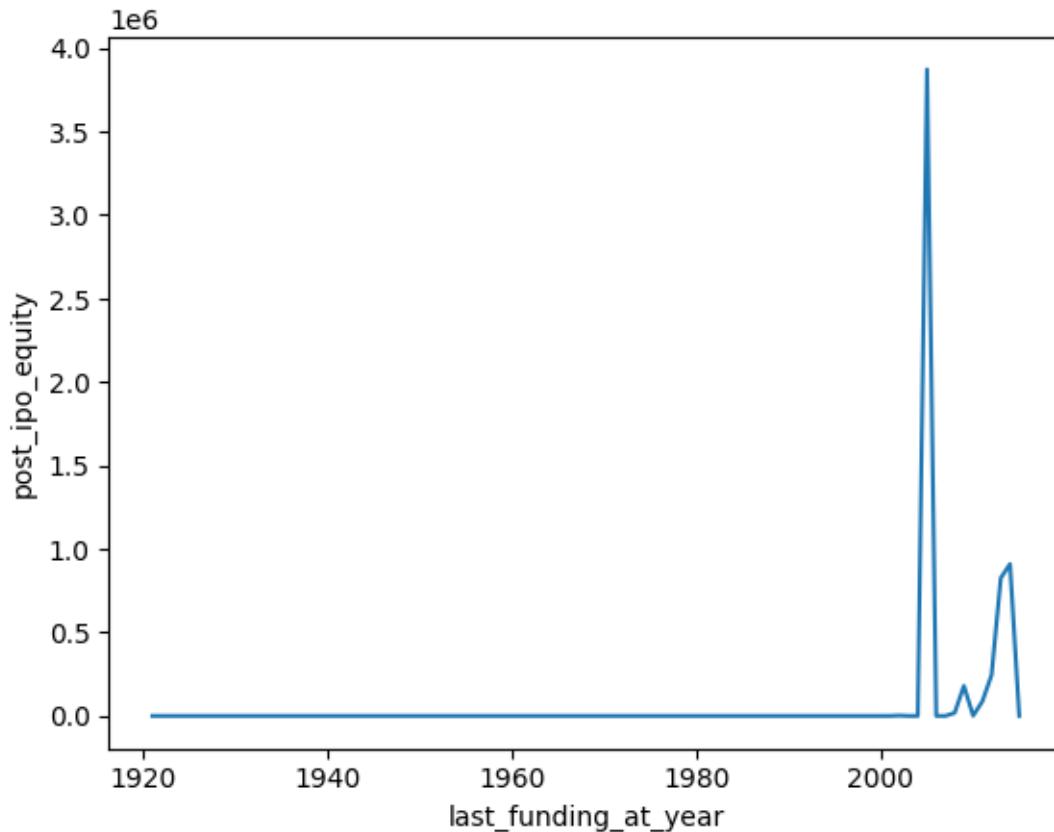


```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='post_ipo_equity'>
```



```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'mean'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])  
  
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='post_ipo_equity'>
```



## 1.15 Post IPO Debt Funds

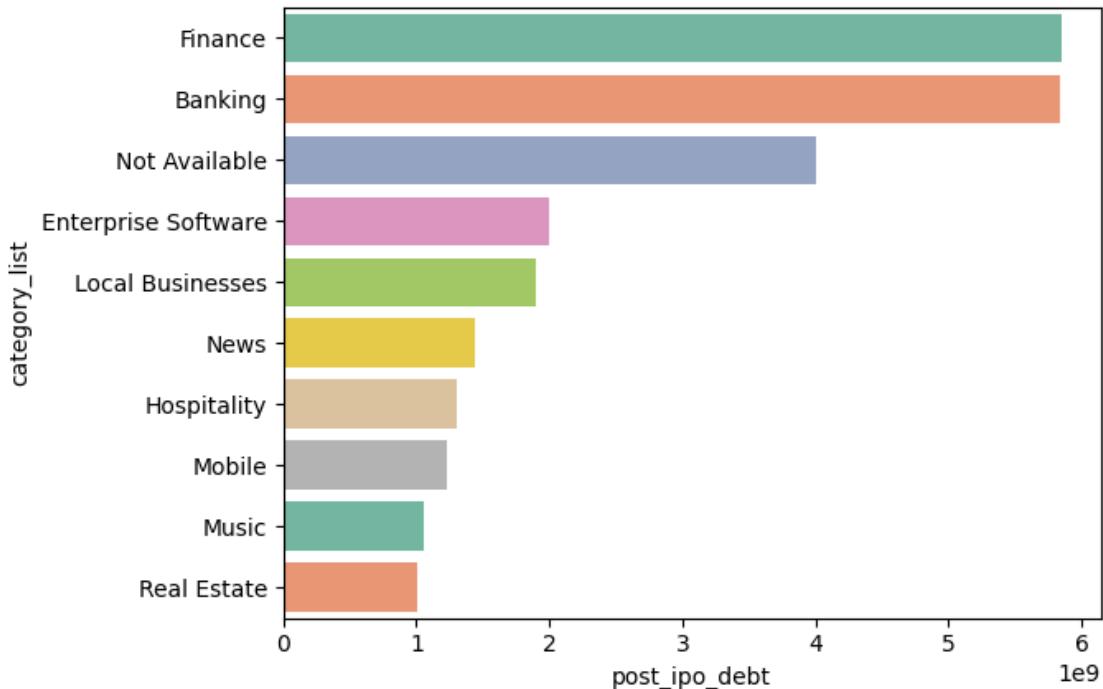
- Post-IPO debt funding is when a company borrows money from lenders after it has already gone public.
- The company promises to repay the principal and interest on the debt, similar to debt financing.

Average and Total Analysis of the Post IPO Debt Funds as shown below.

```
[ ]: column = 'post_ipo_debt'

[ ]: df_plot = df_clean.groupby('category_list').agg({column: 'sum'}).reset_index().
    sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')

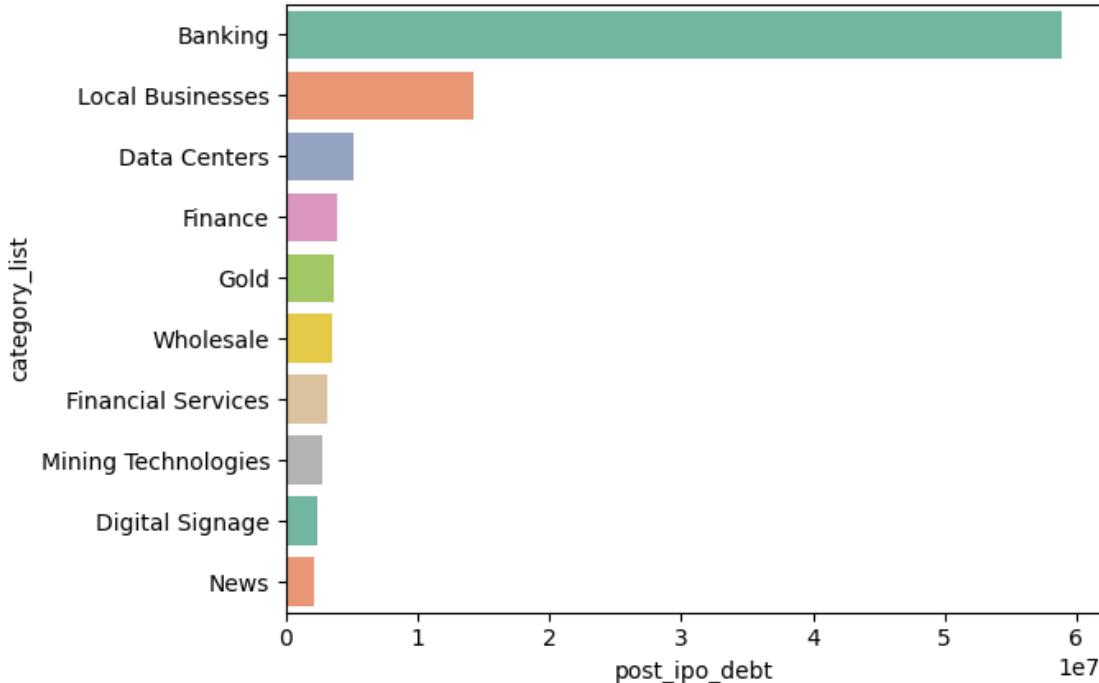
[ ]: <Axes: xlabel='post_ipo_debt', ylabel='category_list'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'mean'}).reset_index()
      .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')
```

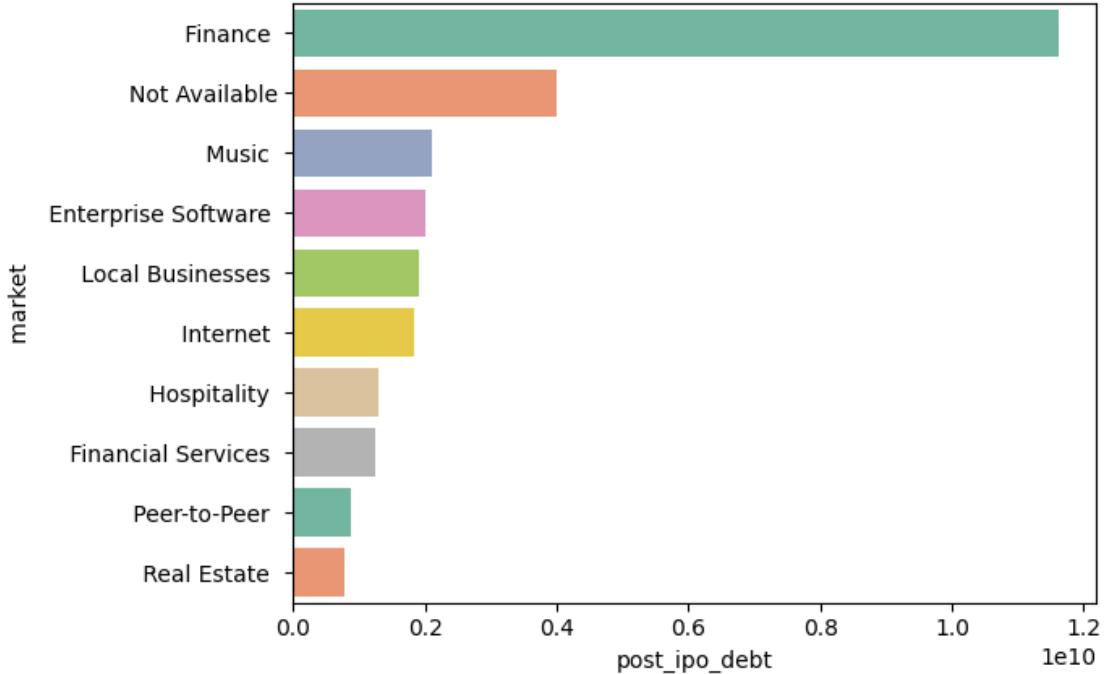
```
[ ]: <Axes: xlabel='post_ipo_debt', ylabel='category_list'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of avergae funding rounds.

```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'sum'}).reset_index()
    ↪sort_values(column,ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

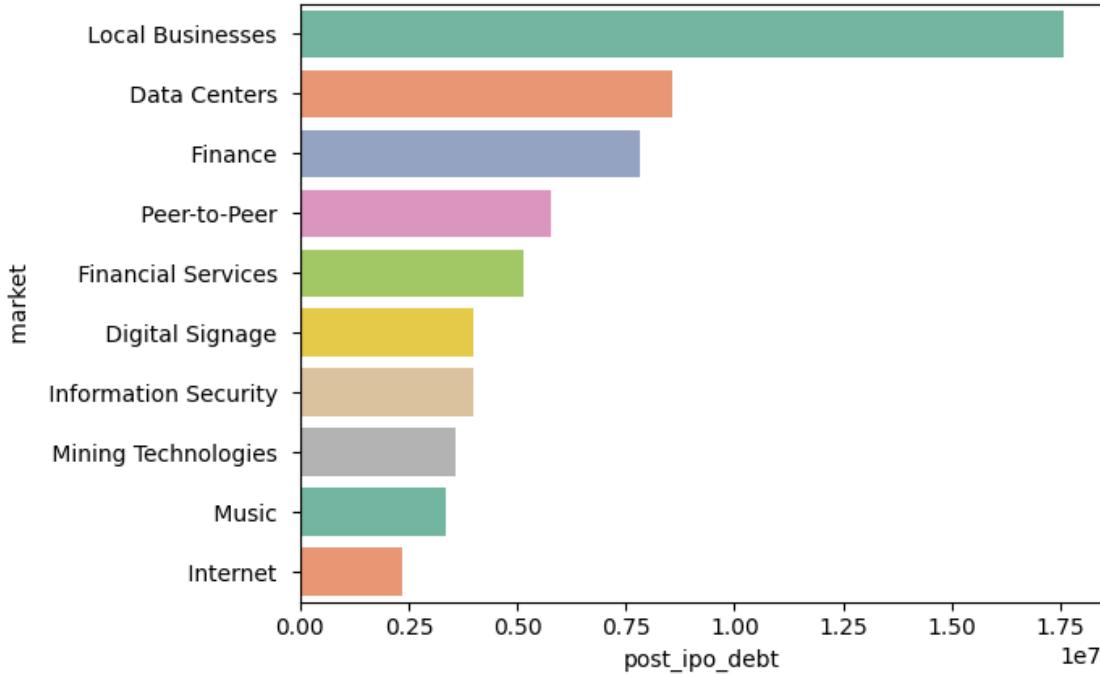
```
[ ]: <Axes: xlabel='post_ipo_debt', ylabel=' market '>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of avergae funding rounds.

```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'mean'}).reset_index()
      ↪sort_values(column,ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

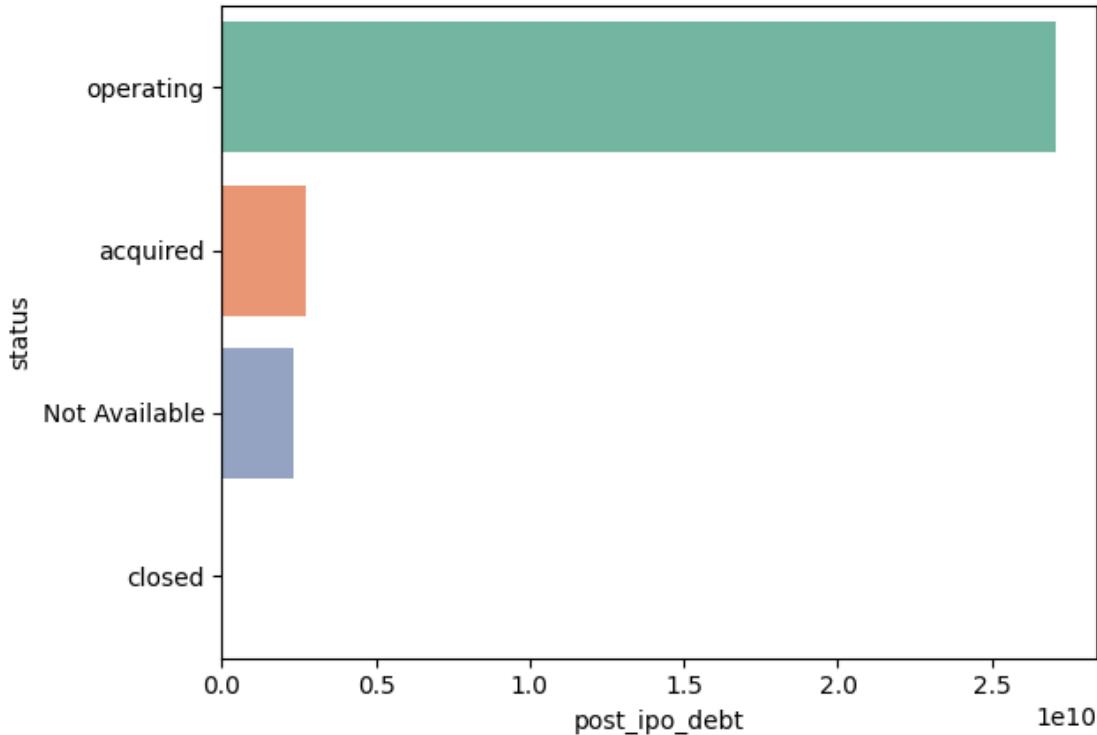
```
[ ]: <Axes: xlabel='post_ipo_debt', ylabel=' market '>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of avergae funding rounds.

```
[ ]: df_plot = df_clean.groupby('status').agg({column:'sum'}).reset_index()
      ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

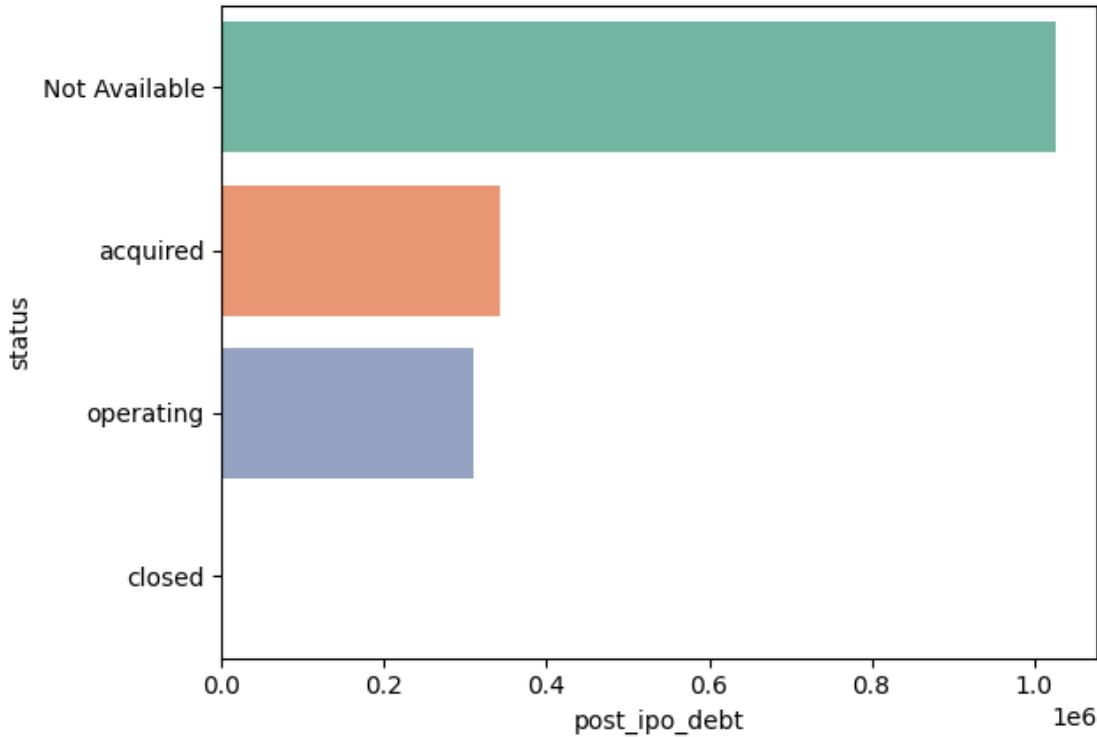
```
[ ]: <Axes: xlabel='post_ipo_debt', ylabel='status'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('status').agg({column:'mean'}).reset_index()
      ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')

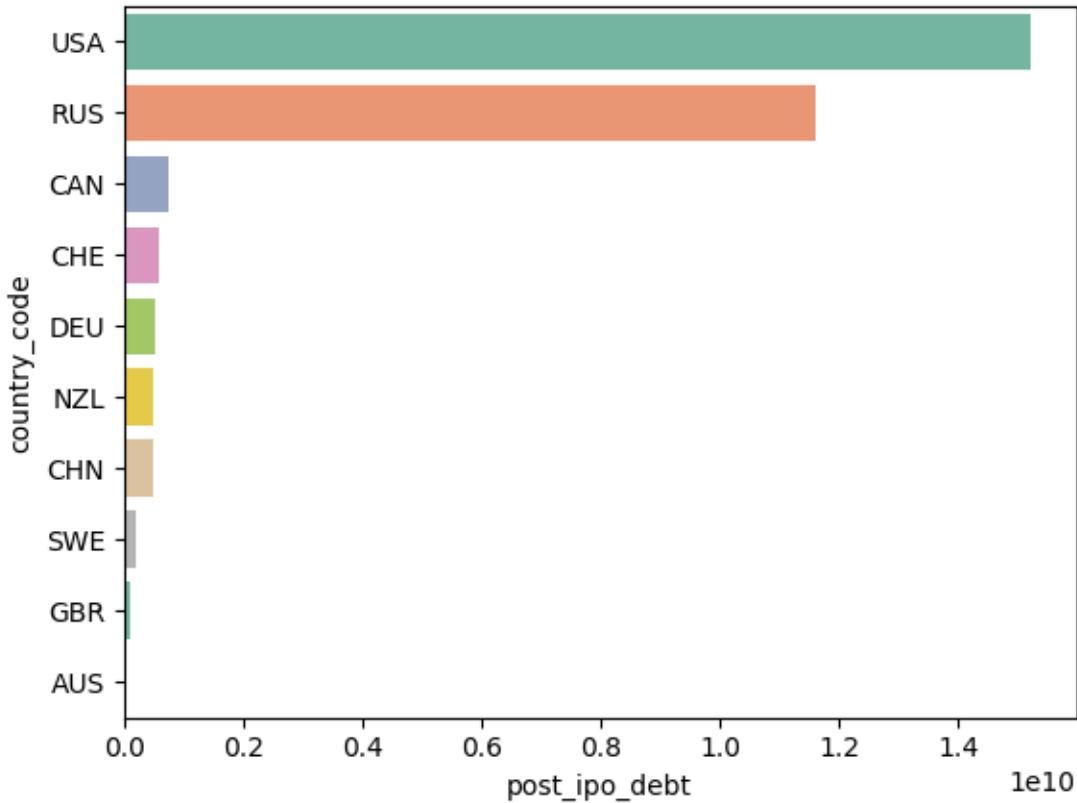
[ ]: <Axes: xlabel='post_ipo_debt', ylabel='status'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['country_code']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

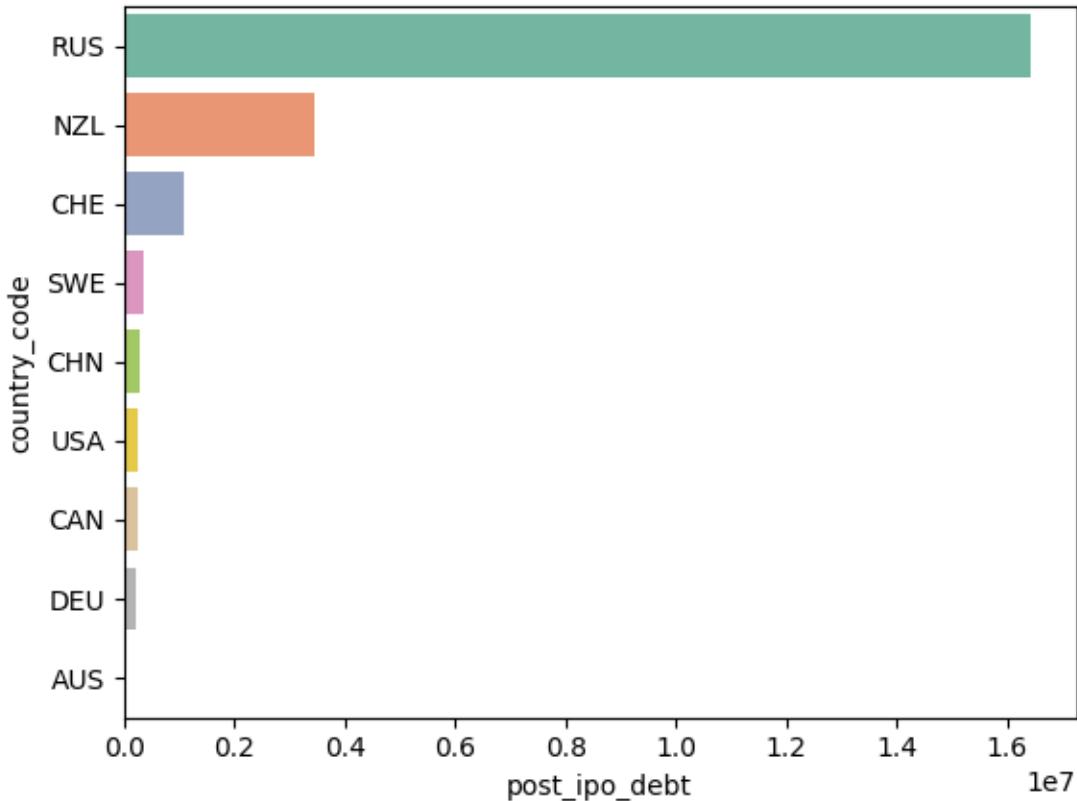
```
[ ]: <Axes: xlabel='post_ipo_debt', ylabel='country_code'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'mean'}).reset_index().
    ↪sort_values(column, ascending=False).head(10)
df_plot = df_plot[df_plot['country_code']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

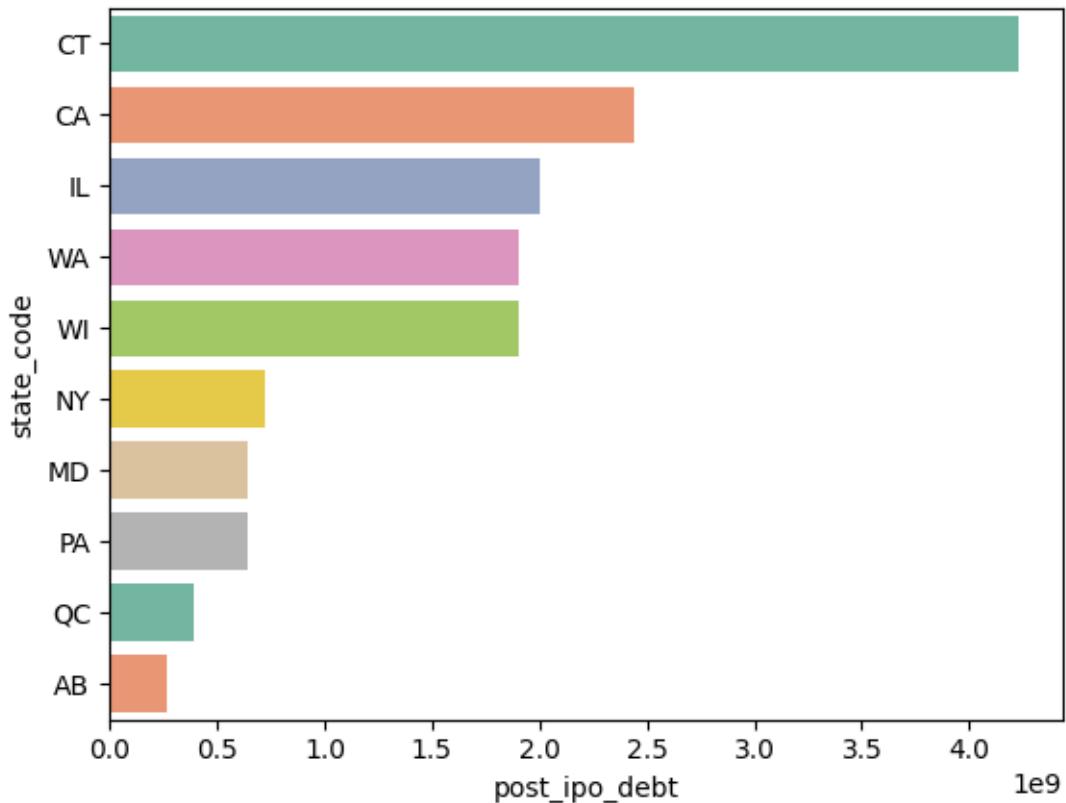
```
[ ]: <Axes: xlabel='post_ipo_debt', ylabel='country_code'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'sum'}).reset_index()
      ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['state_code']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

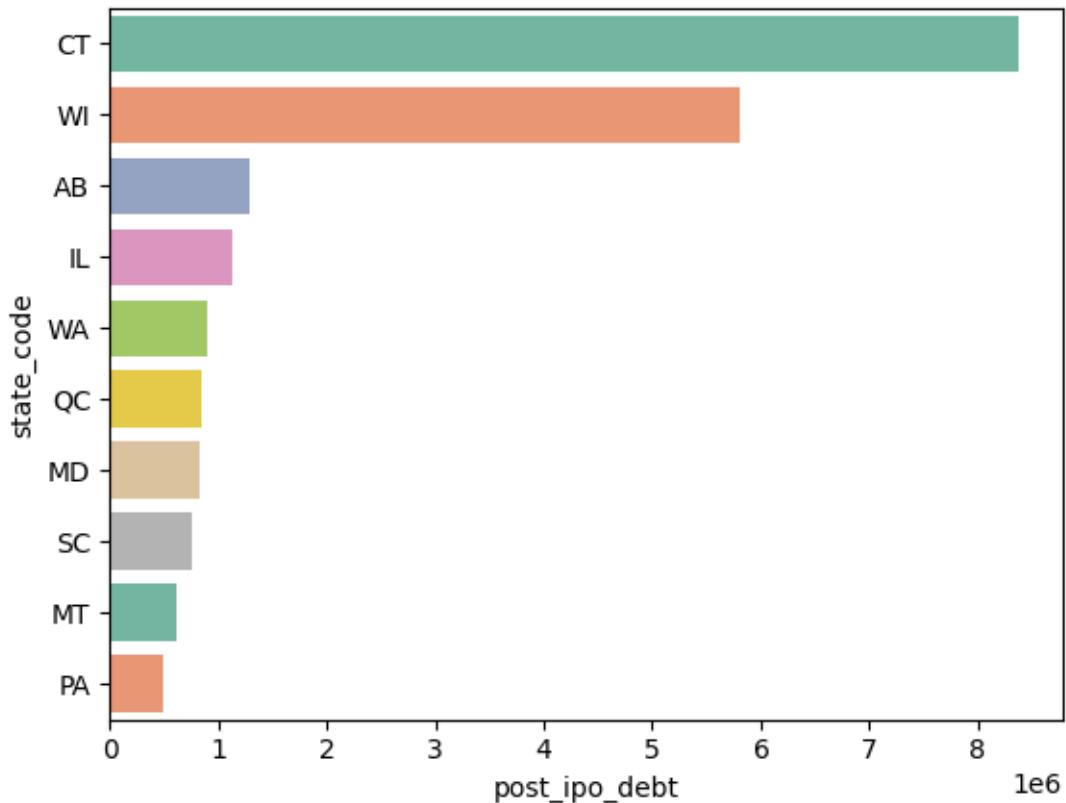
```
[ ]: <Axes: xlabel='post_ipo_debt', ylabel='state_code'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'mean'}).reset_index().
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['state_code']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

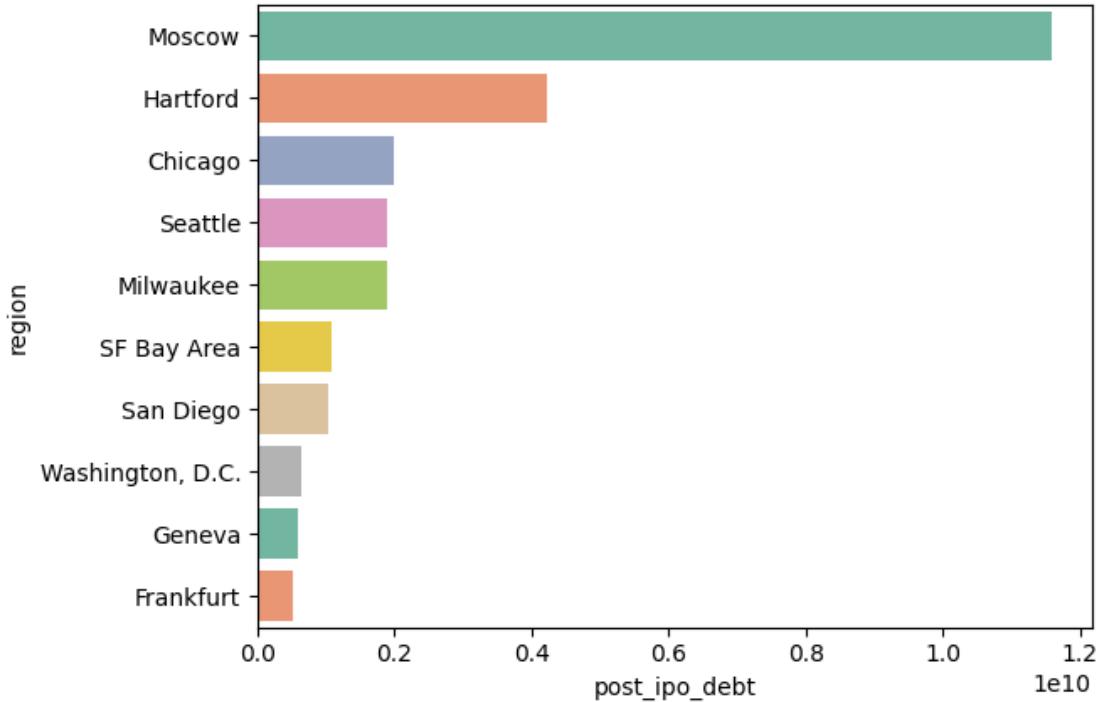
```
[ ]: <Axes: xlabel='post_ipo_debt', ylabel='state_code'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('region').agg({column:'sum'}).reset_index().
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

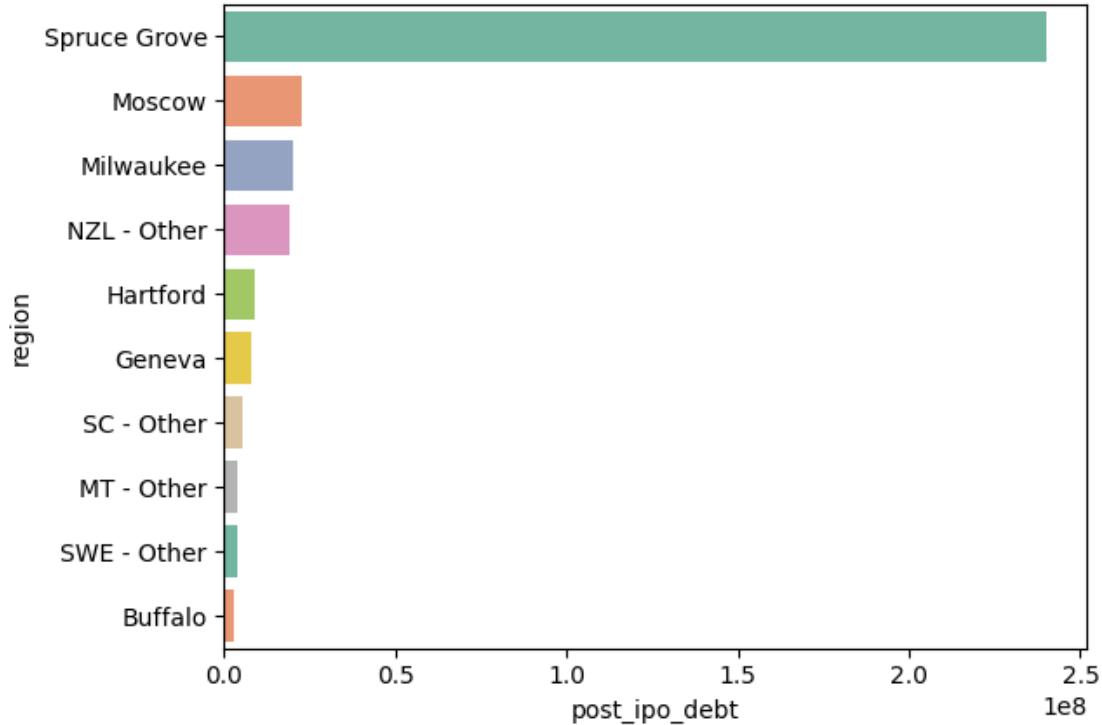
```
[ ]: <Axes: xlabel='post_ipo_debt', ylabel='region'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('region').agg({column:'mean'}).reset_index()
      ↪sort_values(column, ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')

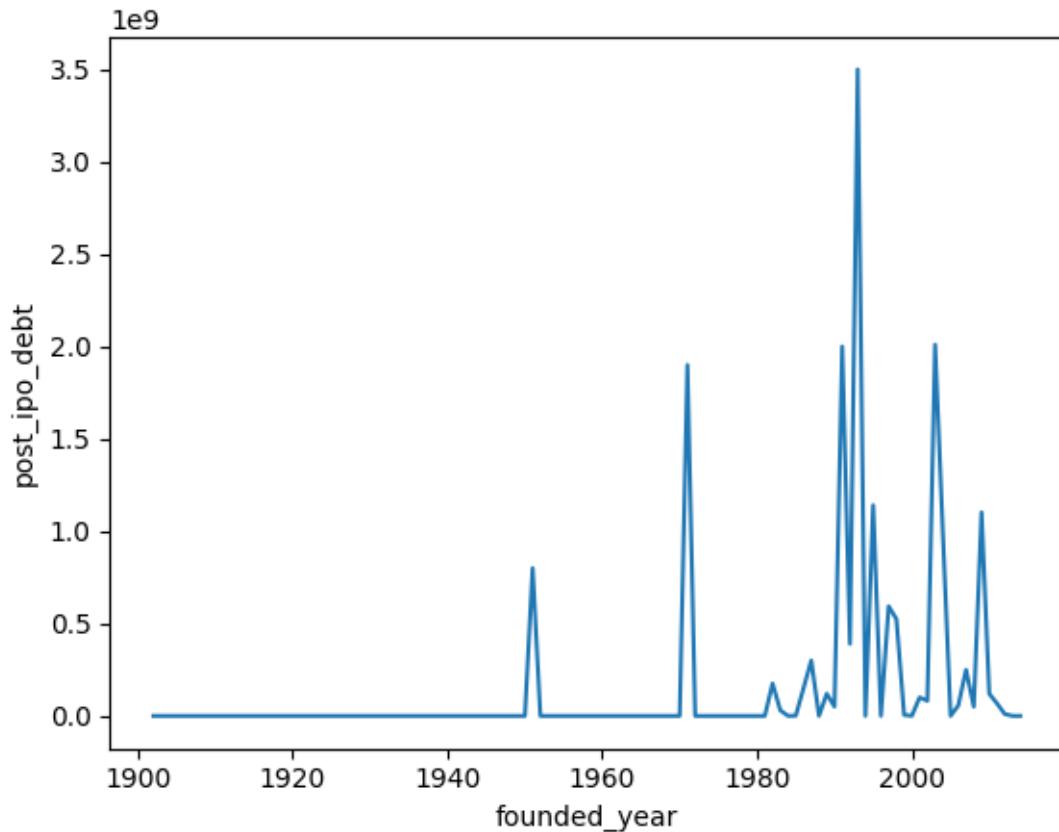
[ ]: <Axes: xlabel='post_ipo_debt', ylabel='region'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column: 'sum'}).reset_index()
     ↪sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

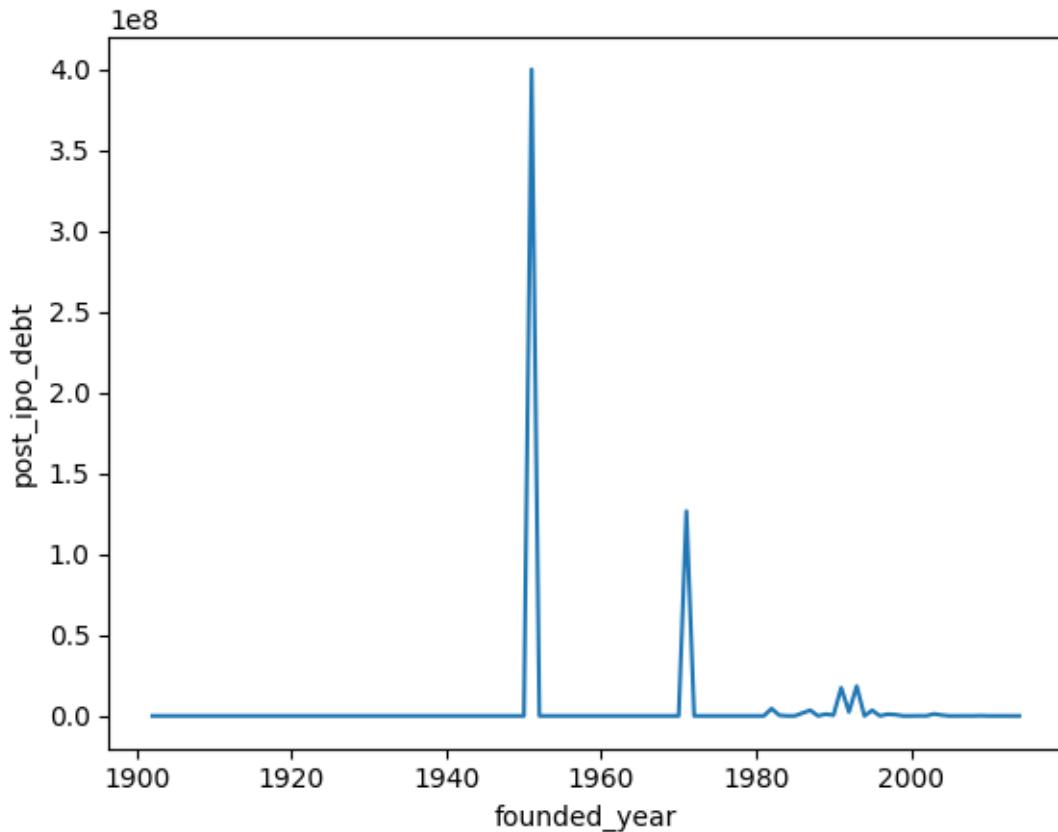
```
[ ]: <Axes: xlabel='founded_year', ylabel='post_ipo_debt'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'mean'}).reset_index().  
      ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

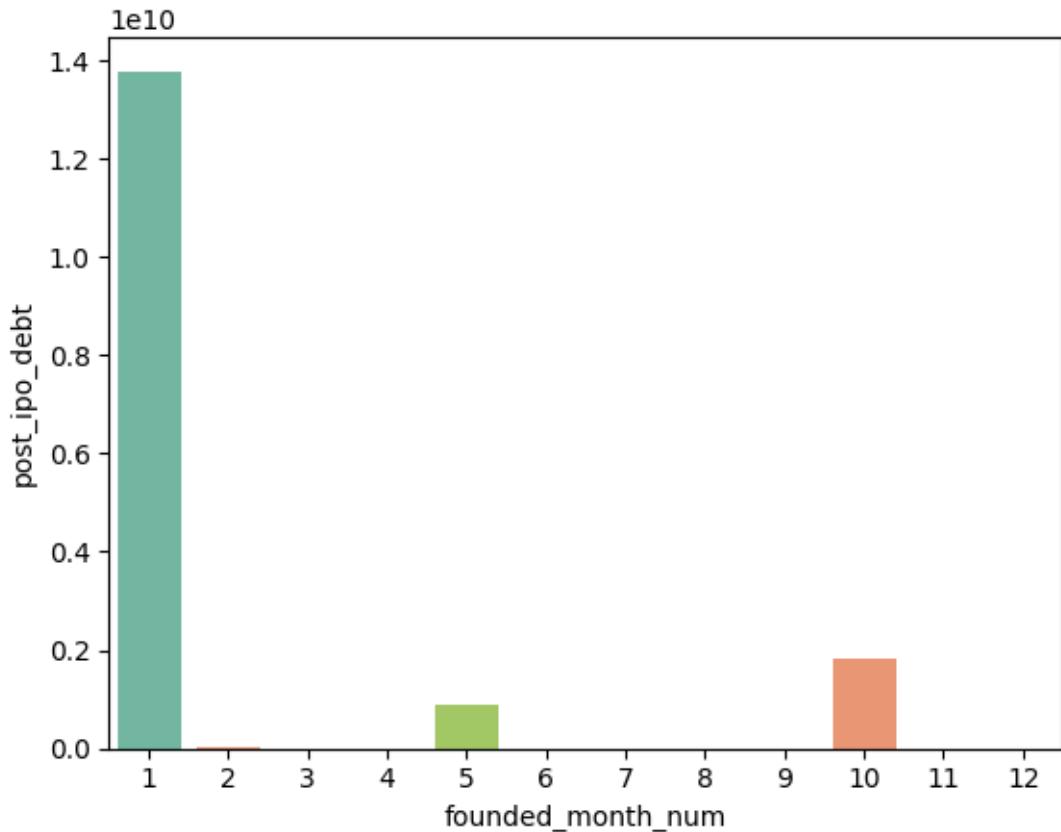
```
[ ]: <Axes: xlabel='founded_year', ylabel='post_ipo_debt'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_month_num'] > 0]  
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

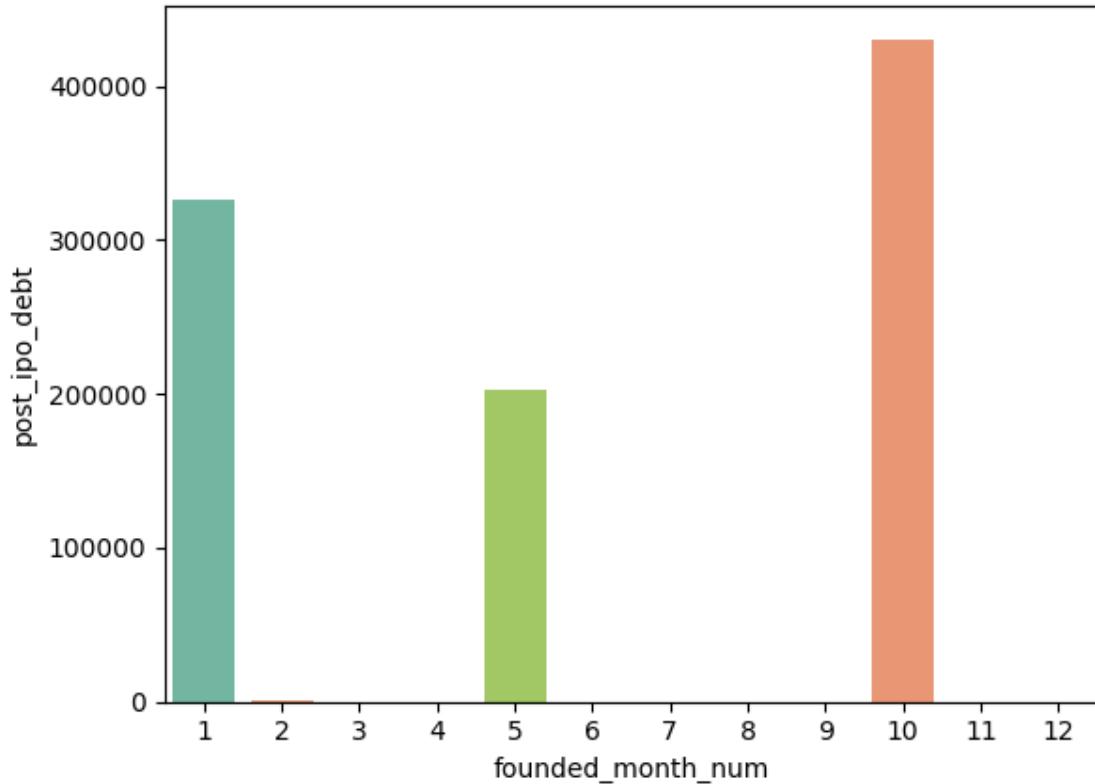
```
[ ]: <Axes: xlabel='founded_month_num', ylabel='post_ipo_debt'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

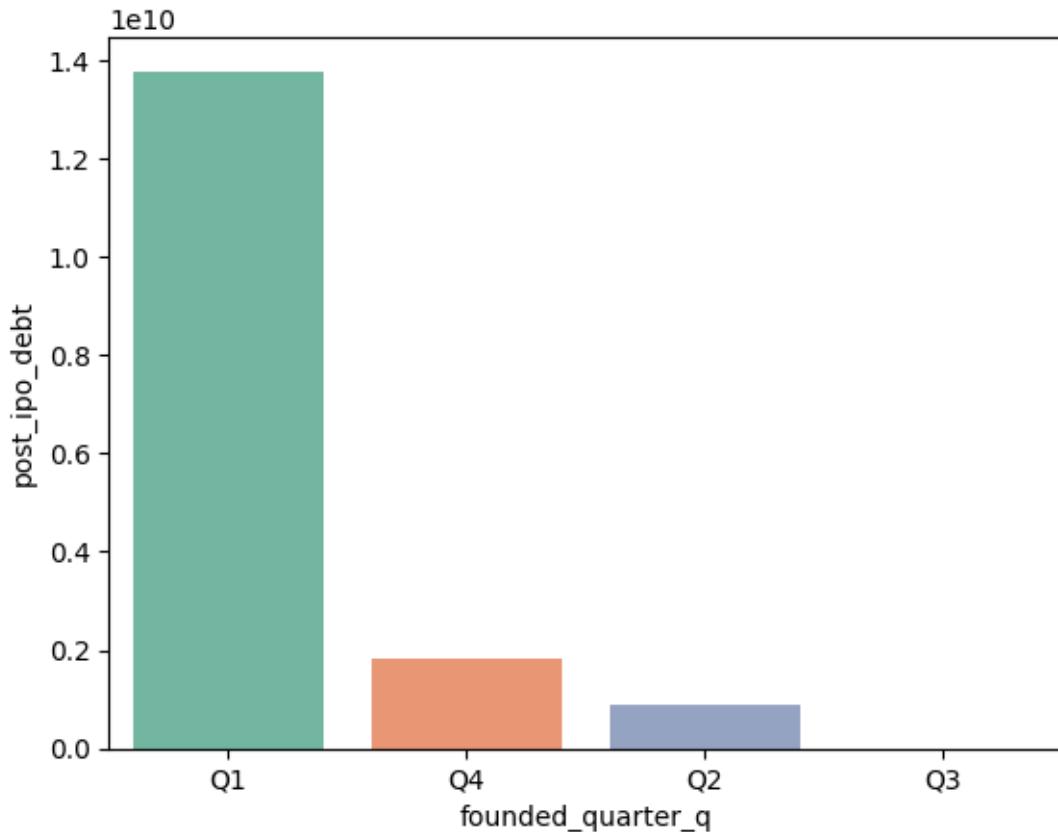
```
[ ]: <Axes: xlabel='founded_month_num', ylabel='post_ipo_debt'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of avergae funding rounds.

```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'sum'}).
      ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q']!= 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')

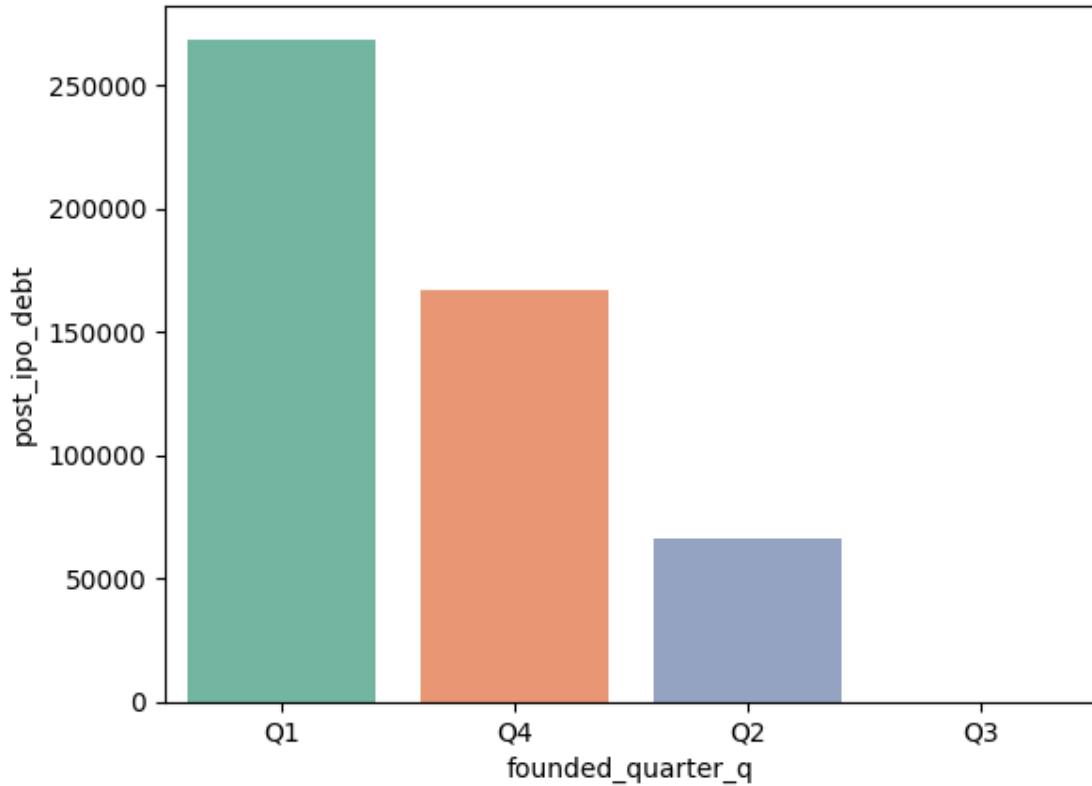
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='post_ipo_debt'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'mean'}).
      ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

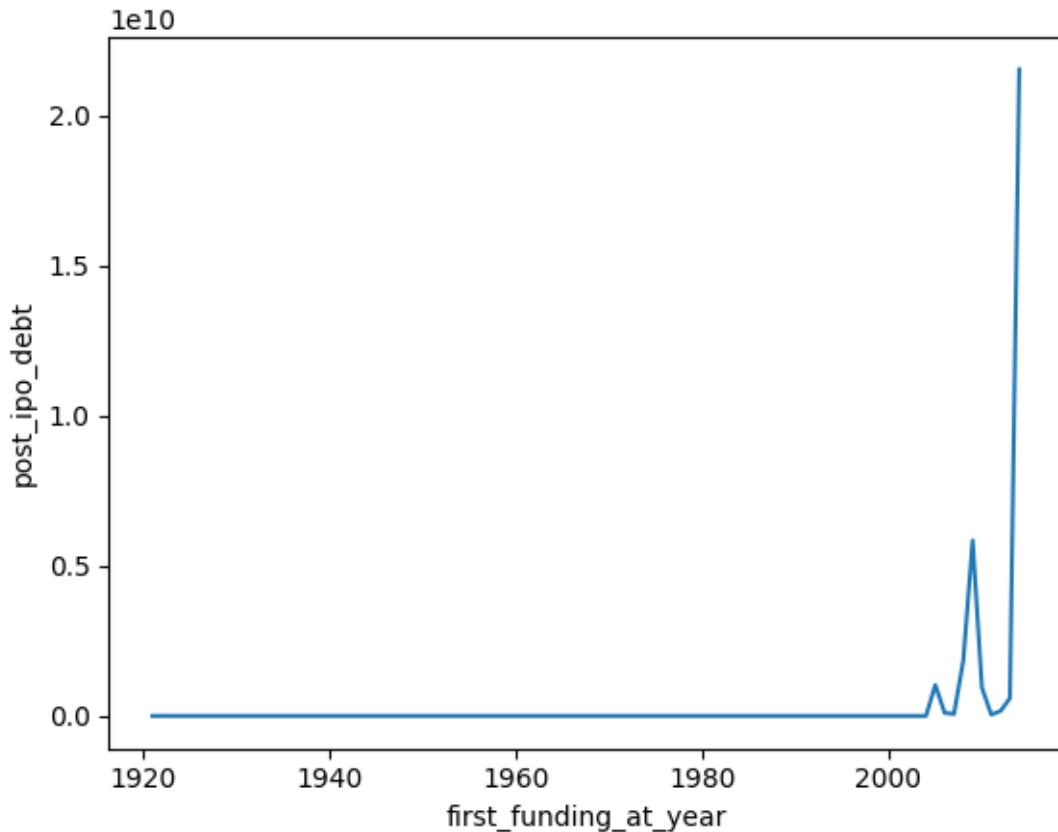
```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='post_ipo_debt'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'sum'}).
      ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

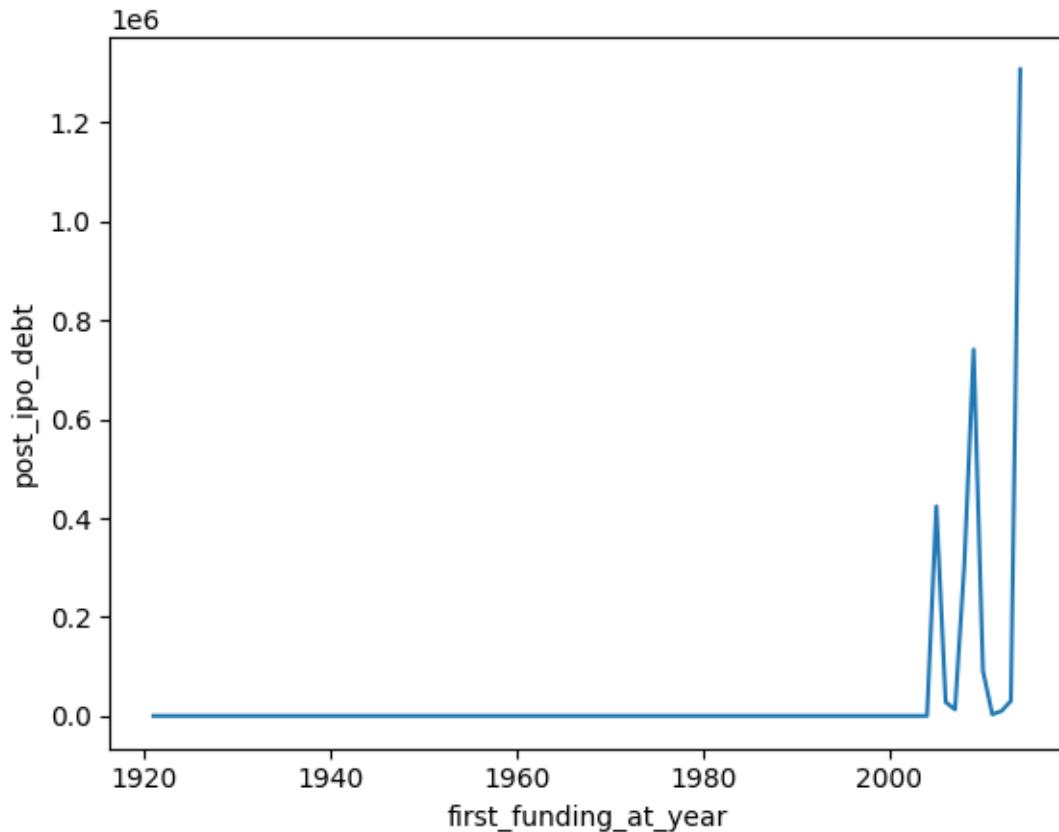
```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='post_ipo_debt'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

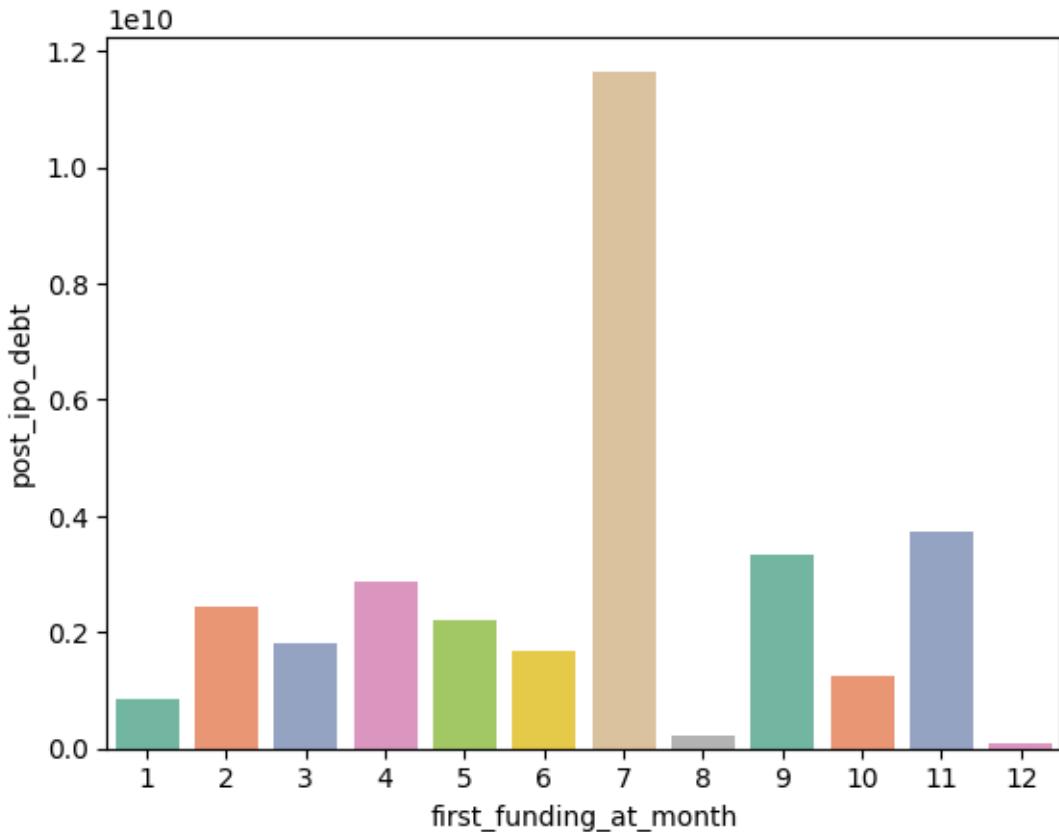
```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='post_ipo_debt'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('first_funding_at_month').agg({column:'sum'}).
    ↪reset_index().sort_values(column,ascending=False)
sns.barplot(y=df_plot[column],u
    ↪x=df_plot['first_funding_at_month'],palette='Set2')
```

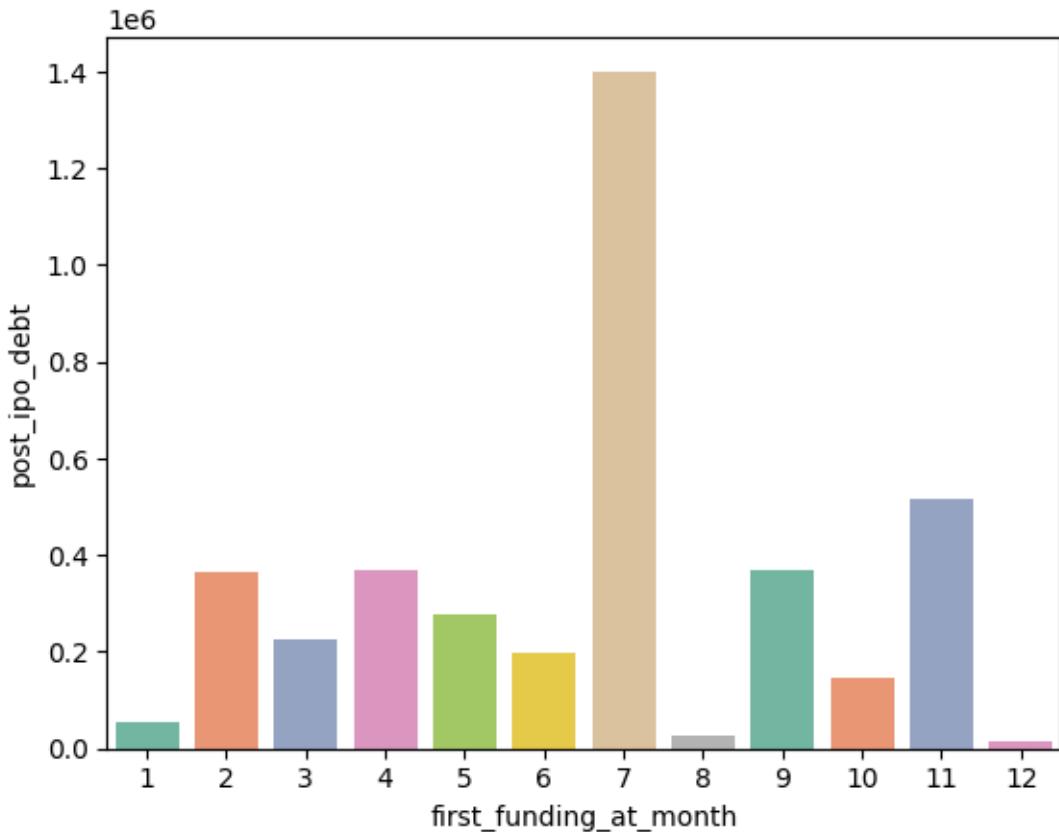
```
[ ]: <Axes: xlabel='first_funding_at_month', ylabel='post_ipo_debt'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('first_funding_at_month').agg({column:'mean'}).
    ↪reset_index().sort_values(column,ascending=False)
sns.barplot(y=df_plot[column],_
    ↪x=df_plot['first_funding_at_month'],palette='Set2')
```

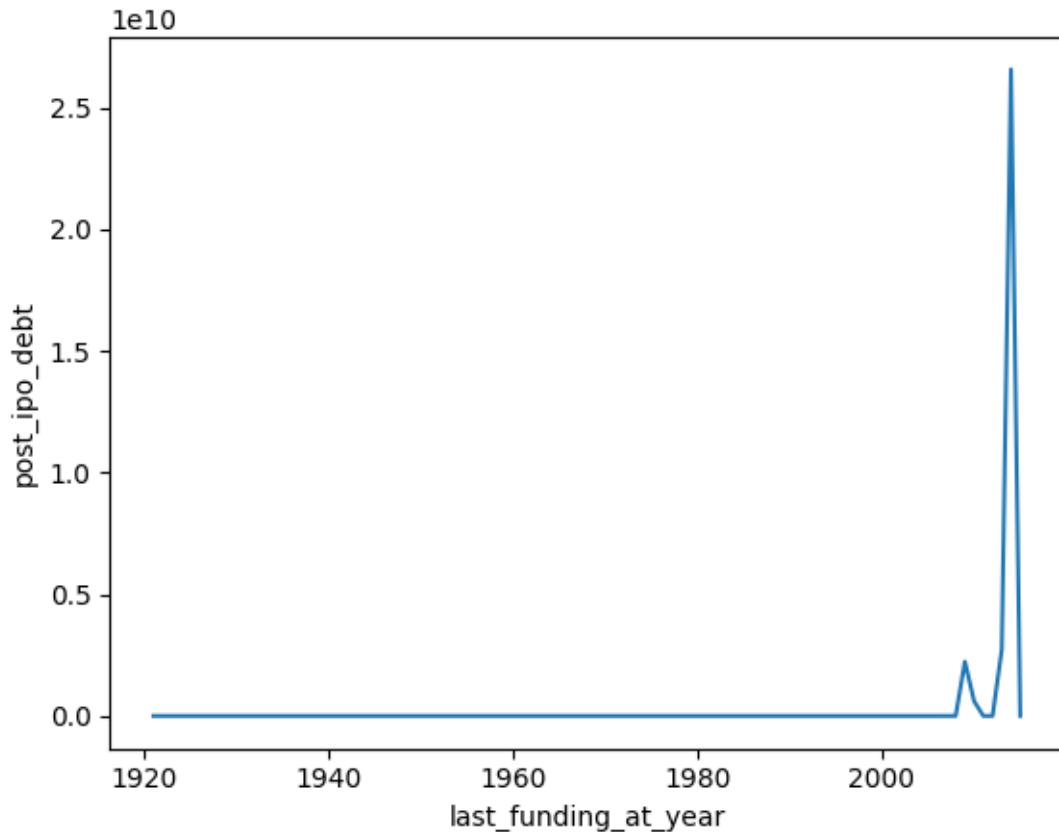
```
[ ]: <Axes: xlabel='first_funding_at_month', ylabel='post_ipo_debt'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

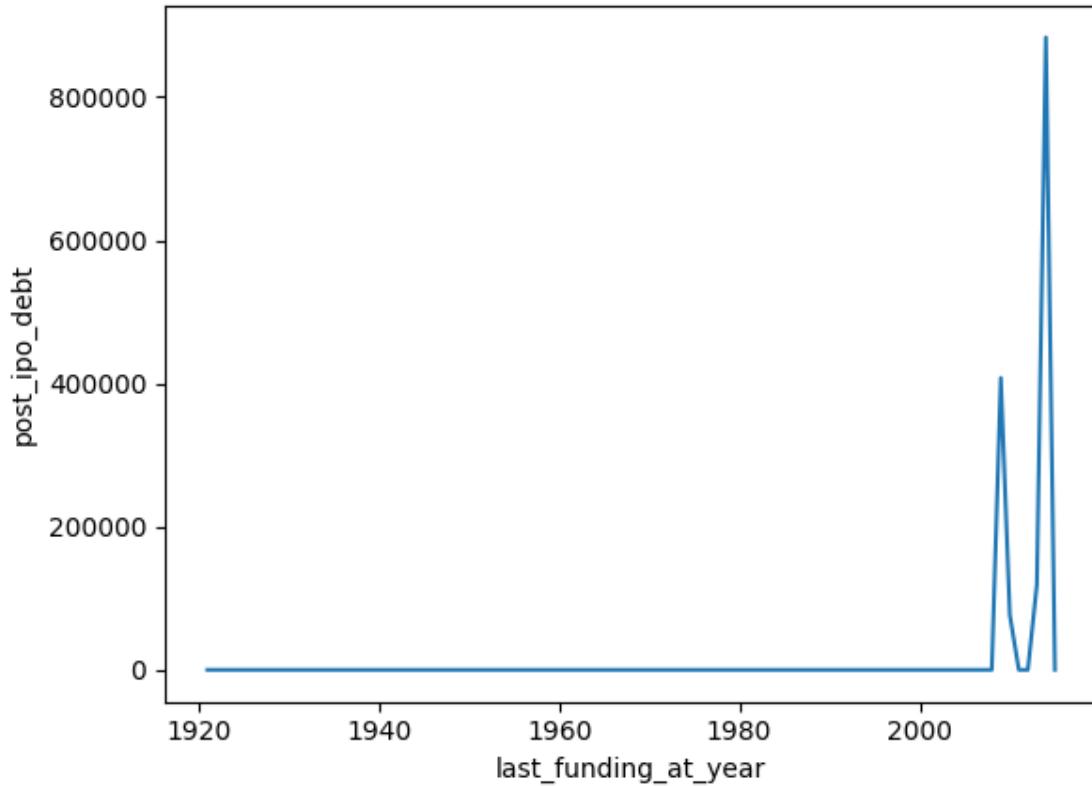
```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='post_ipo_debt'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'mean'}).
    ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

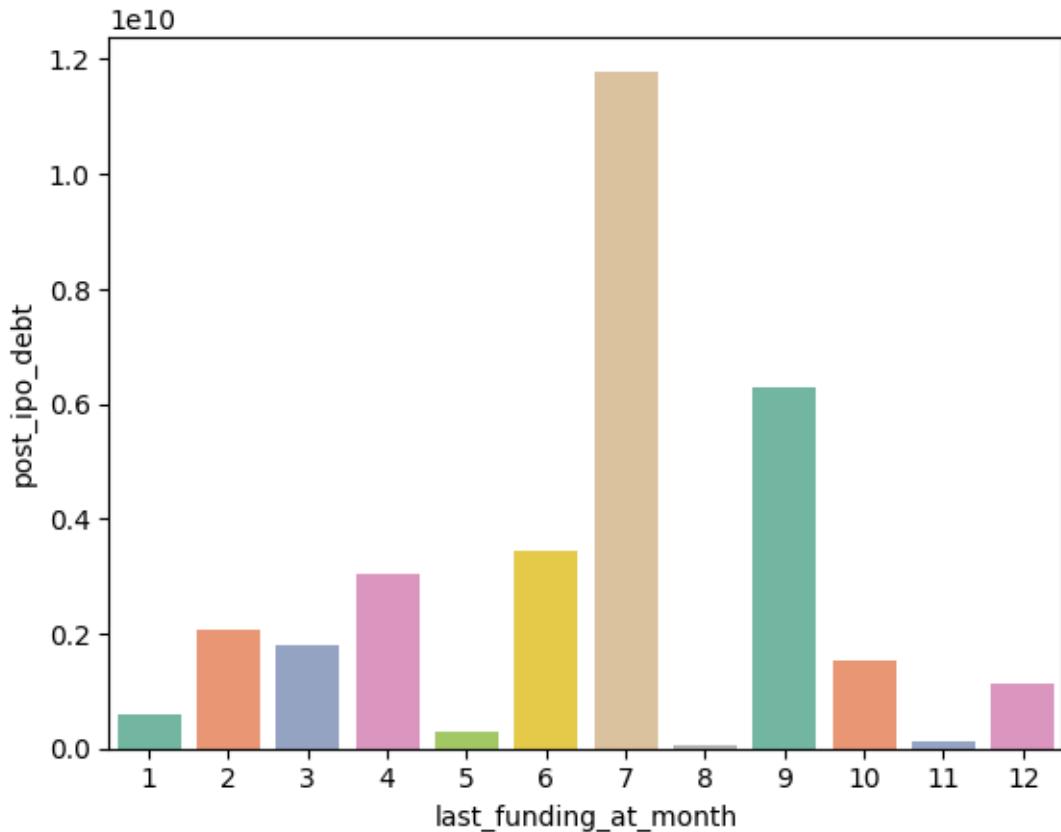
```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='post_ipo_debt'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of avergae funding rounds.

```
[ ]: df_plot = df_clean.groupby('last_funding_at_month').agg({column:'sum'}).
    ↪reset_index().sort_values(column,ascending=False)
sns.barplot(y=df_plot[column], ↪
    ↪x=df_plot['last_funding_at_month'],palette='Set2')
```

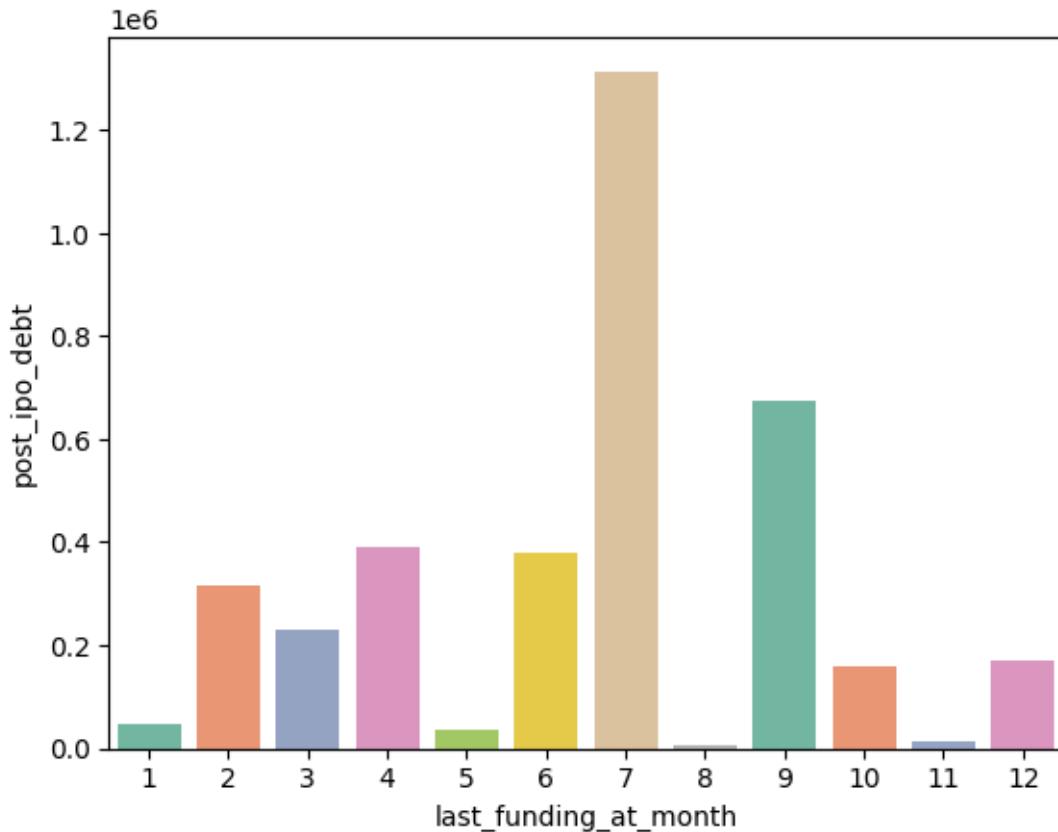
```
[ ]: <Axes: xlabel='last_funding_at_month', ylabel='post_ipo_debt'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

```
[ ]: df_plot = df_clean.groupby('last_funding_at_month').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
sns.barplot(y=df_plot[column], ↪
    ↪x=df_plot['last_funding_at_month'], palette='Set2')
```

```
[ ]: <Axes: xlabel='last_funding_at_month', ylabel='post_ipo_debt'>
```



Insights: From the plot of top 10 categories Biotechnology have the largest number of average funding rounds.

## 1.16 Secondary Market Funds

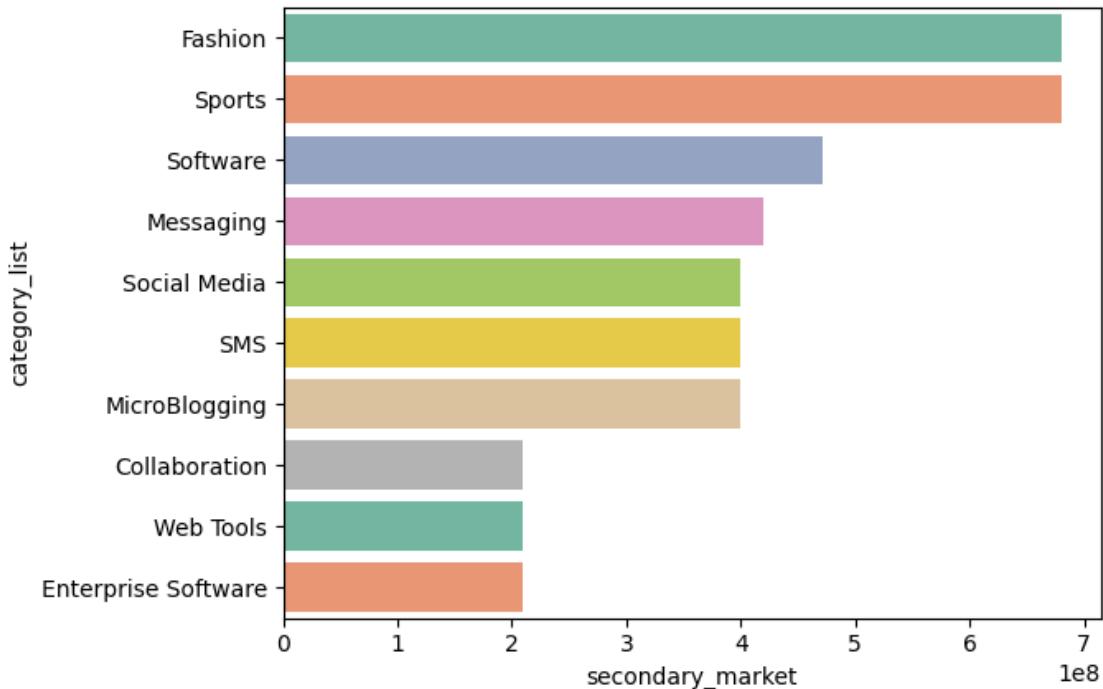
1. Secondary market funding is the buying and selling of previously issued securities in a financial market, also known as the aftermarket.
2. The secondary market is different from the primary market, where the issuer sells securities directly to a purchaser.

Average and Total Analysis of the Secondary Market Funds as shown below.

```
[ ]: column = 'secondary_market'

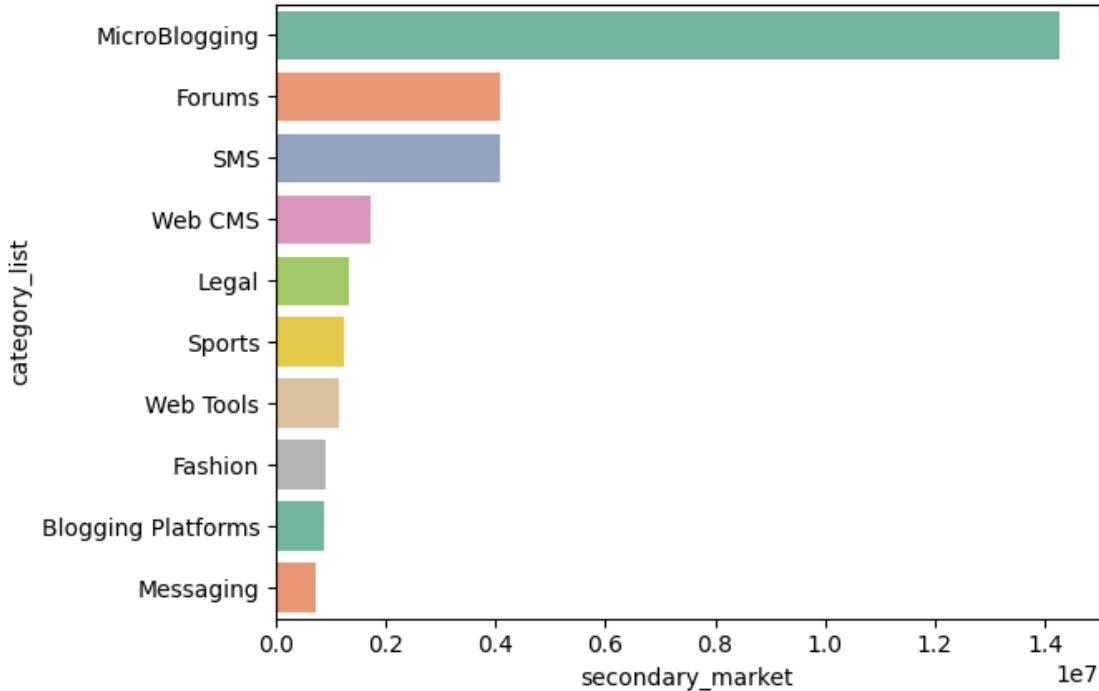
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'sum'}).reset_index() .
    .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')

[ ]: <Axes: xlabel='secondary_market', ylabel='category_list'>
```



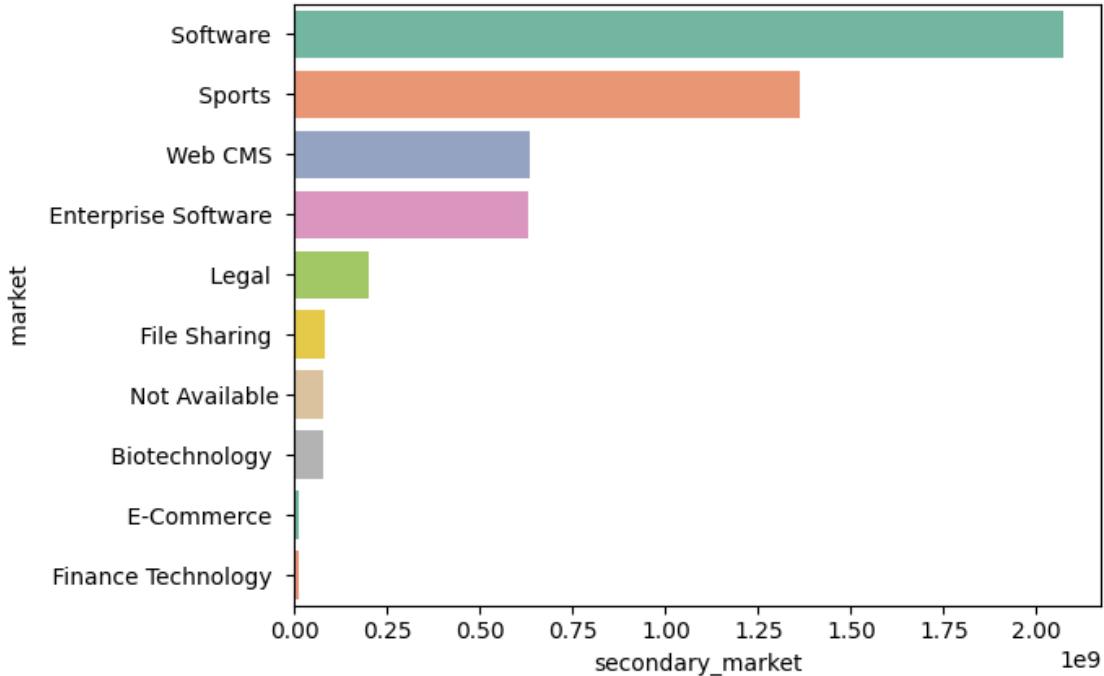
```
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')
```

```
[ ]: <Axes: xlabel='secondary_market', ylabel='category_list'>
```



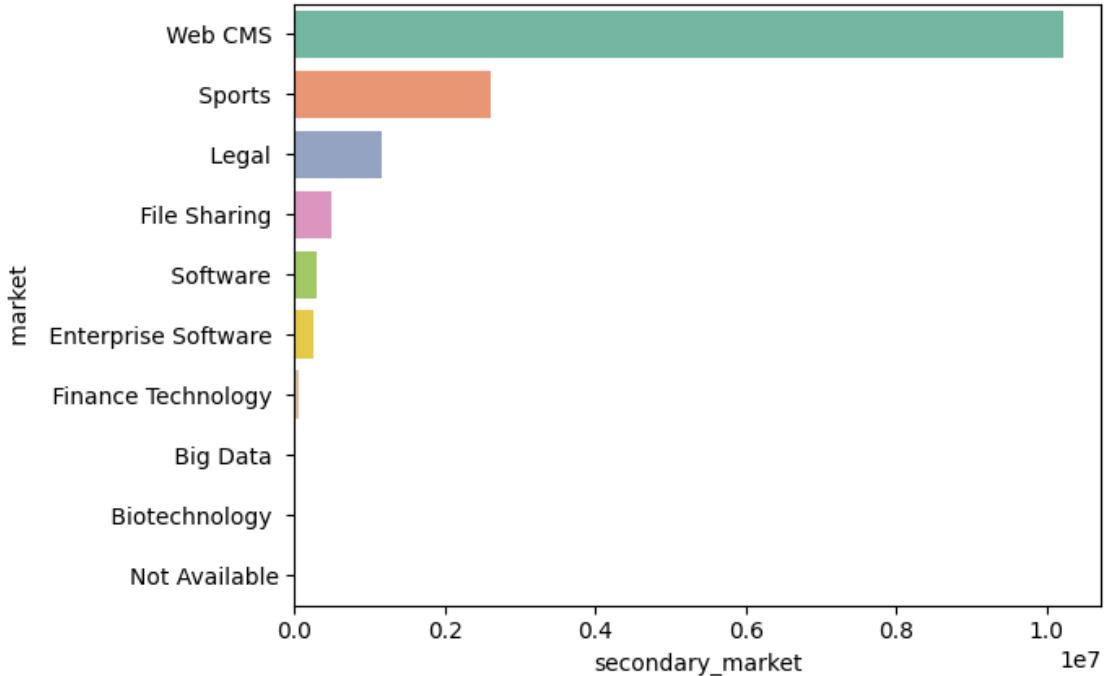
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'sum'}).reset_index().  
     ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='secondary_market', ylabel=' market '>
```



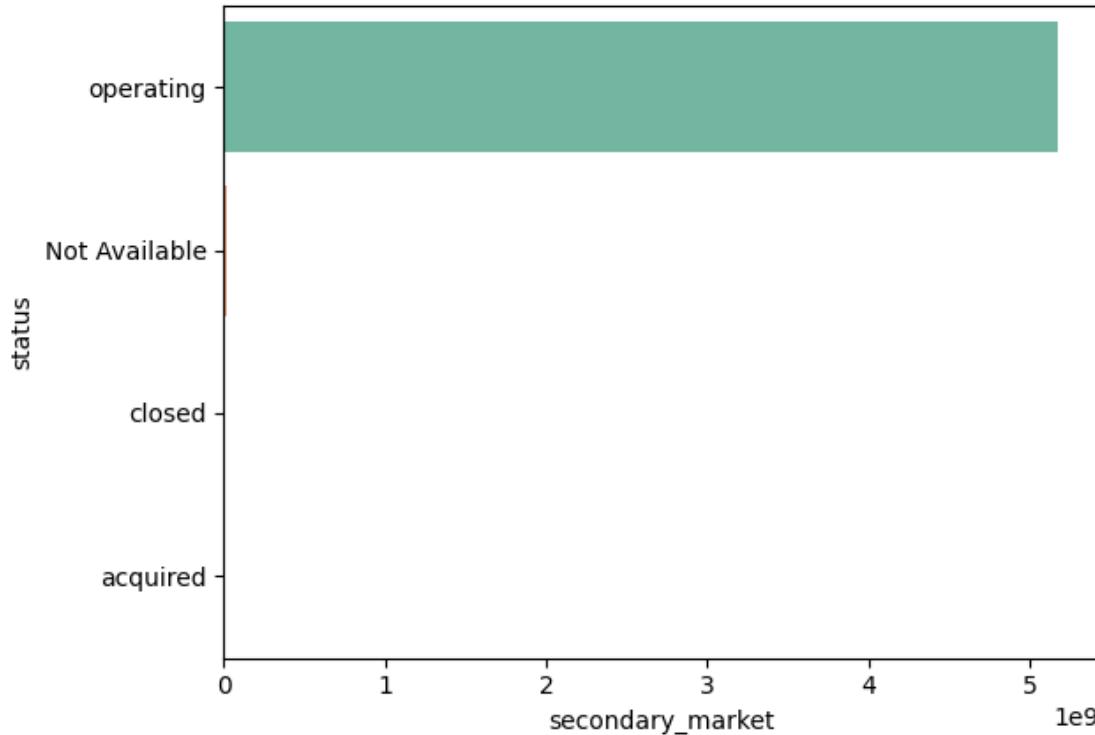
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'mean'}).reset_index().  
     ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='secondary_market', ylabel=' market '>
```



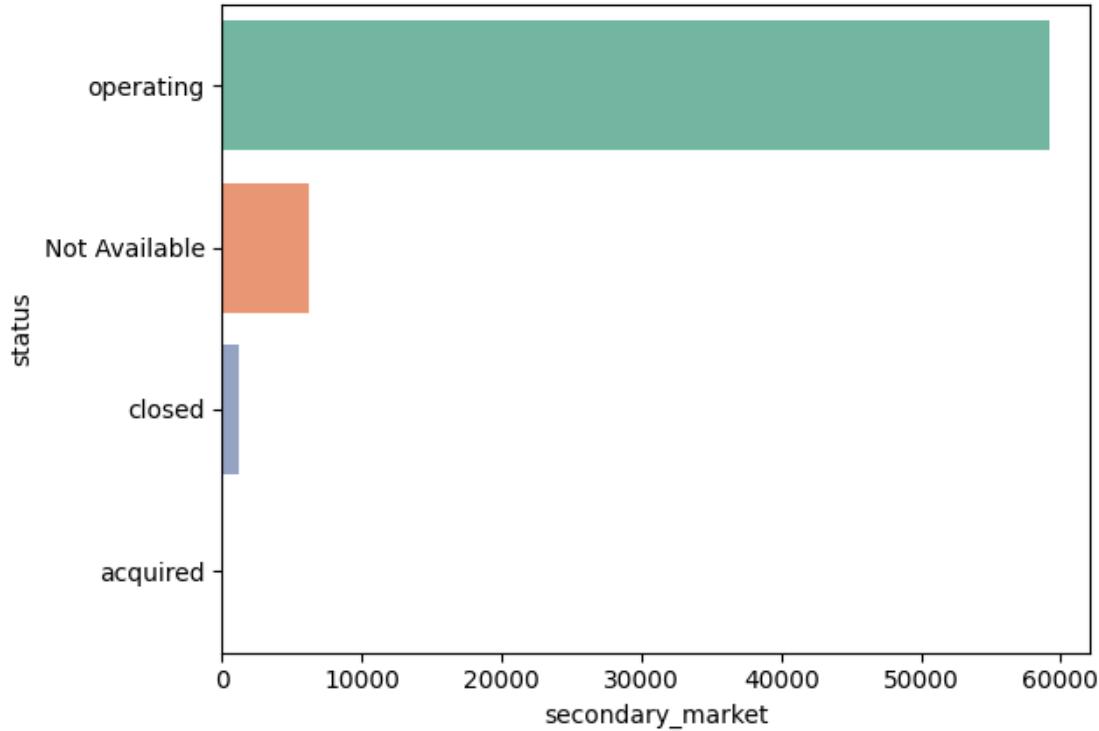
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'sum'}).reset_index() .
    ↪sort_values(column,ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'],palette='Set2')
```

```
[ ]: <Axes: xlabel='secondary_market', ylabel='status'>
```



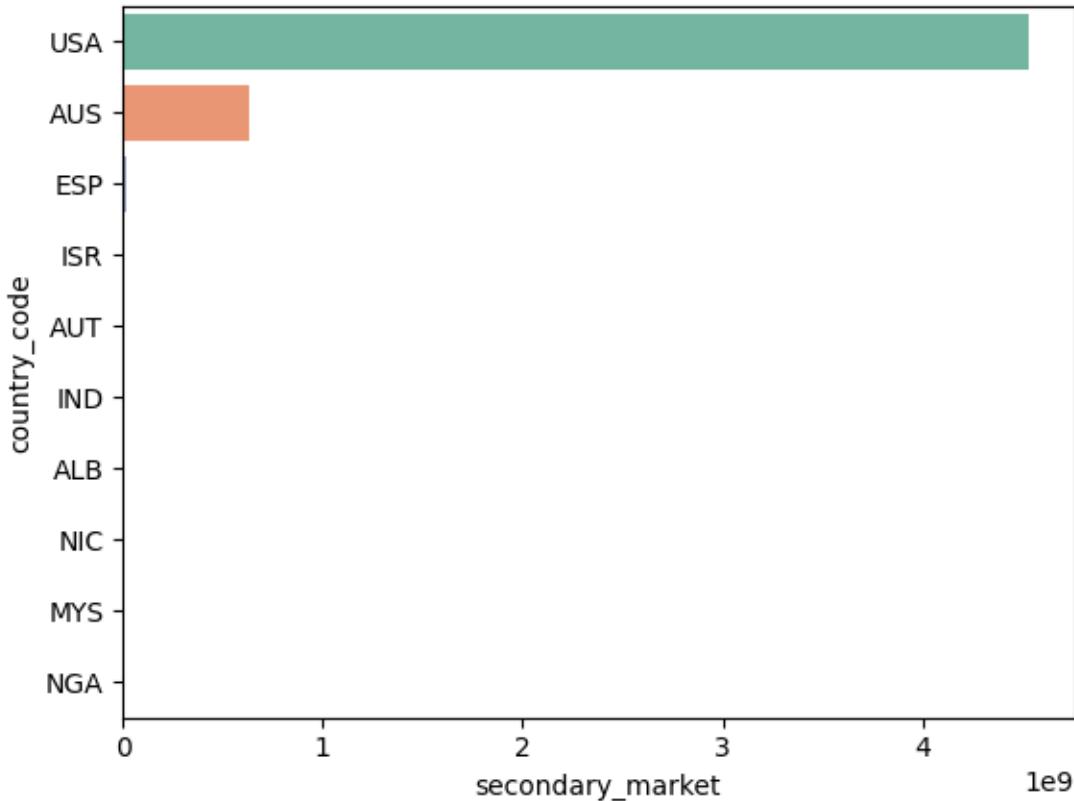
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'mean'}).reset_index()
      .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='secondary_market', ylabel='status'>
```



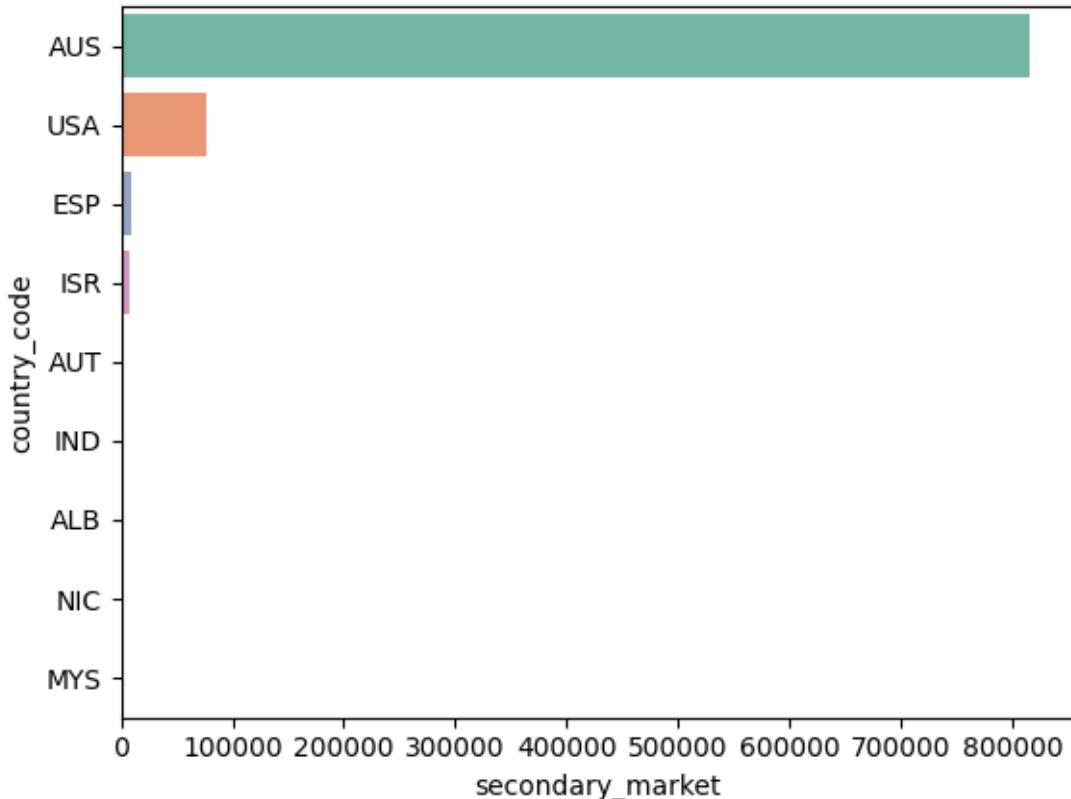
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='secondary_market', ylabel='country_code'>
```



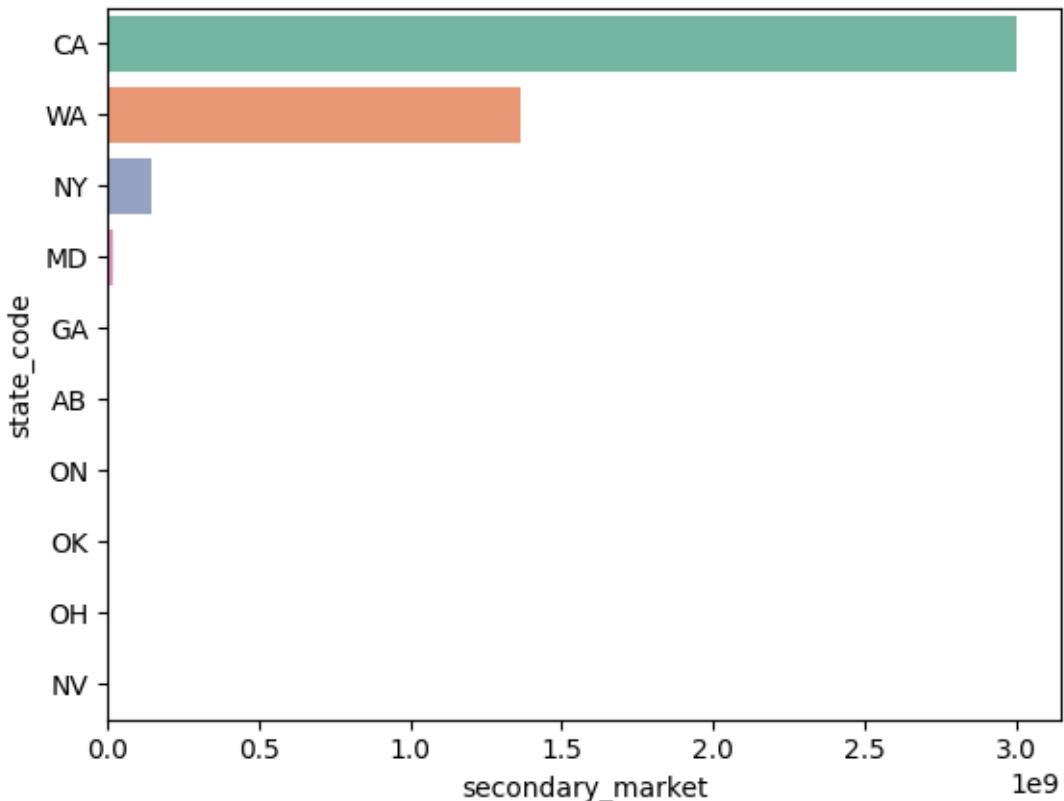
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='secondary_market', ylabel='country_code'>
```



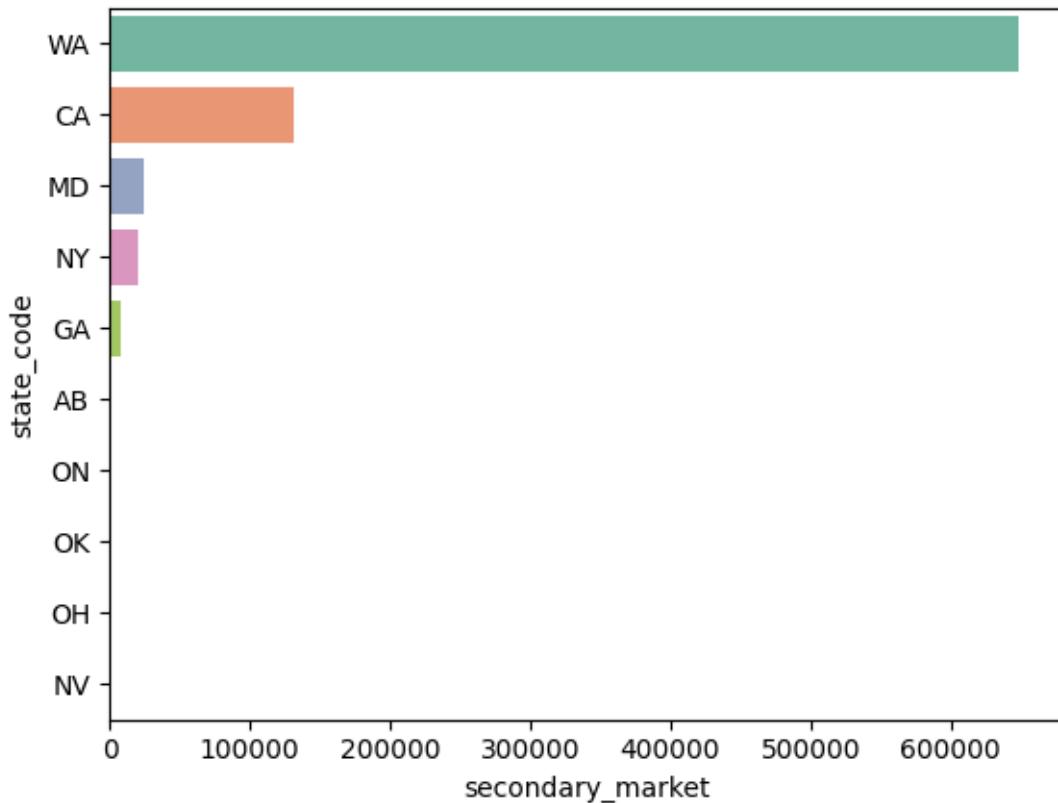
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column,ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'],palette='Set2')
```

```
[ ]: <Axes: xlabel='secondary_market', ylabel='state_code'>
```



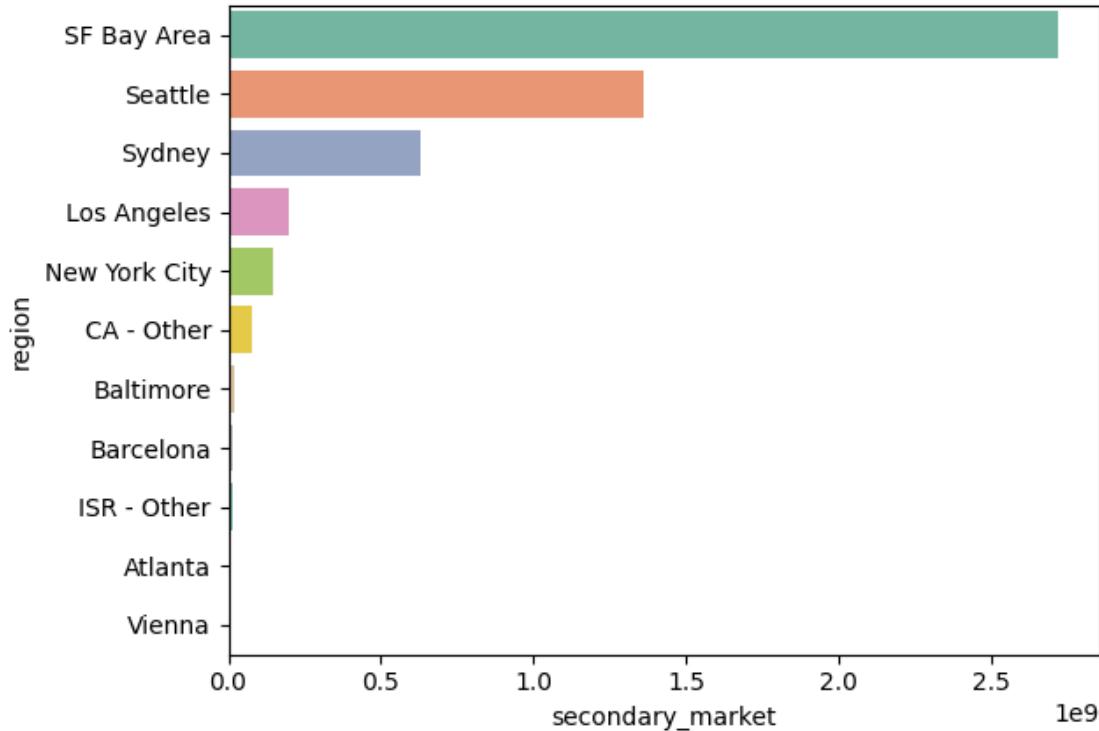
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'mean'}).reset_index().  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='secondary_market', ylabel='state_code'>
```



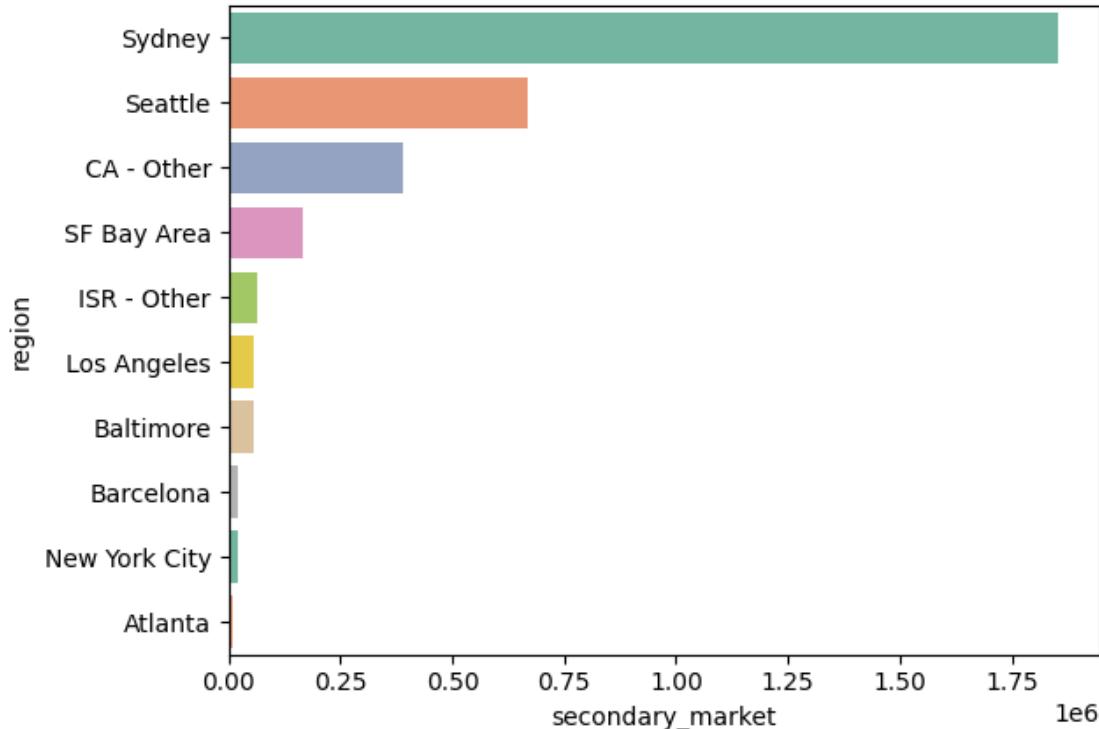
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'sum'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['region']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='secondary_market', ylabel='region'>
```



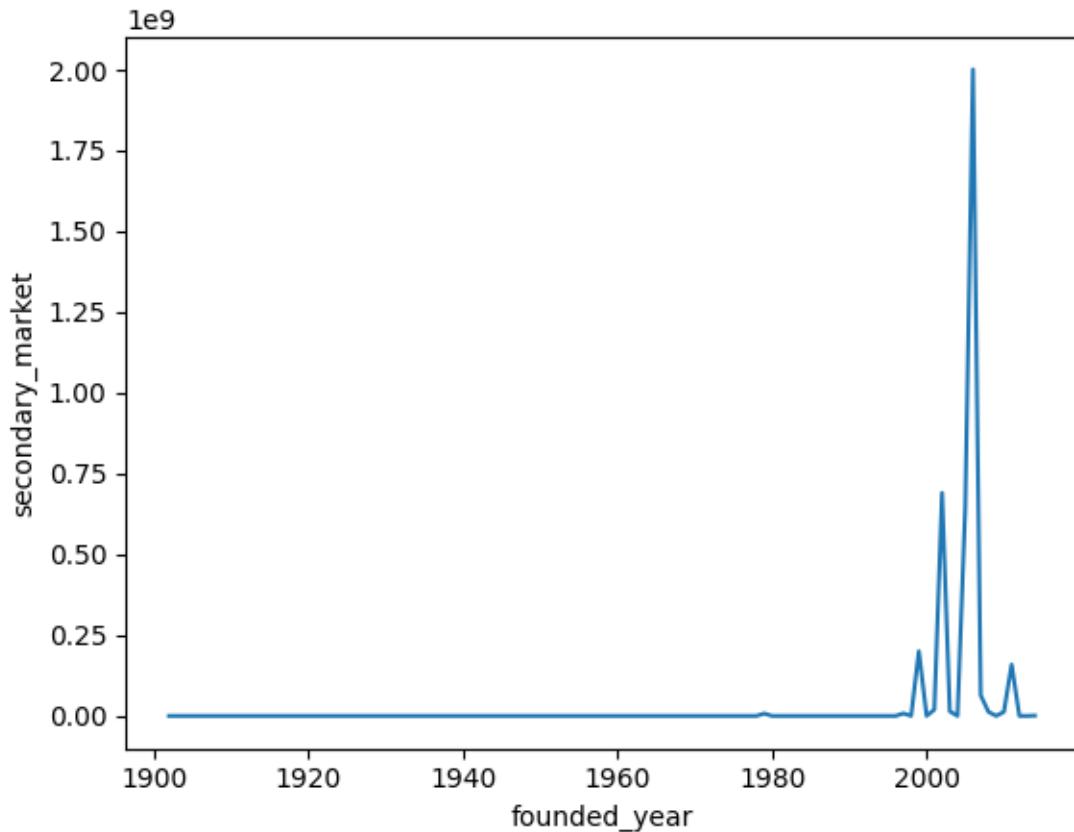
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'mean'}).reset_index()
      ↪sort_values(column, ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='secondary_market', ylabel='region'>
```



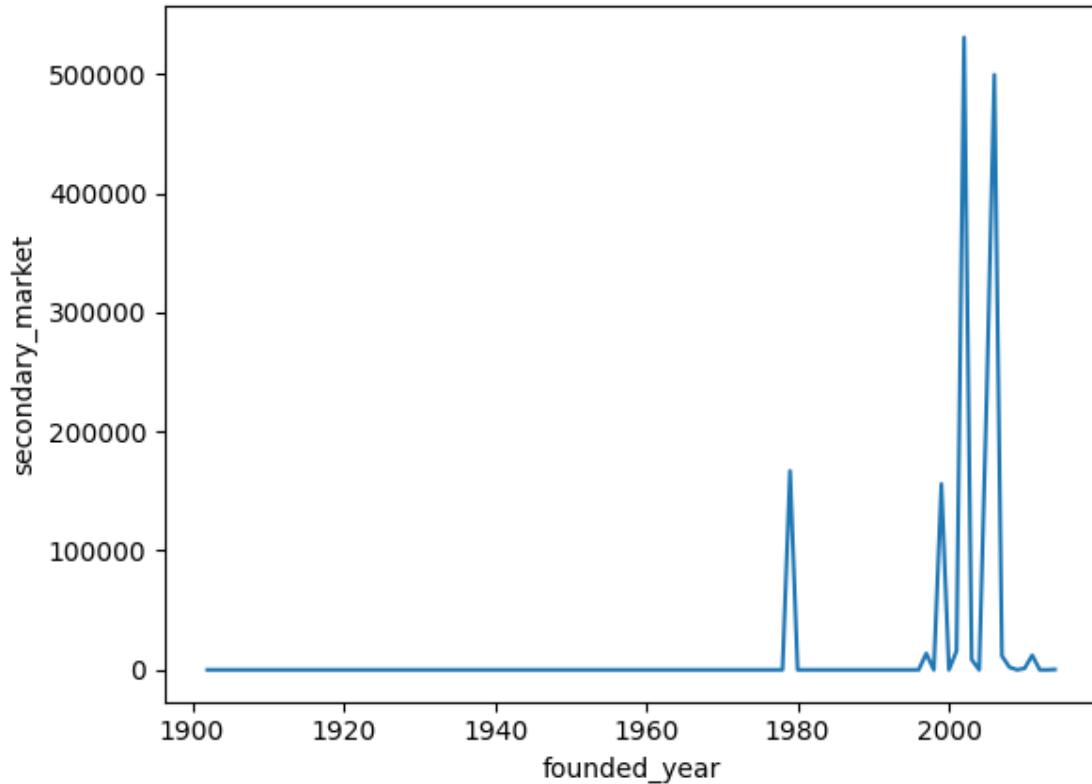
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'sum'}).reset_index().  
    ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='secondary_market'>
```



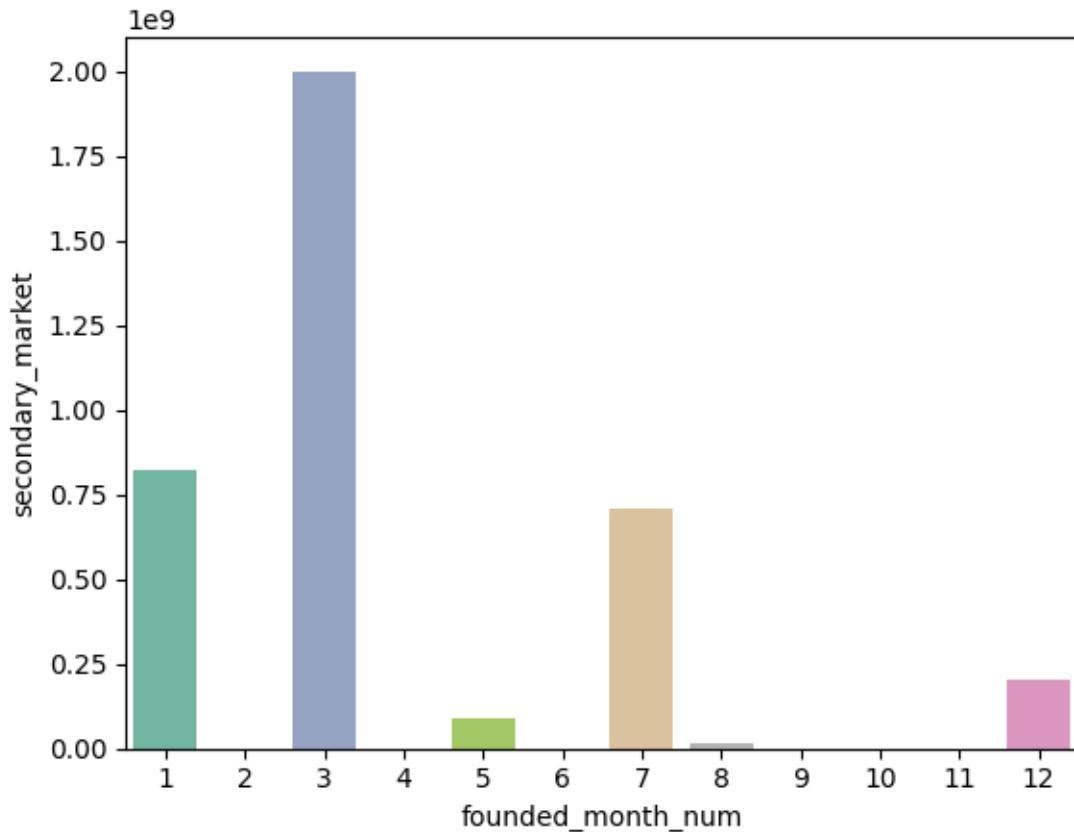
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='secondary_market'>
```



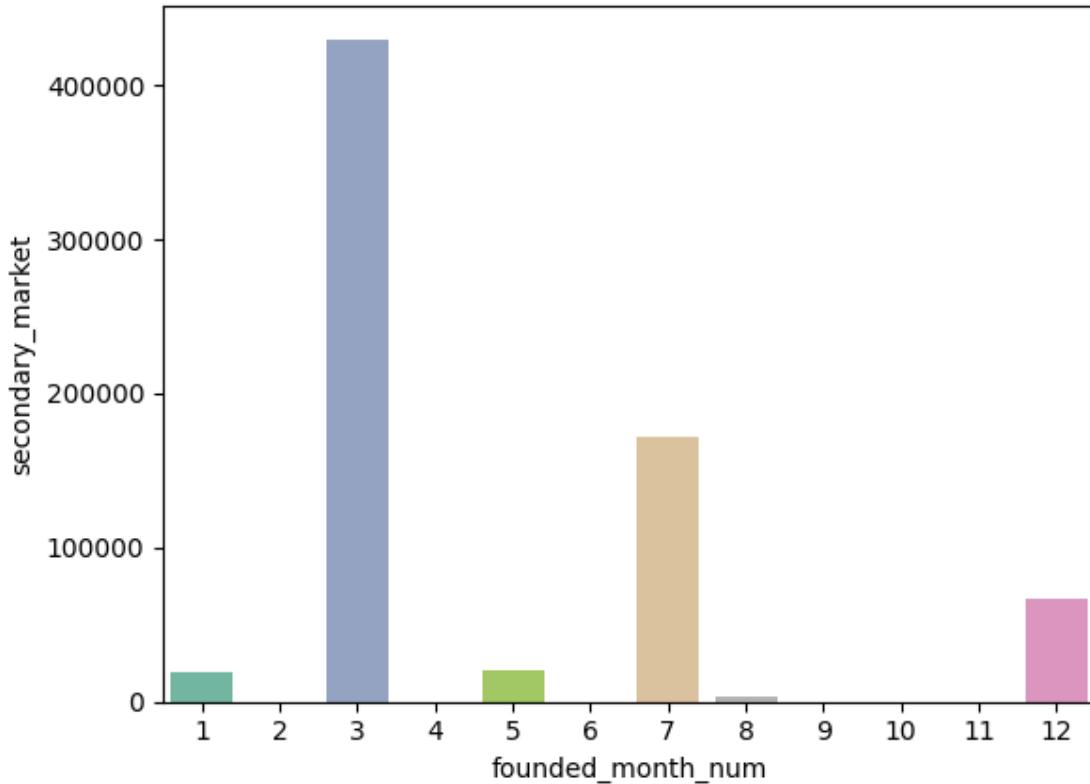
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'sum'}).
    ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='secondary_market'>
```



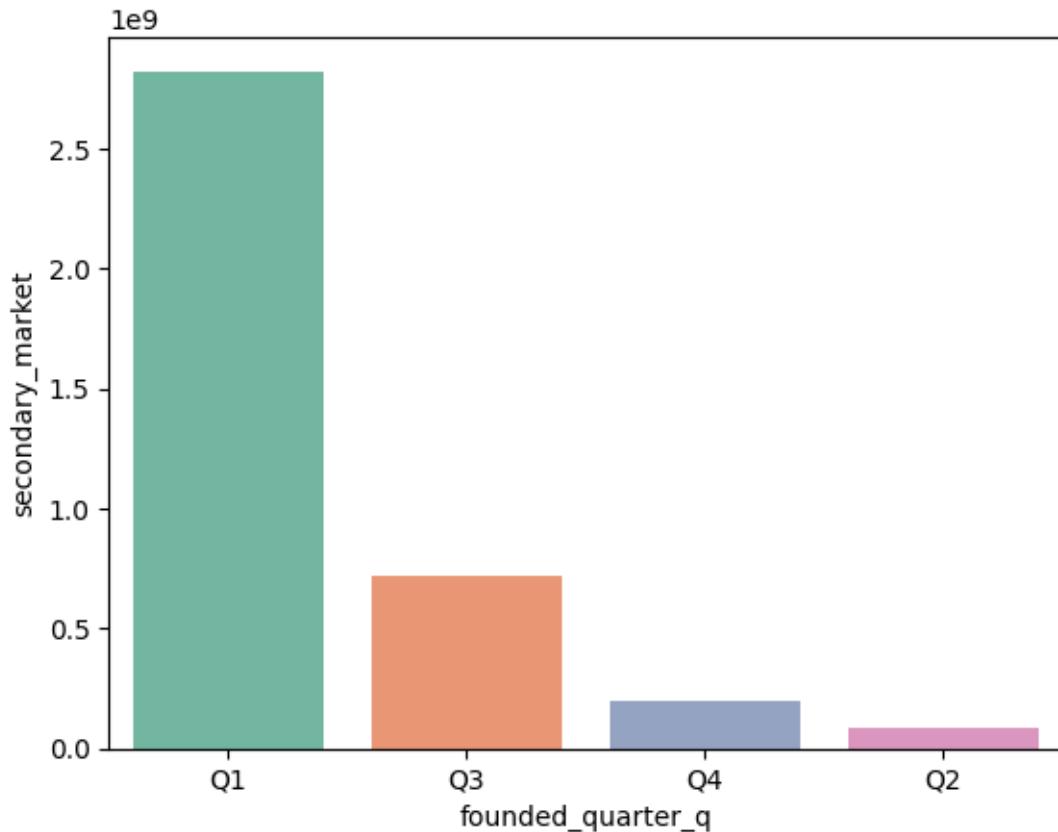
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='secondary_market'>
```



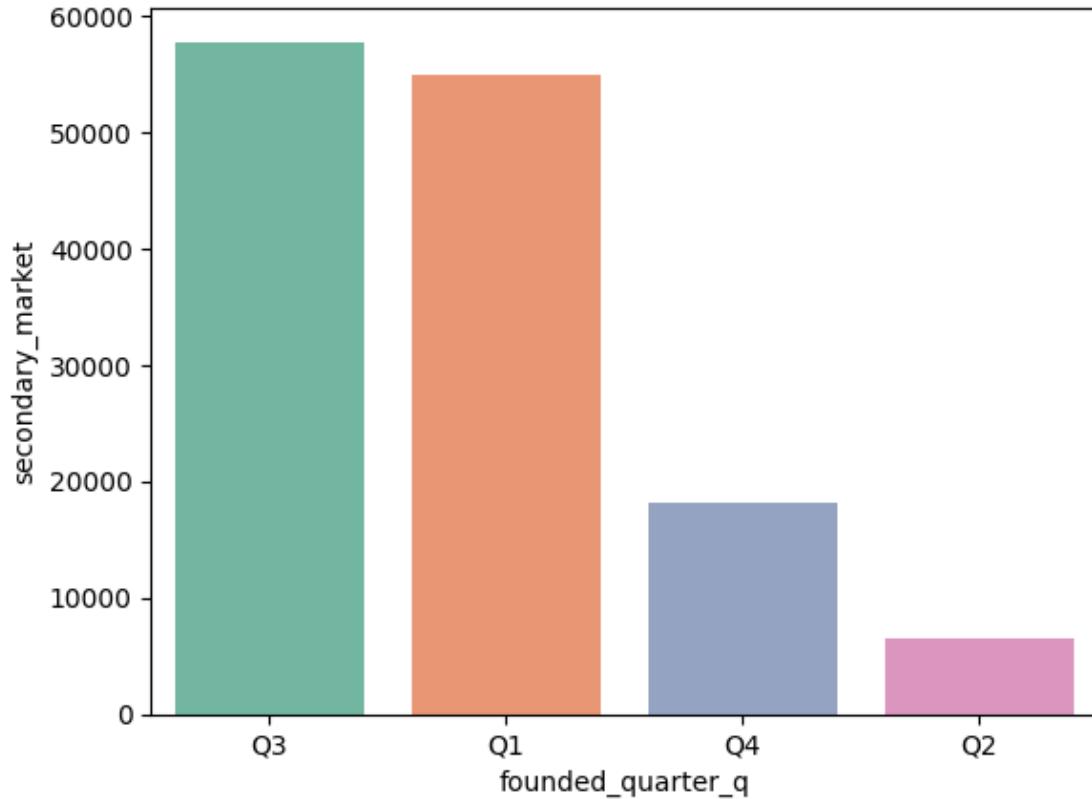
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'sum'}).
    ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q']!='Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'],palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='secondary_market'>
```



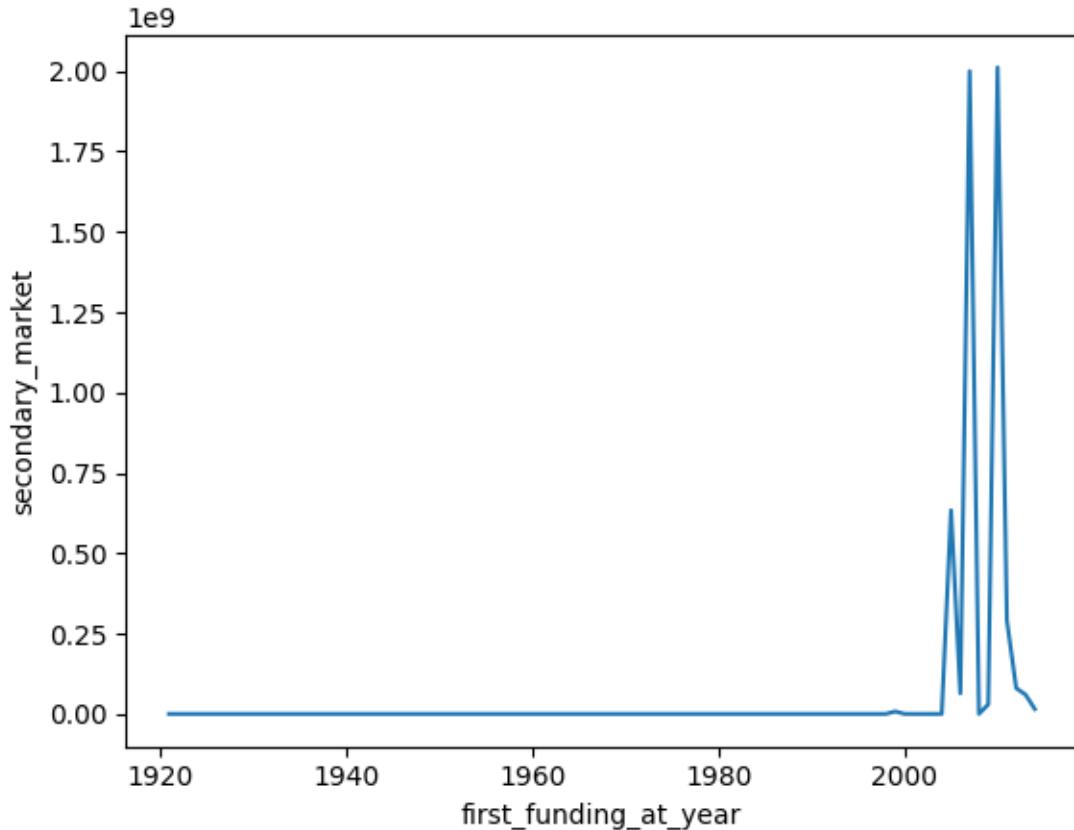
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'mean'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']  
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='secondary_market'>
```



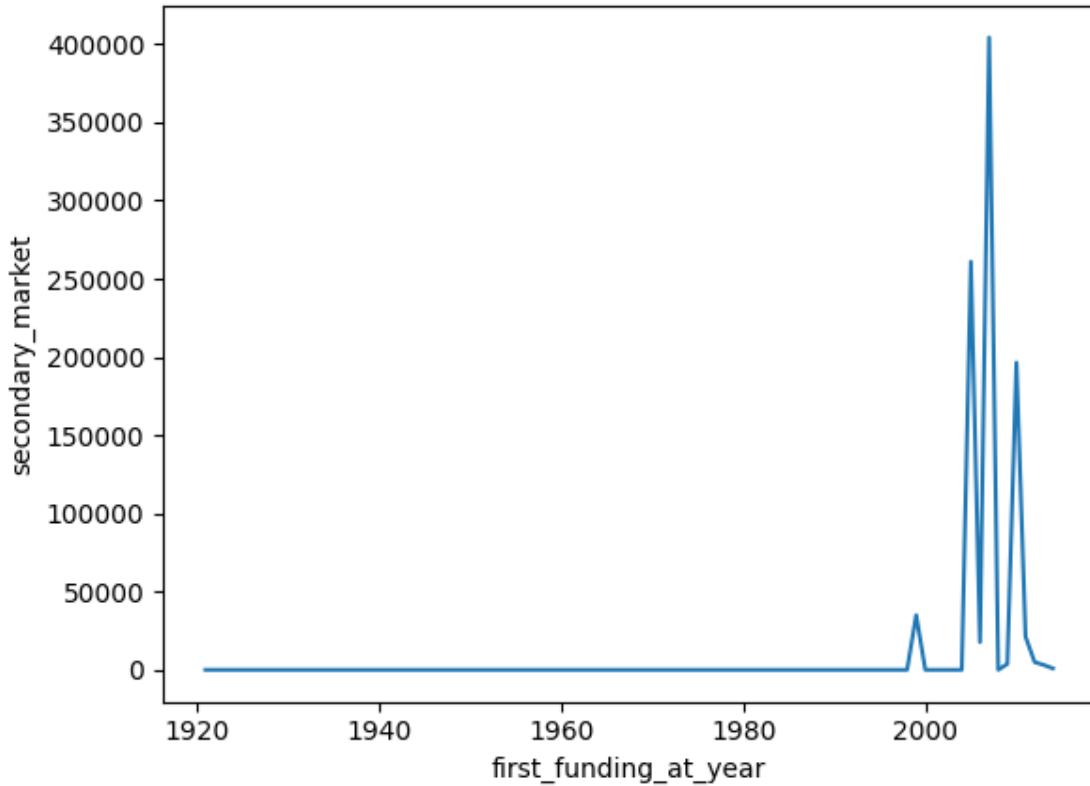
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='secondary_market'>
```



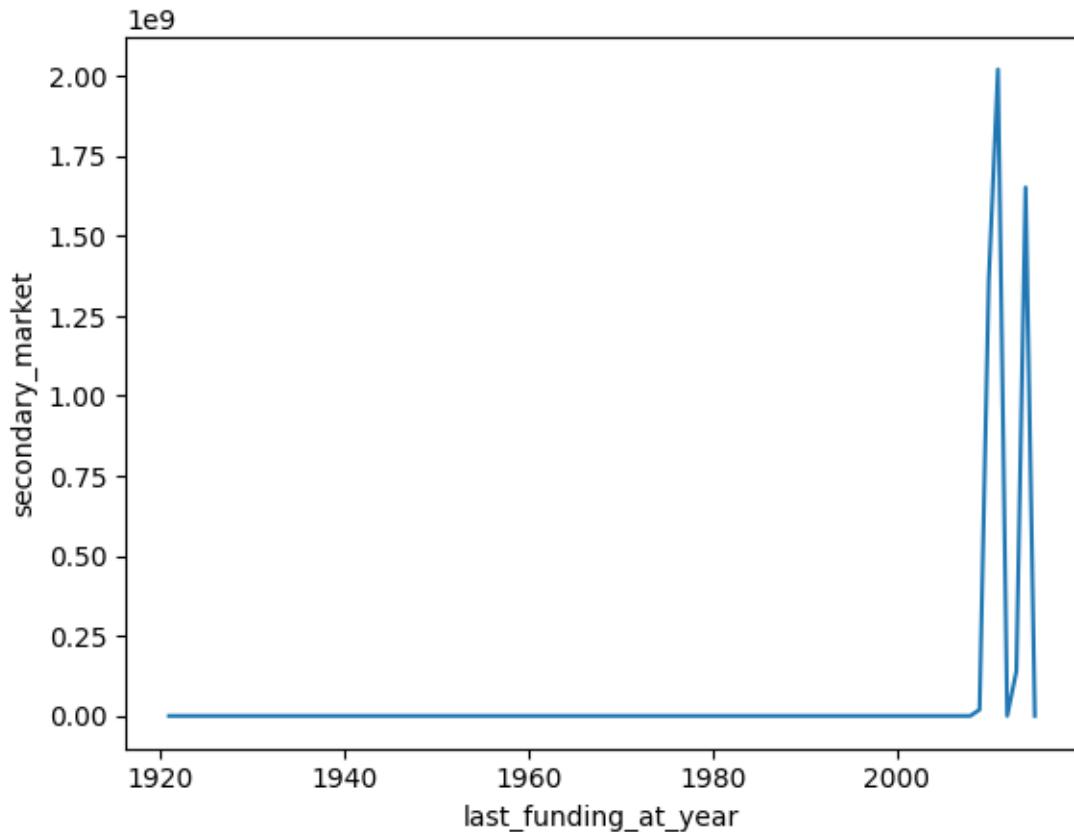
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='secondary_market'>
```



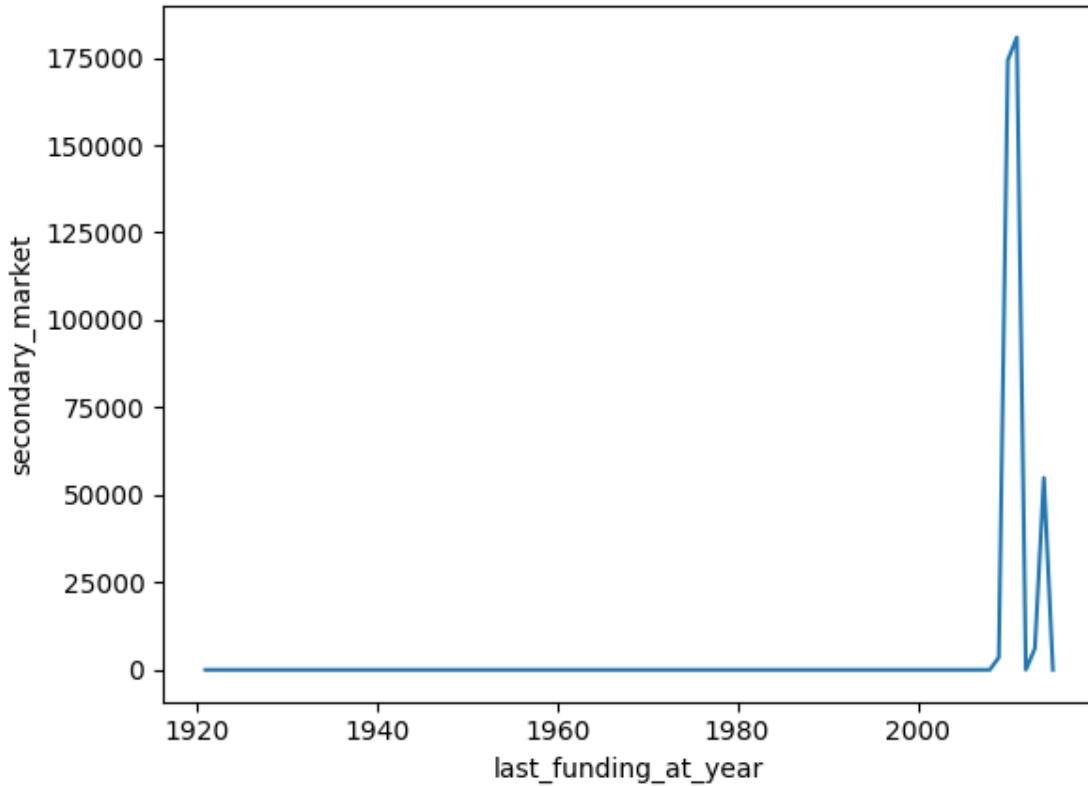
```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='secondary_market'>
```



```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'mean'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='secondary_market'>
```



## 1.17 Product Crowdfunding

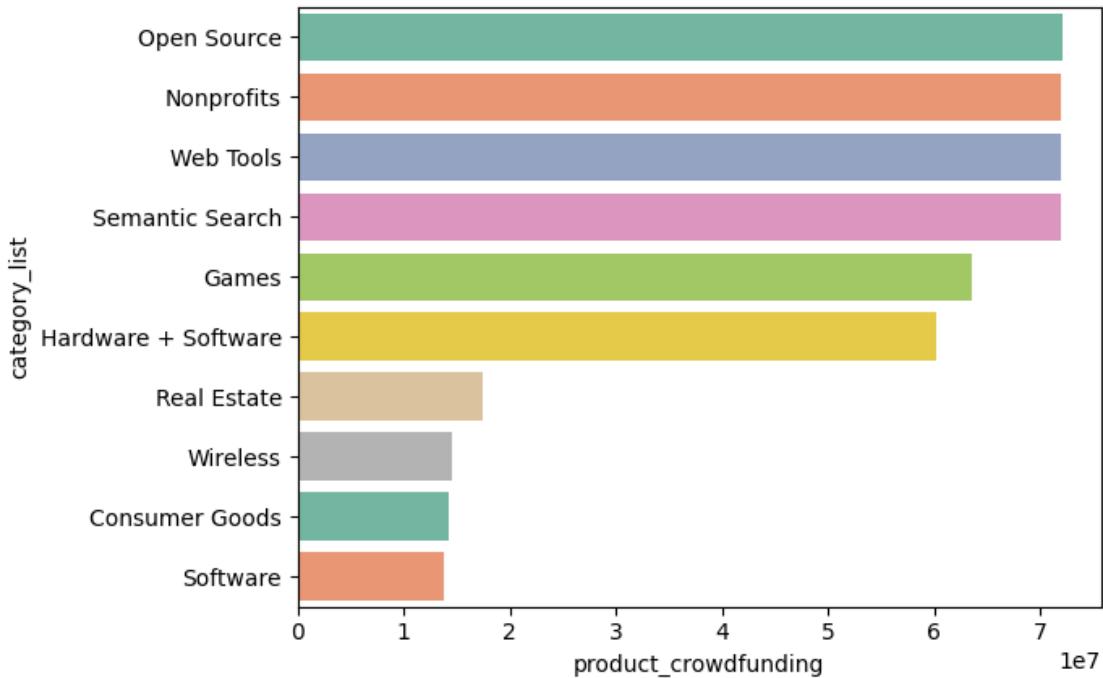
1. Product crowdfunding is a way to raise money from many people to fund the development, manufacturing, and distribution of a product.
2. It's a way for entrepreneurs to access alternative funding sources and build a community around their product

Average and Total Analysis of the Product CrowdFunded Funds as shown below.

```
[ ]: column = 'product_crowdfunding'

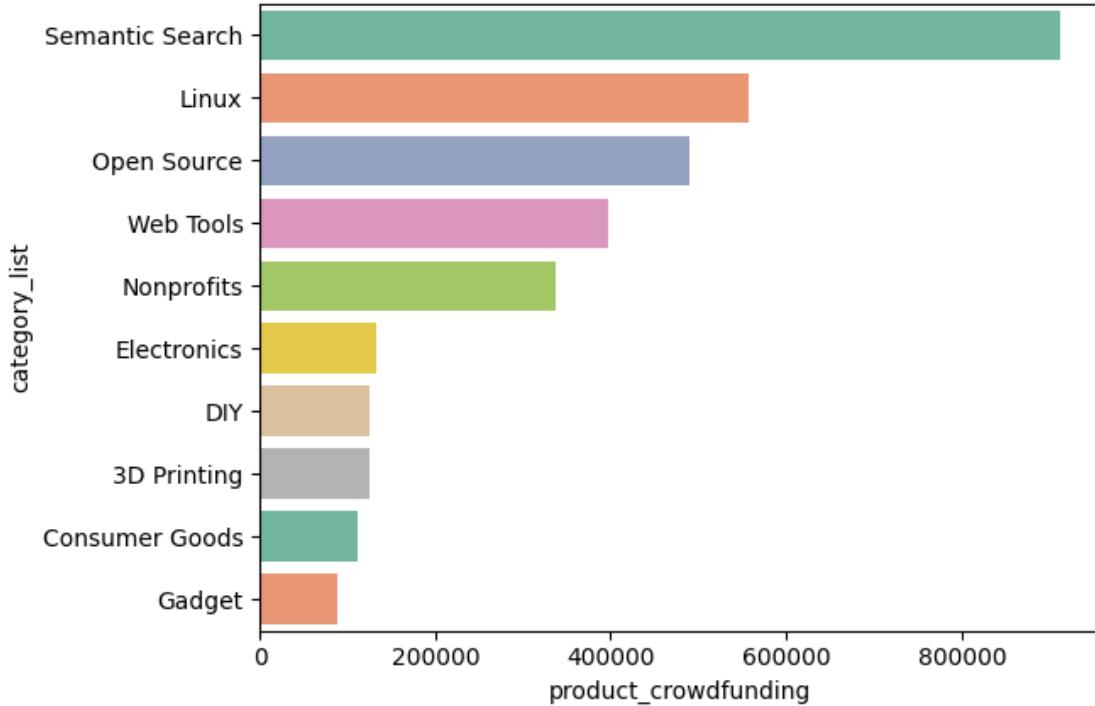
[ ]: df_plot = df_clean.groupby('category_list').agg({column: 'sum'}).reset_index()
     .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')

[ ]: <Axes: xlabel='product_crowdfunding', ylabel='category_list'>
```



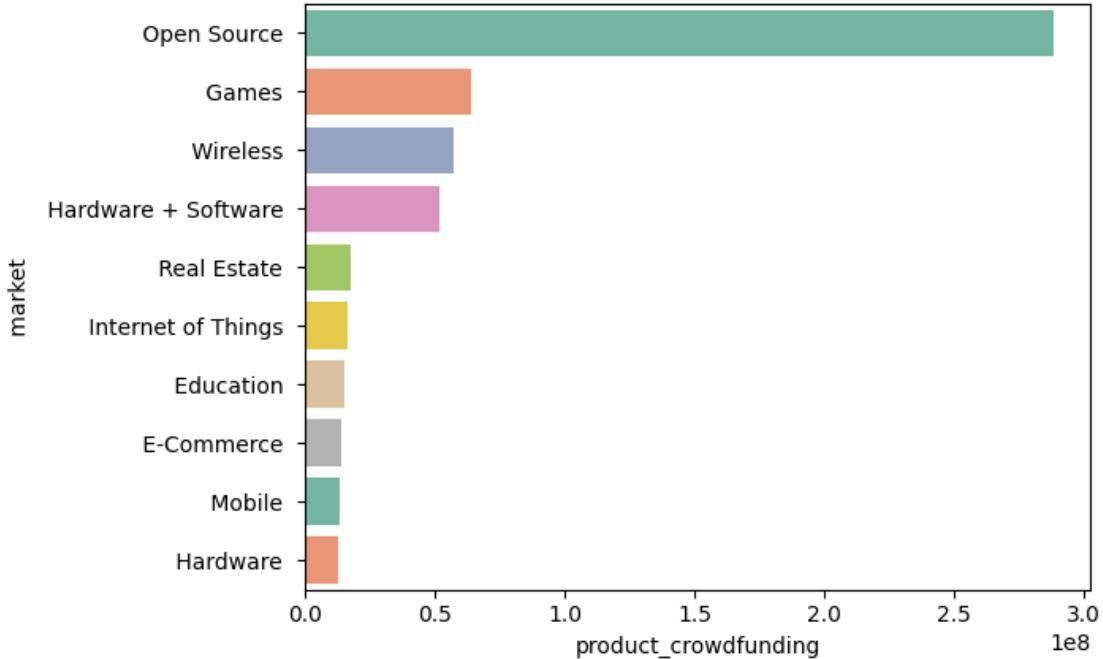
```
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')
```

```
[ ]: <Axes: xlabel='product_crowdfunding', ylabel='category_list'>
```



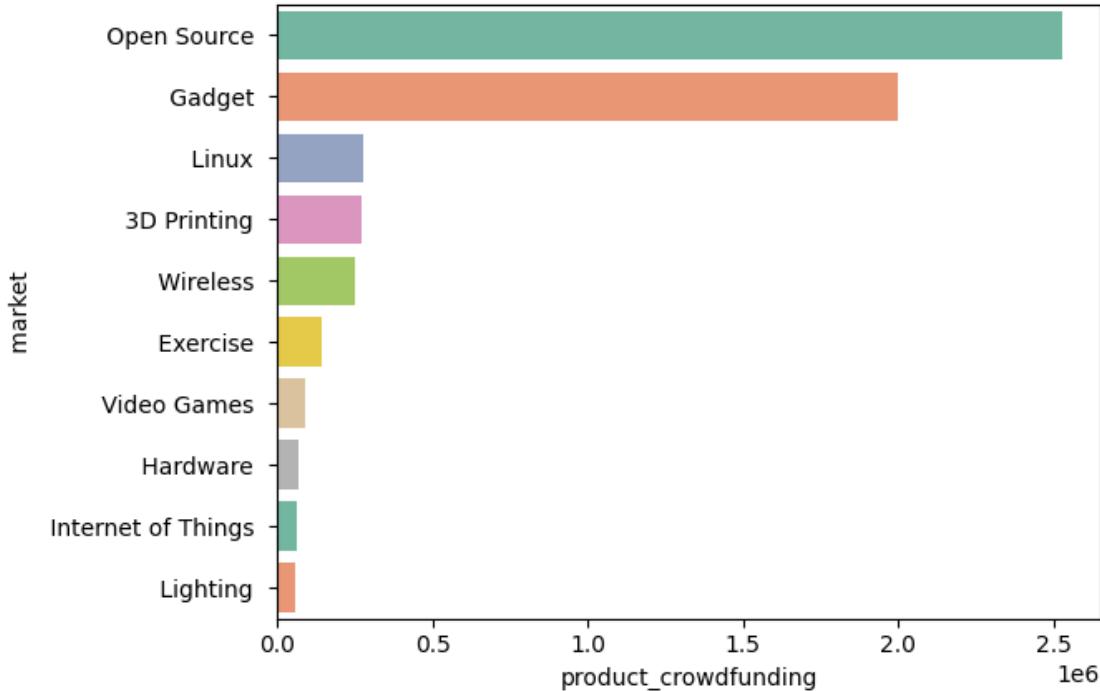
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'sum'}).reset_index().  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='product_crowdfunding', ylabel=' market '>
```



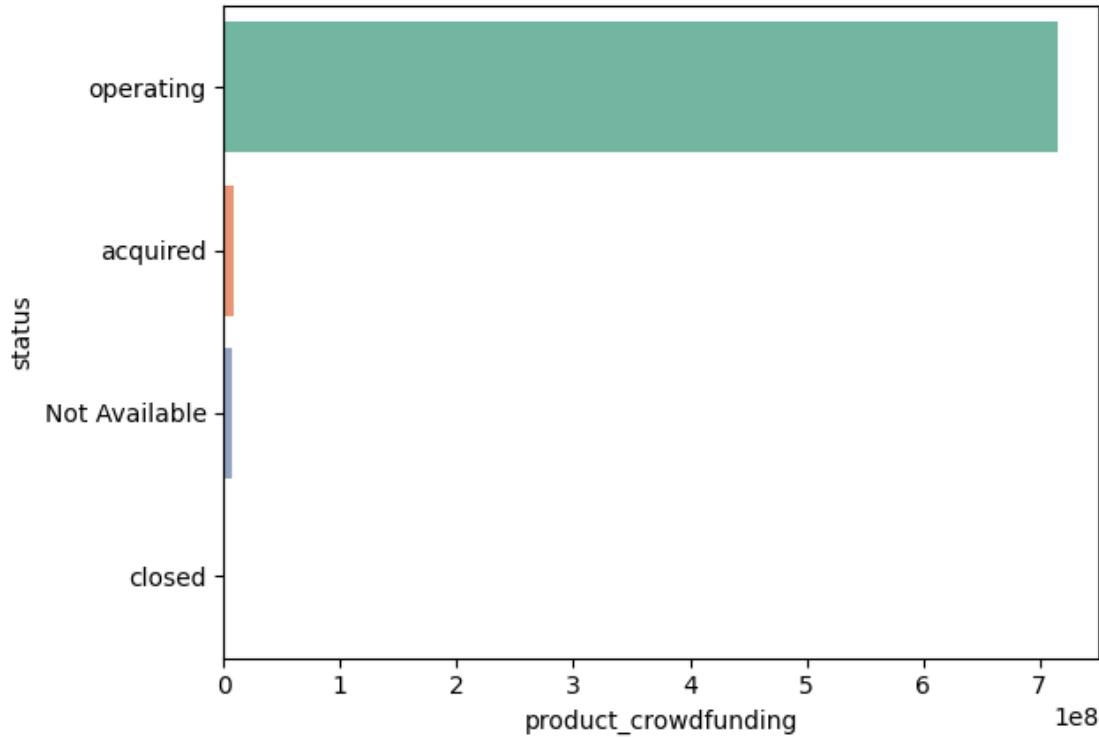
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '], palette='Set2')
```

```
[ ]: <Axes: xlabel='product_crowdfunding', ylabel=' market '>
```



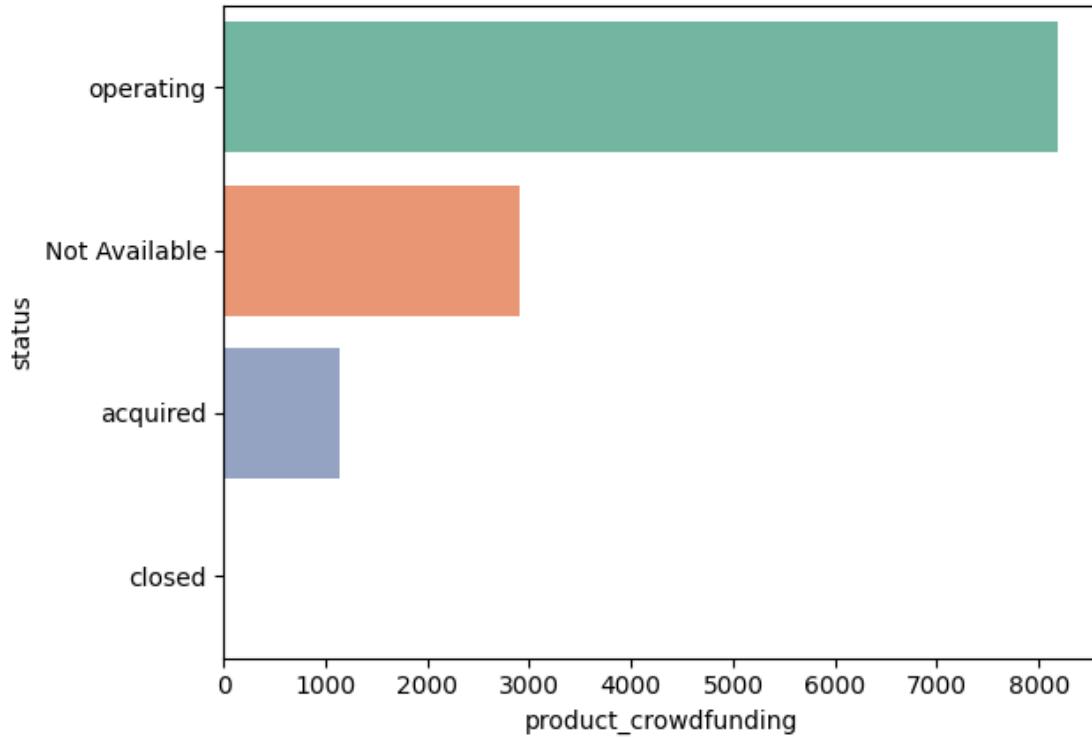
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='product_crowdfunding', ylabel='status'>
```



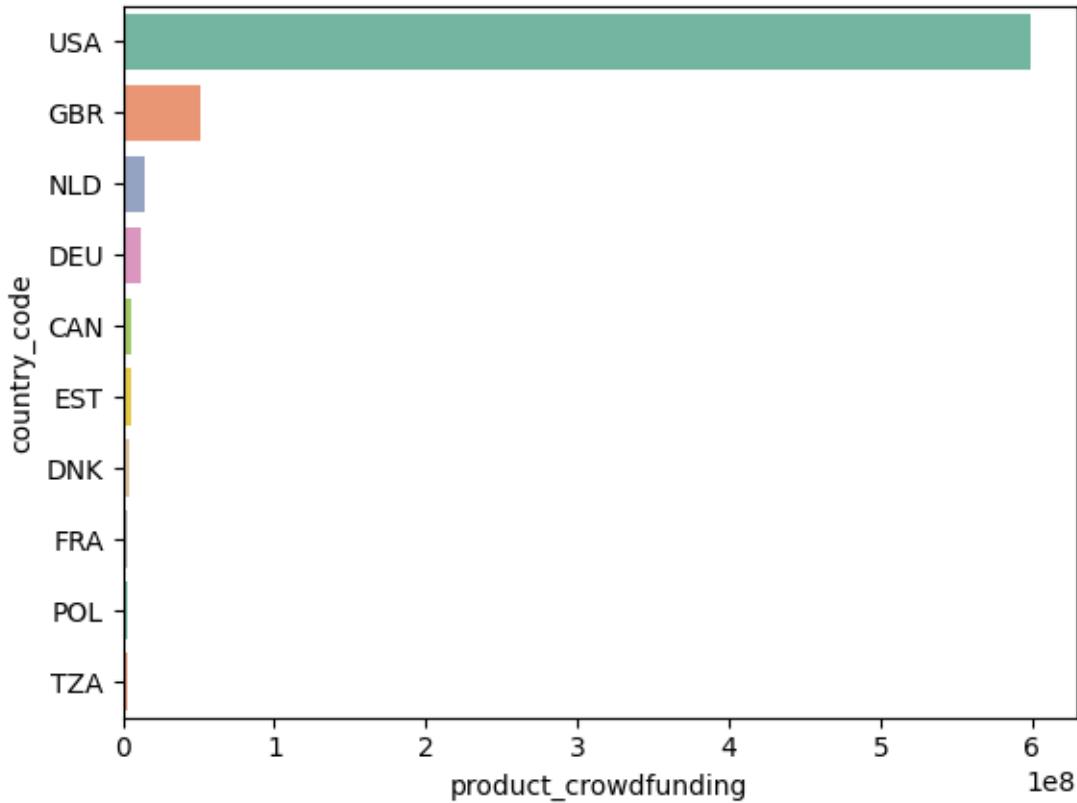
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'mean'}).reset_index()
    .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='product_crowdfunding', ylabel='status'>
```



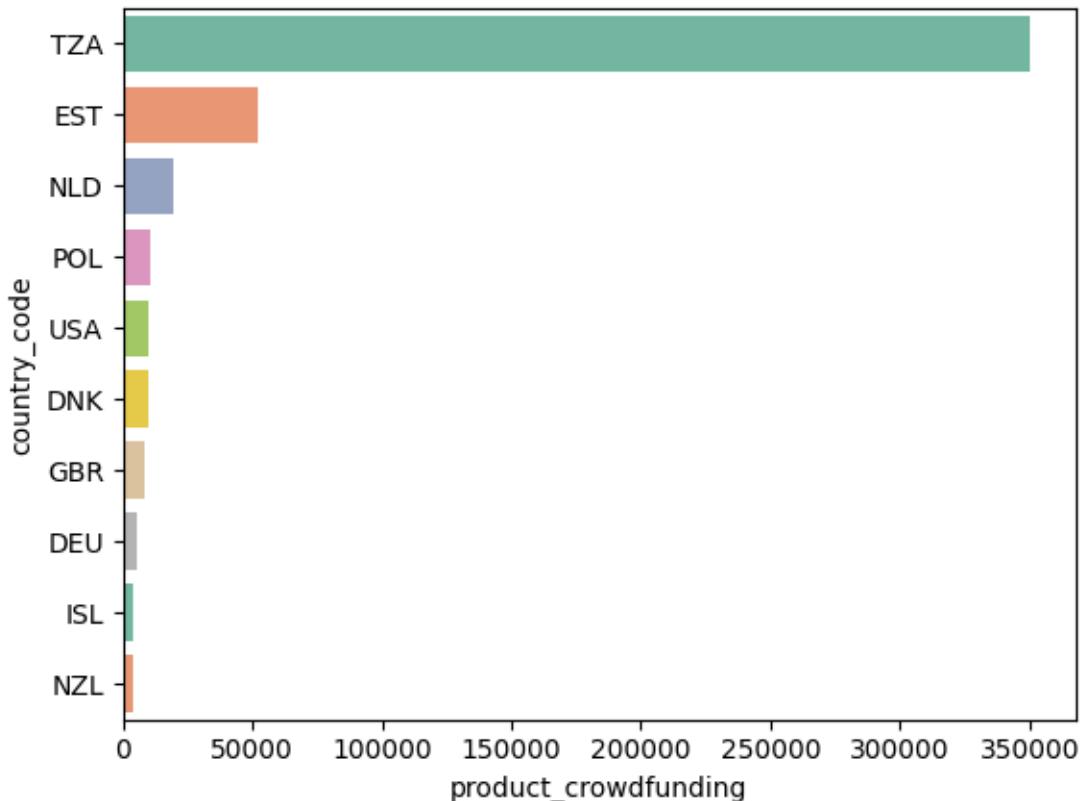
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column,ascending=False).head(11)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='product_crowdfunding', ylabel='country_code'>
```



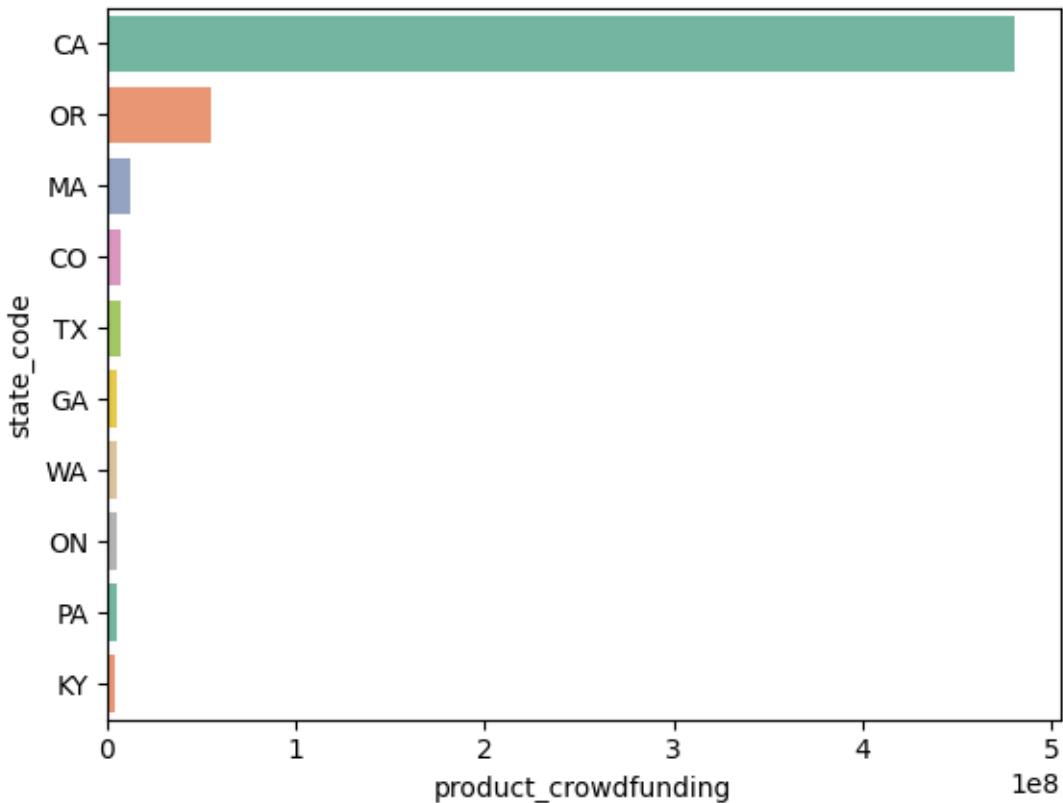
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='product_crowdfunding', ylabel='country_code'>
```



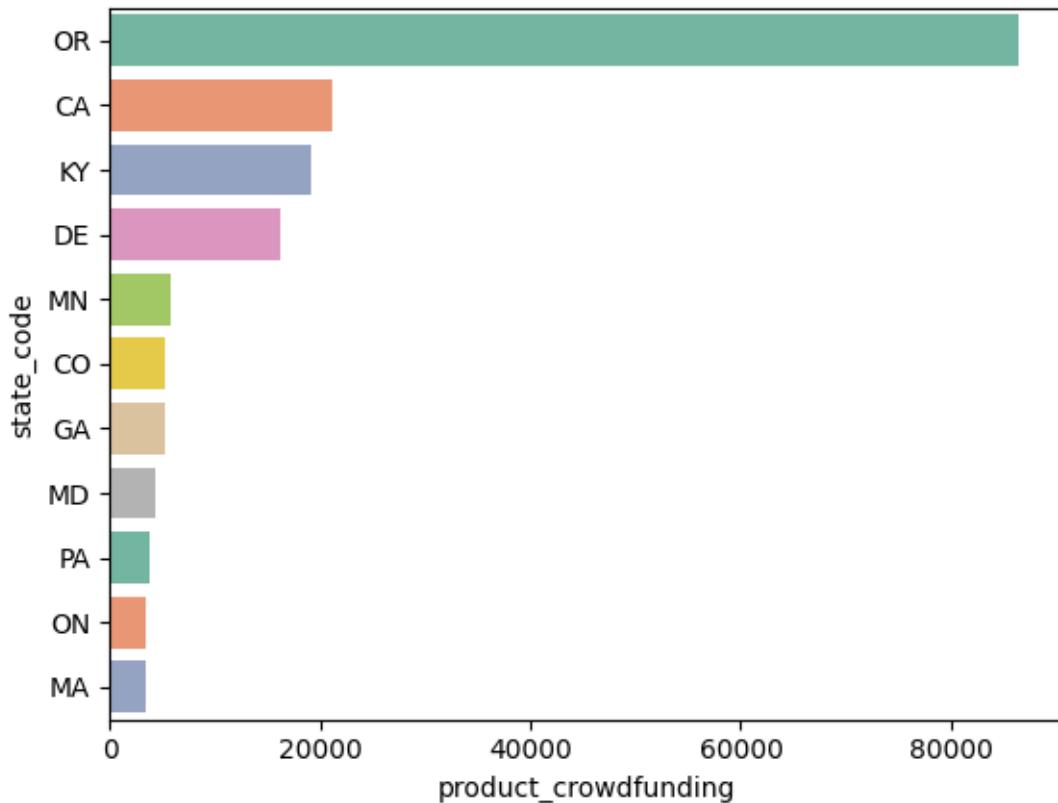
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='product_crowdfunding', ylabel='state_code'>
```



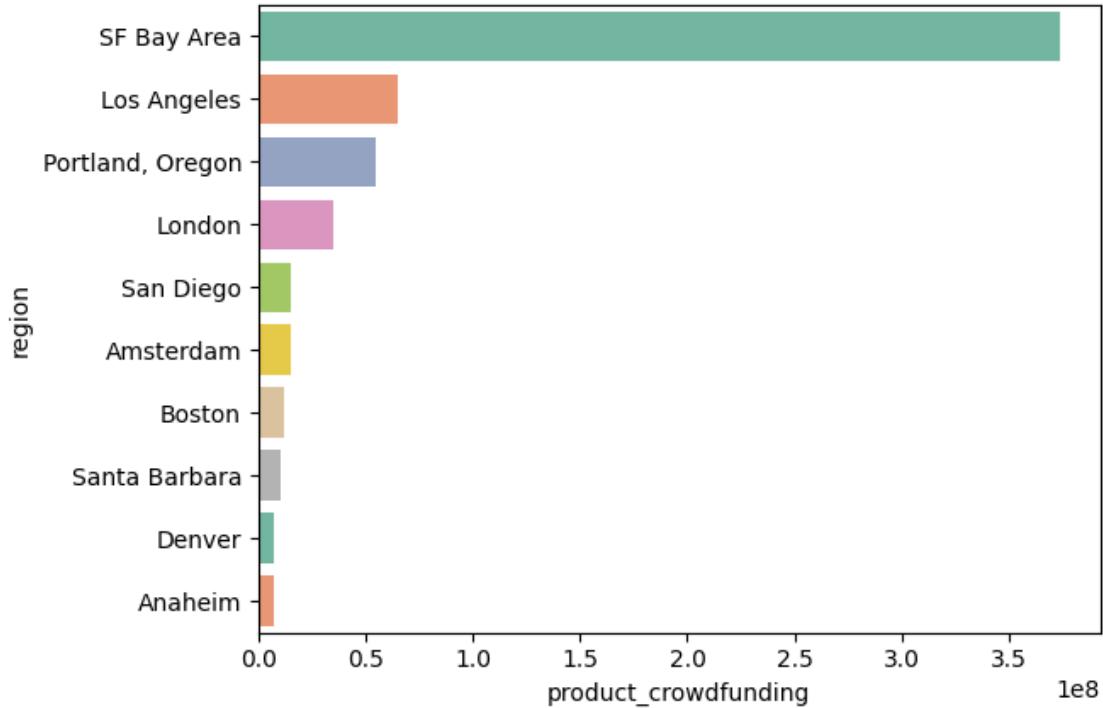
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'mean'}).reset_index().  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='product_crowdfunding', ylabel='state_code'>
```



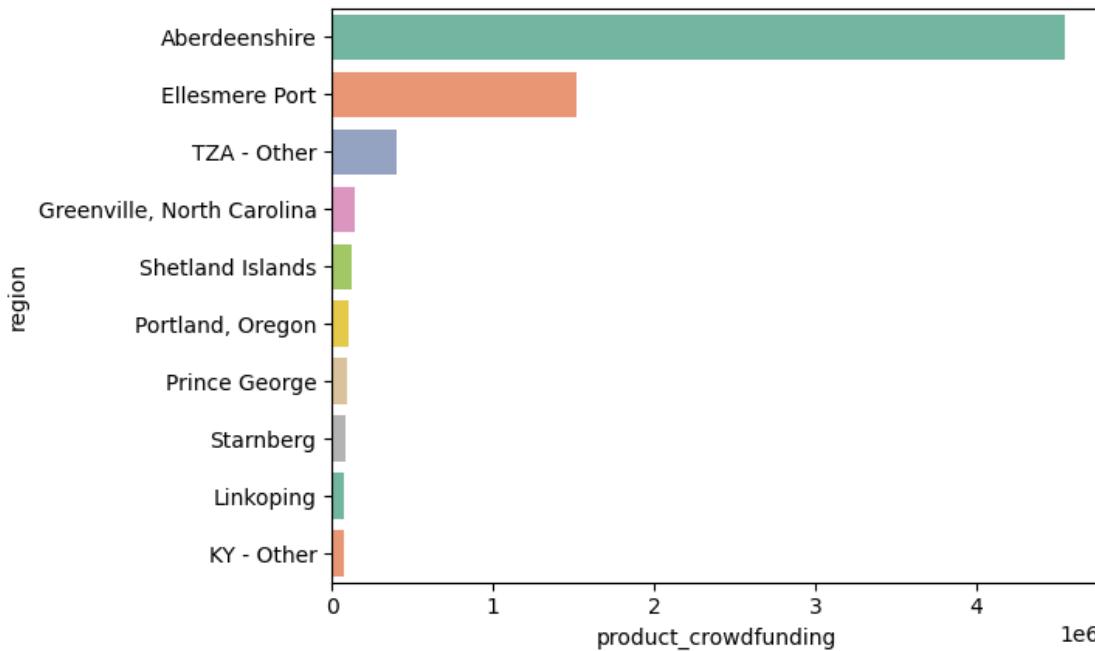
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='product_crowdfunding', ylabel='region'>
```



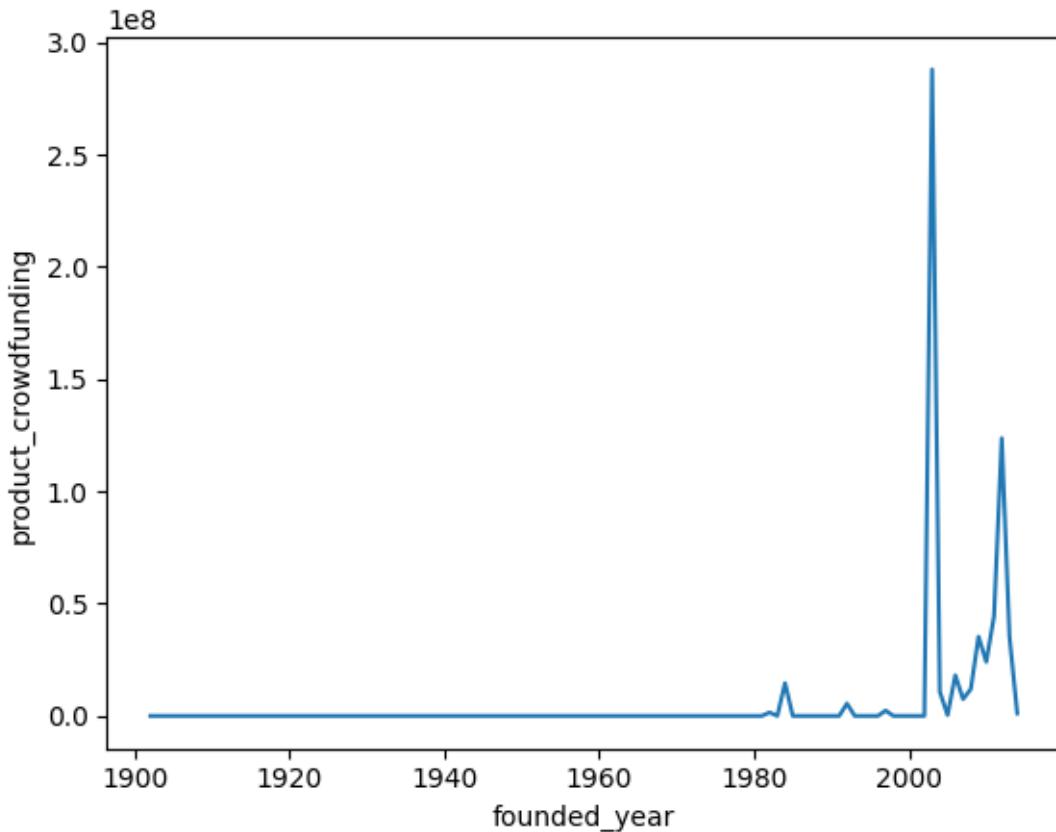
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'mean'}).reset_index()
      ↪sort_values(column, ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='product_crowdfunding', ylabel='region'>
```



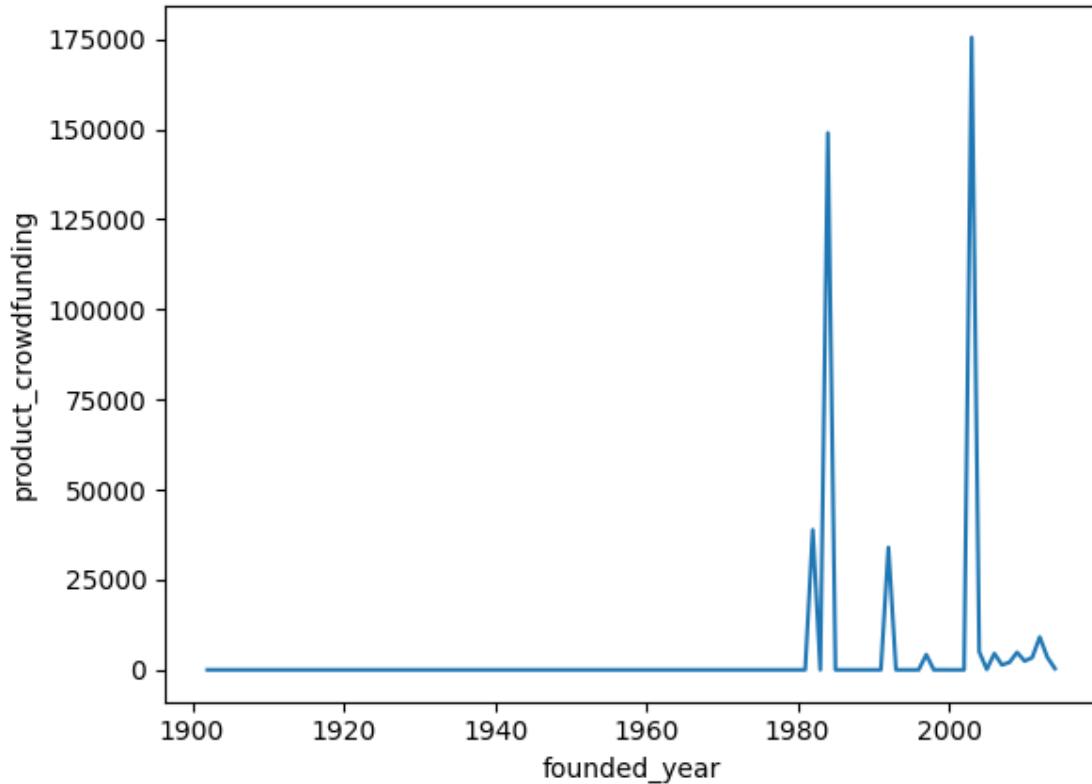
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='product_crowdfunding'>
```



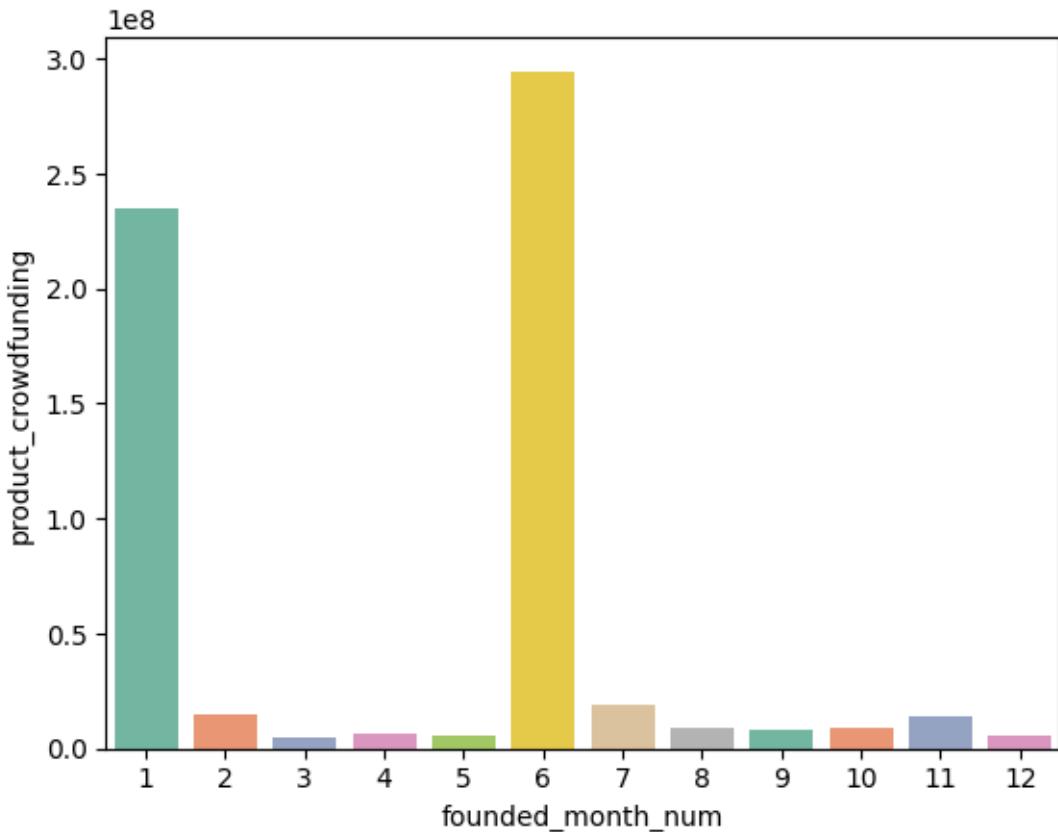
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'mean'}).reset_index().  
      ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='product_crowdfunding'>
```



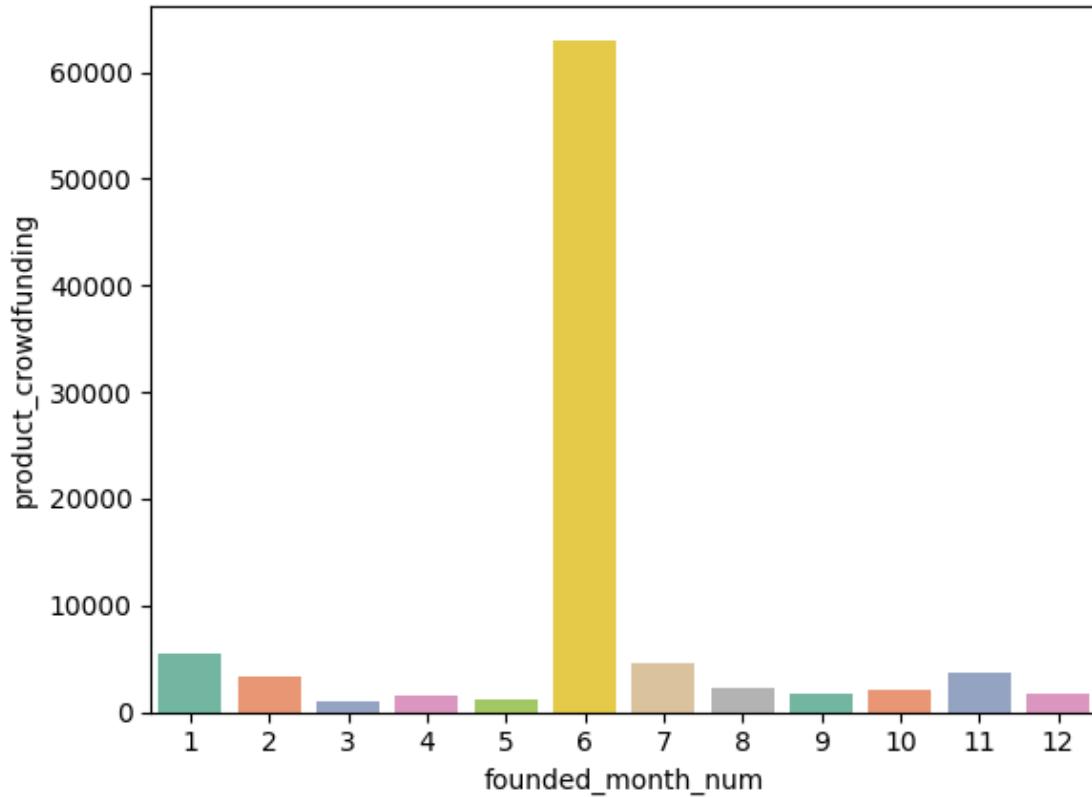
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'sum'}).
    ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='product_crowdfunding'>
```



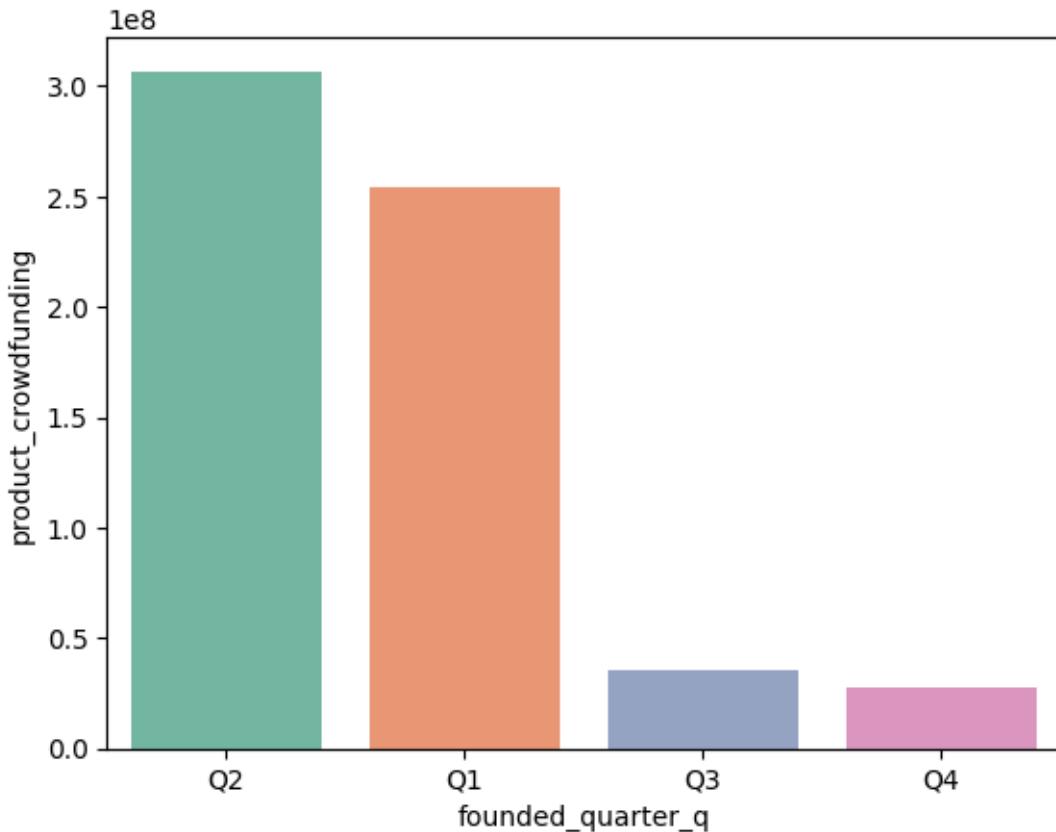
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='product_crowdfunding'>
```



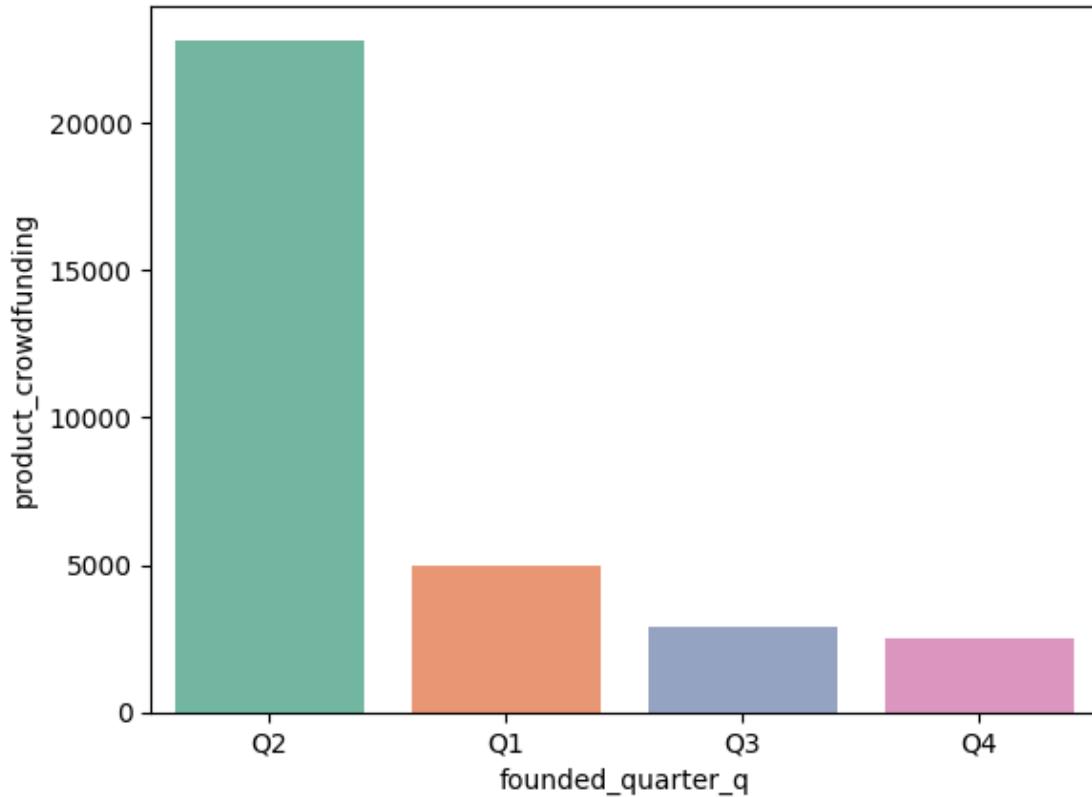
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'sum'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q']!= 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='product_crowdfunding'>
```



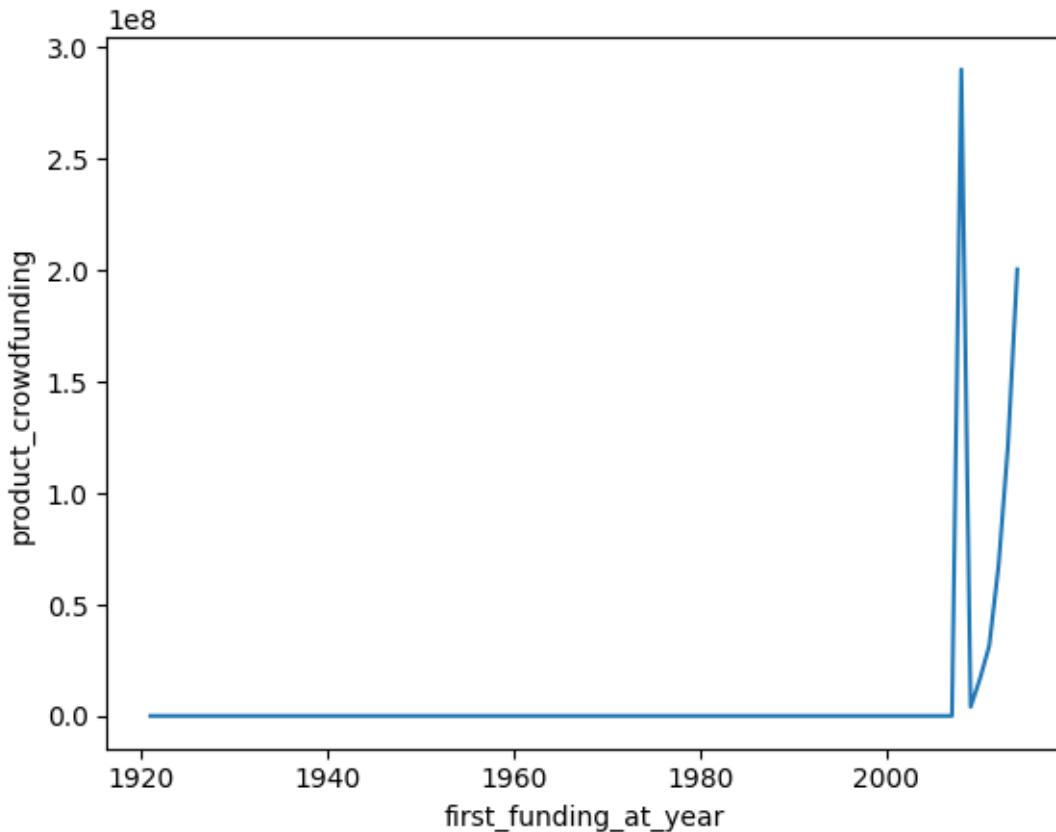
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'mean'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']  
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='product_crowdfunding'>
```



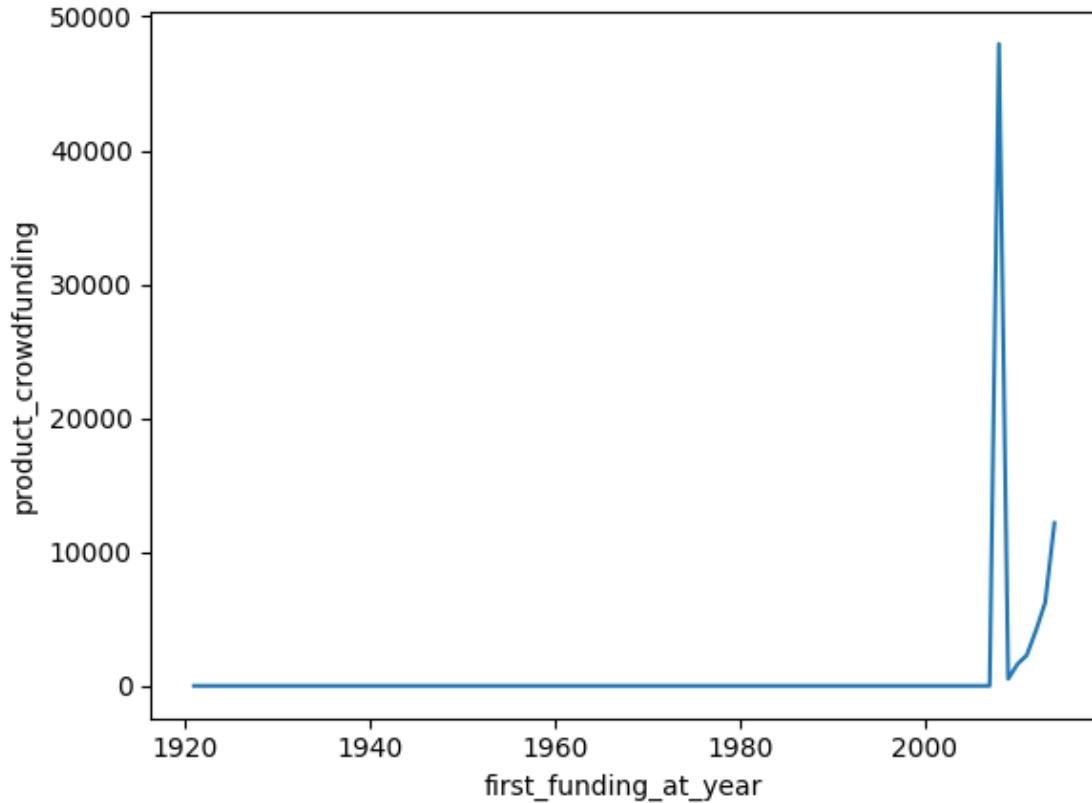
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='product_crowdfunding'>
```



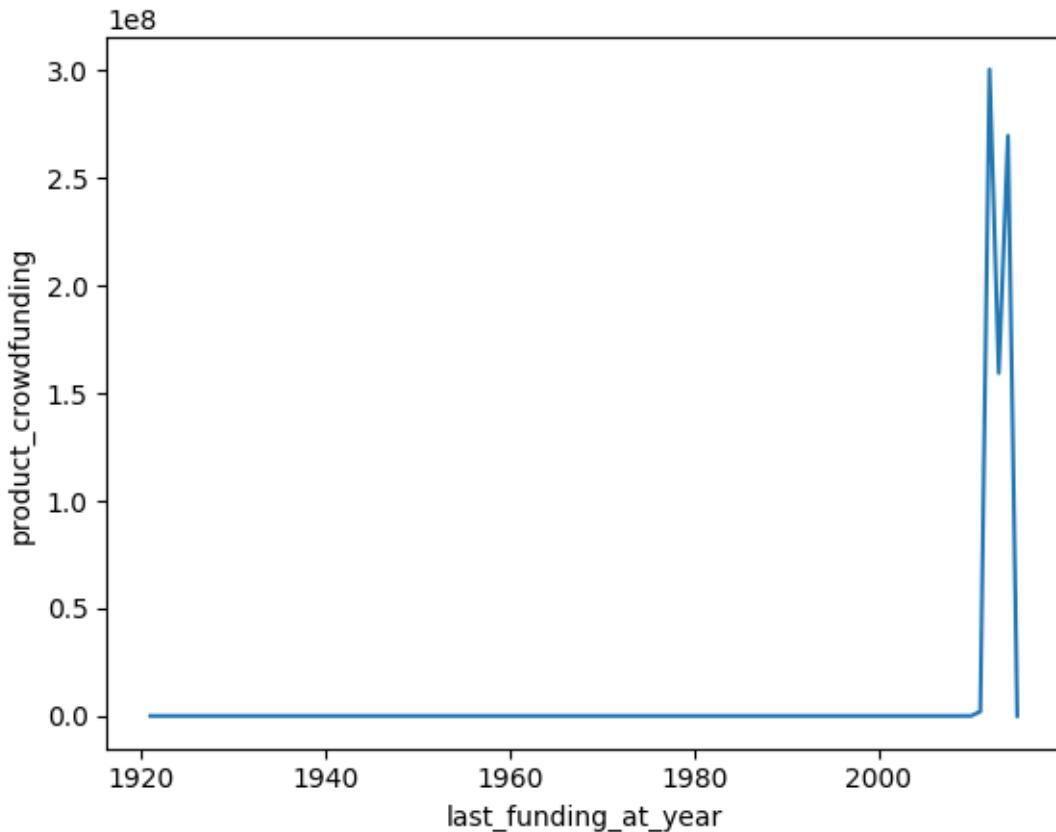
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'mean'}).
      ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='product_crowdfunding'>
```



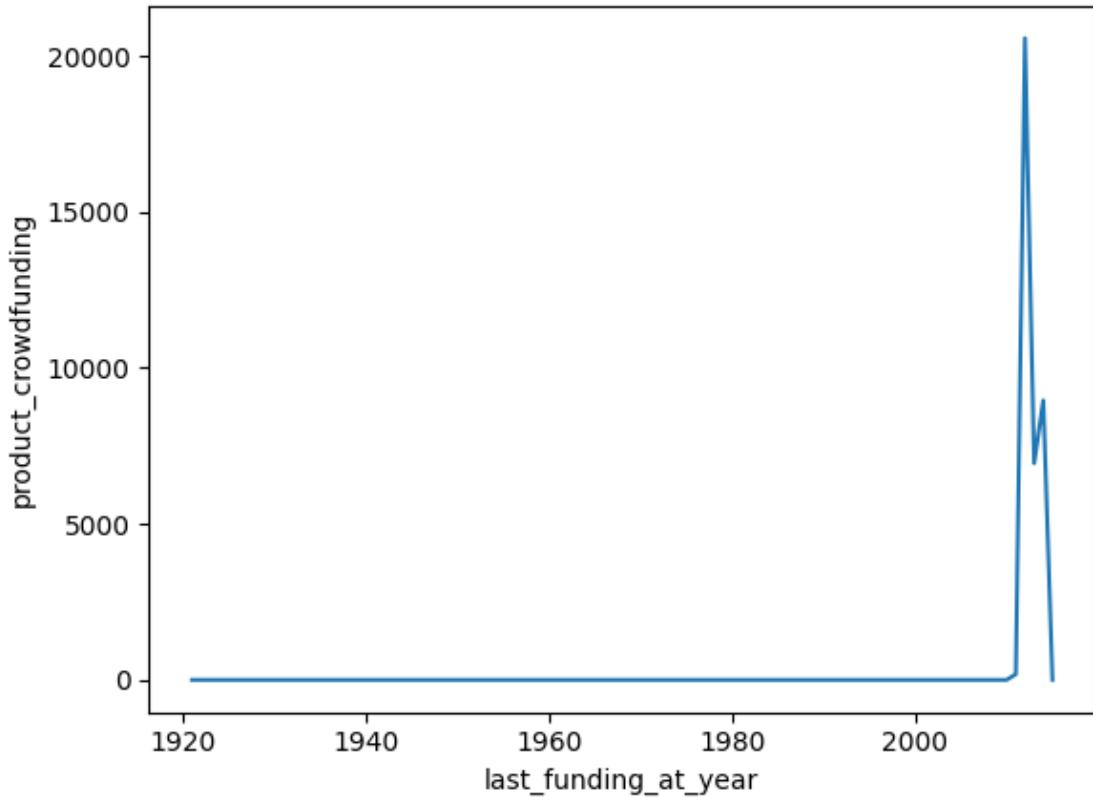
```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='product_crowdfunding'>
```



```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column,ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='product_crowdfunding'>
```



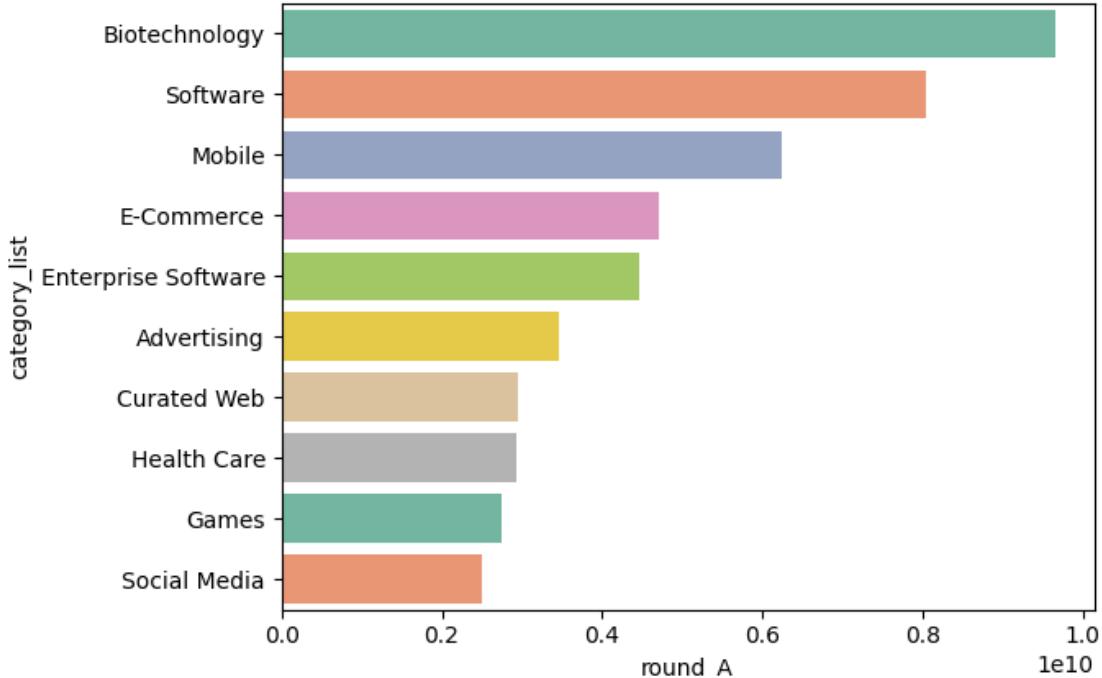
## 1.18 Round\_A

Average and Total Analysis of the Round A Funds as shown below.

```
[ ]: column = 'round_A'

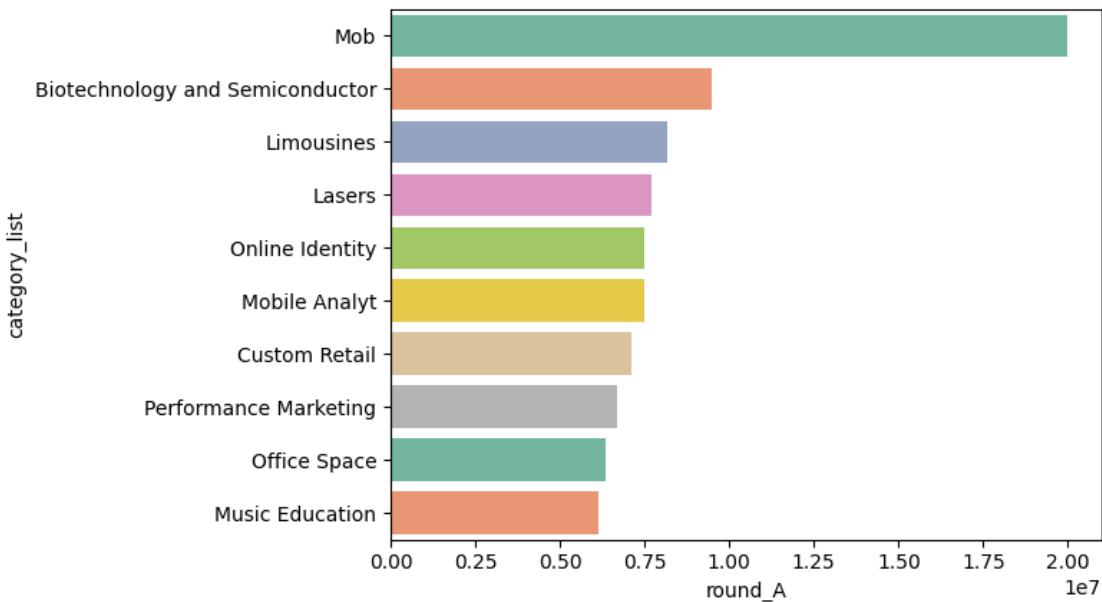
[ ]: df_plot = df_clean.groupby('category_list').agg({column: 'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')

[ ]: <Axes: xlabel='round_A', ylabel='category_list'>
```



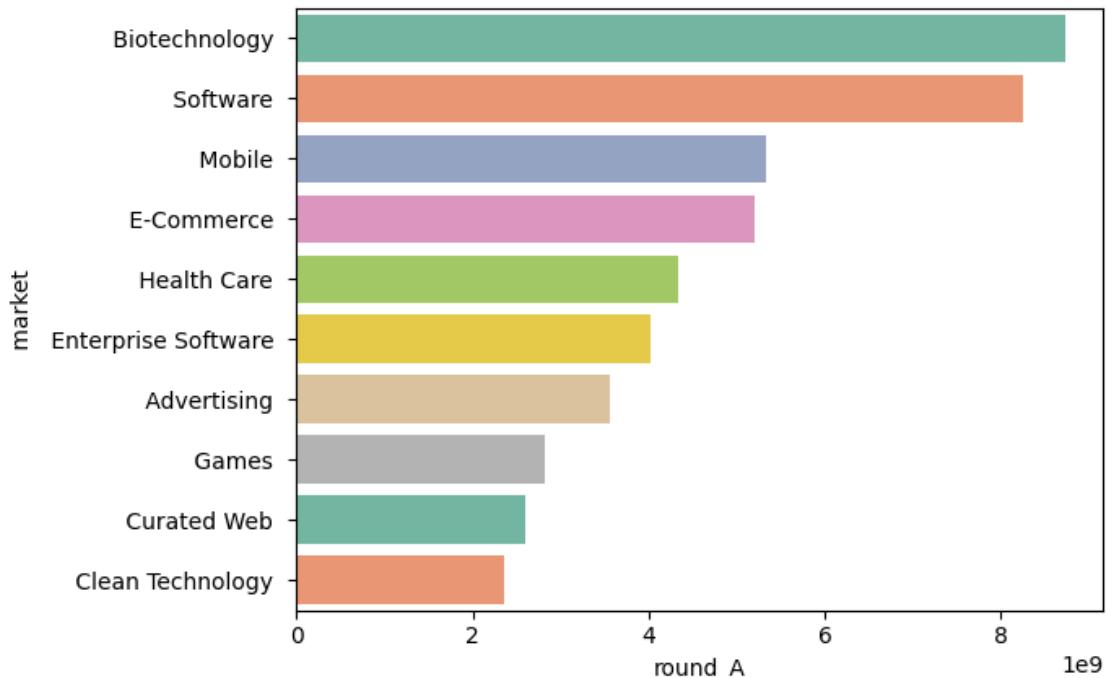
```
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'mean'}).reset_index()
      ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_A', ylabel='category_list'>
```



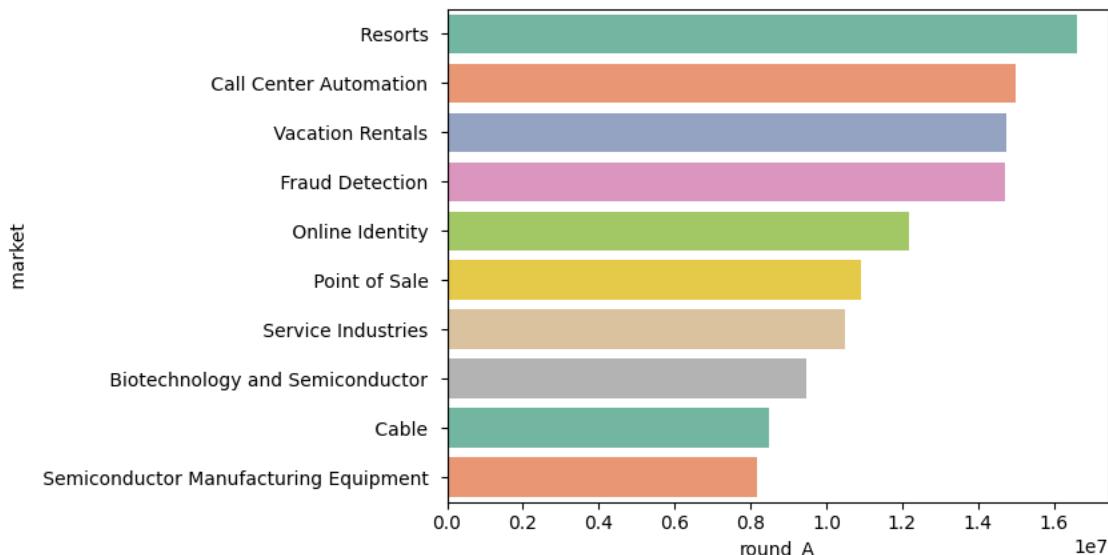
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'sum'}).reset_index().sort_values(column,ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='round_A', ylabel=' market '>
```



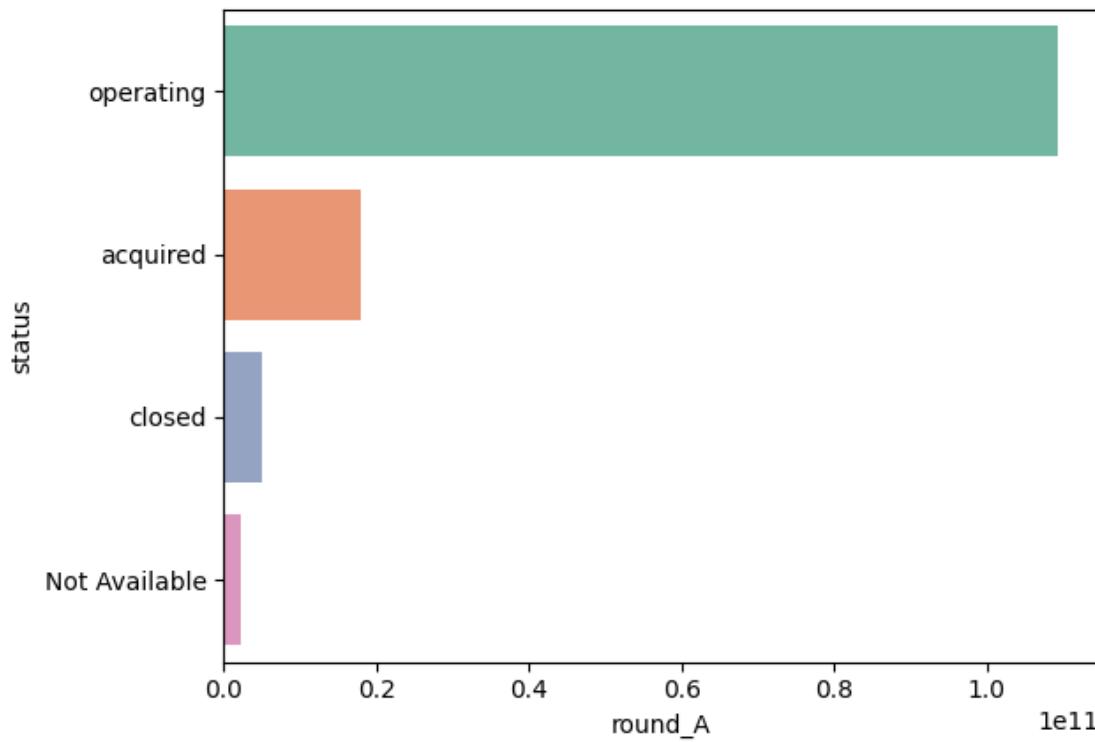
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'mean'}).reset_index().sort_values(column,ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='round_A', ylabel=' market '>
```



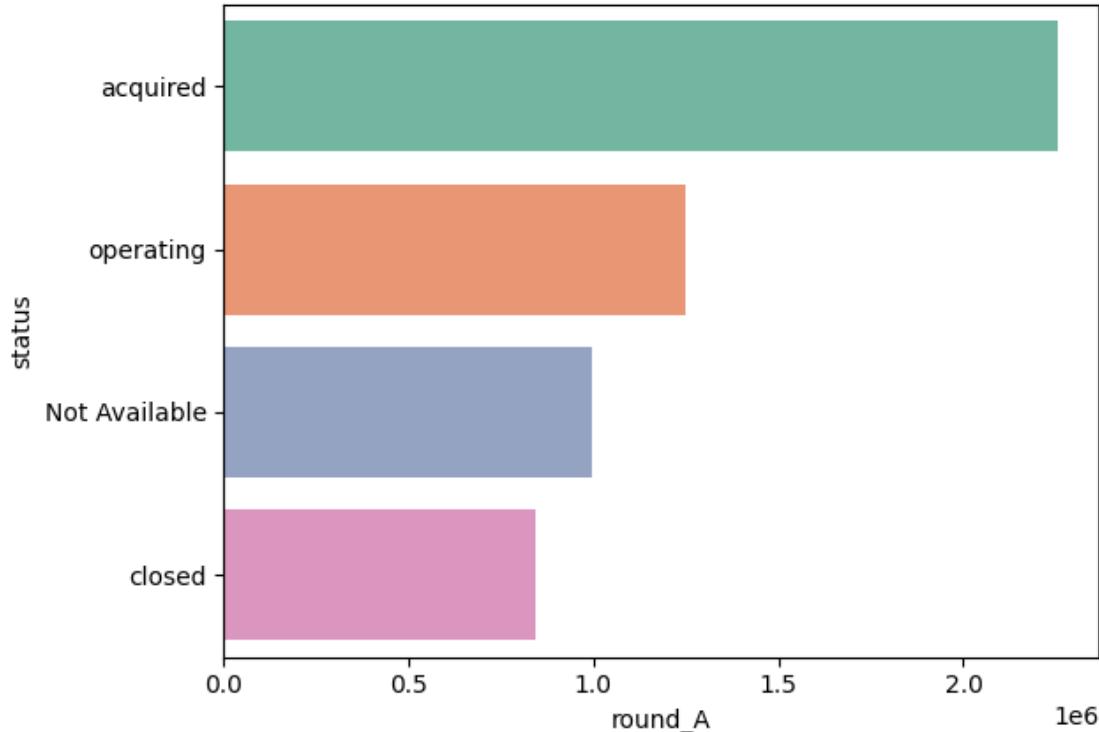
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'sum'}).reset_index()
      ↪sort_values(column,ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'],palette='Set2')
```

```
[ ]: <Axes: xlabel='round_A', ylabel='status'>
```



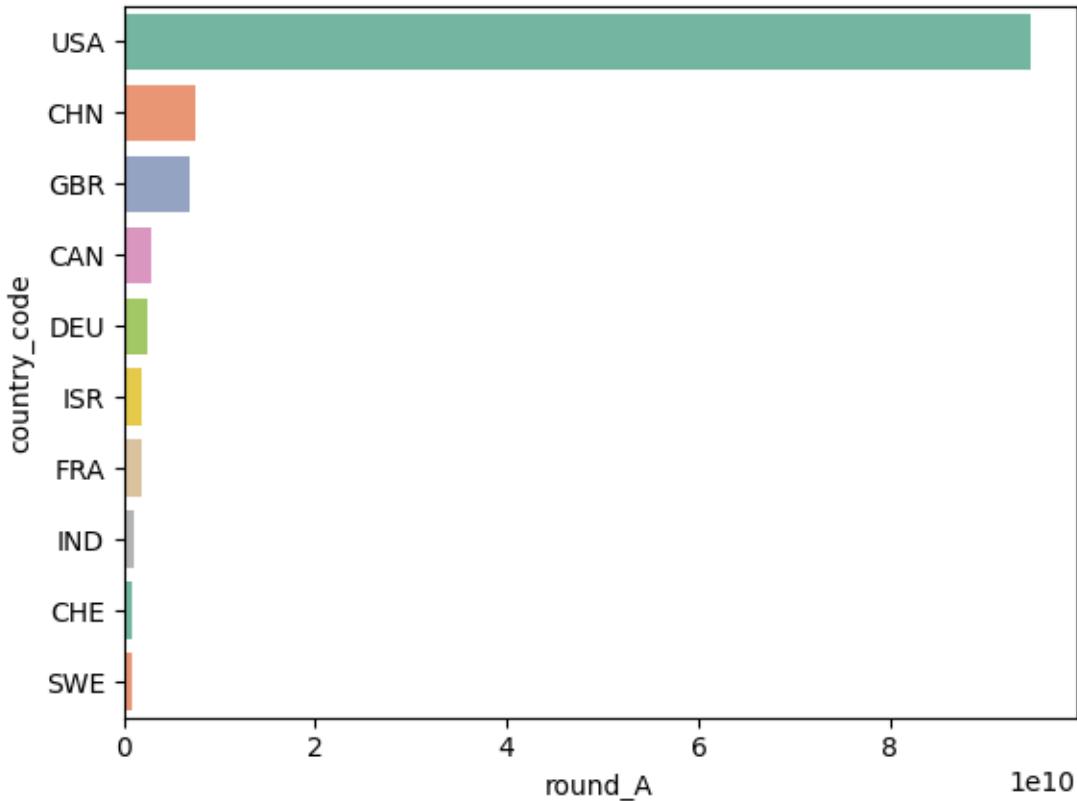
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'mean'}).reset_index()
      ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_A', ylabel='status'>
```



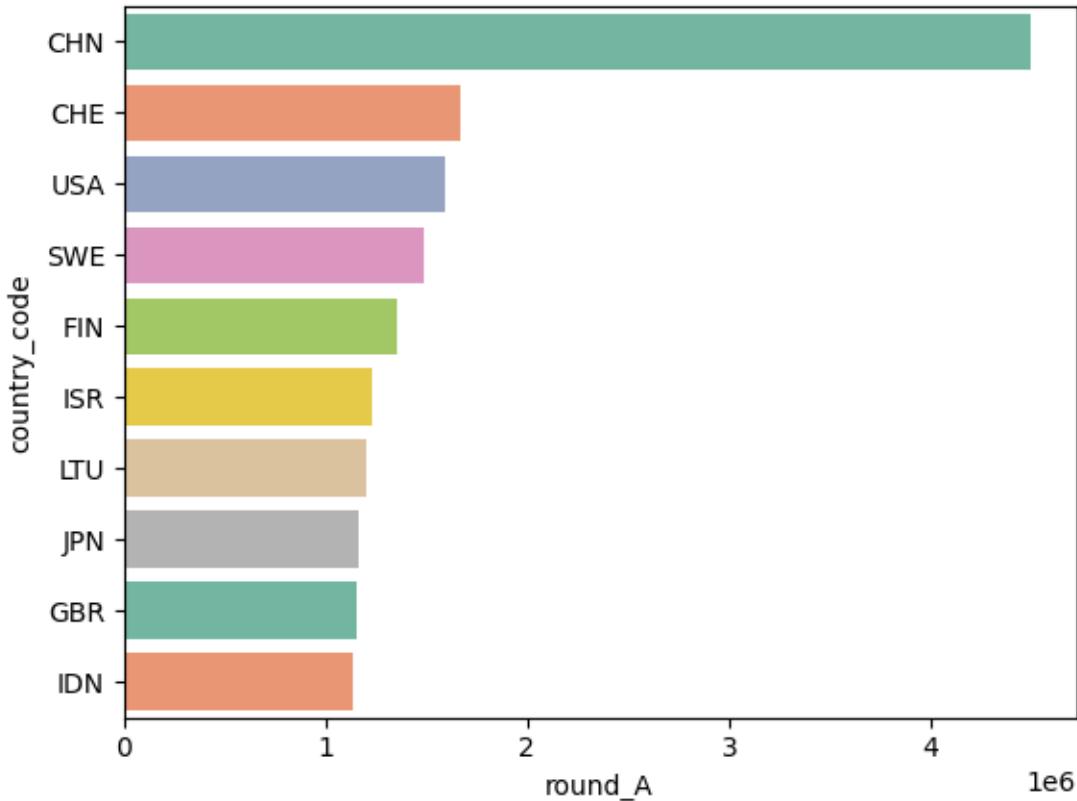
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'sum'}).reset_index()
      ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['country_code']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_A', ylabel='country_code'>
```



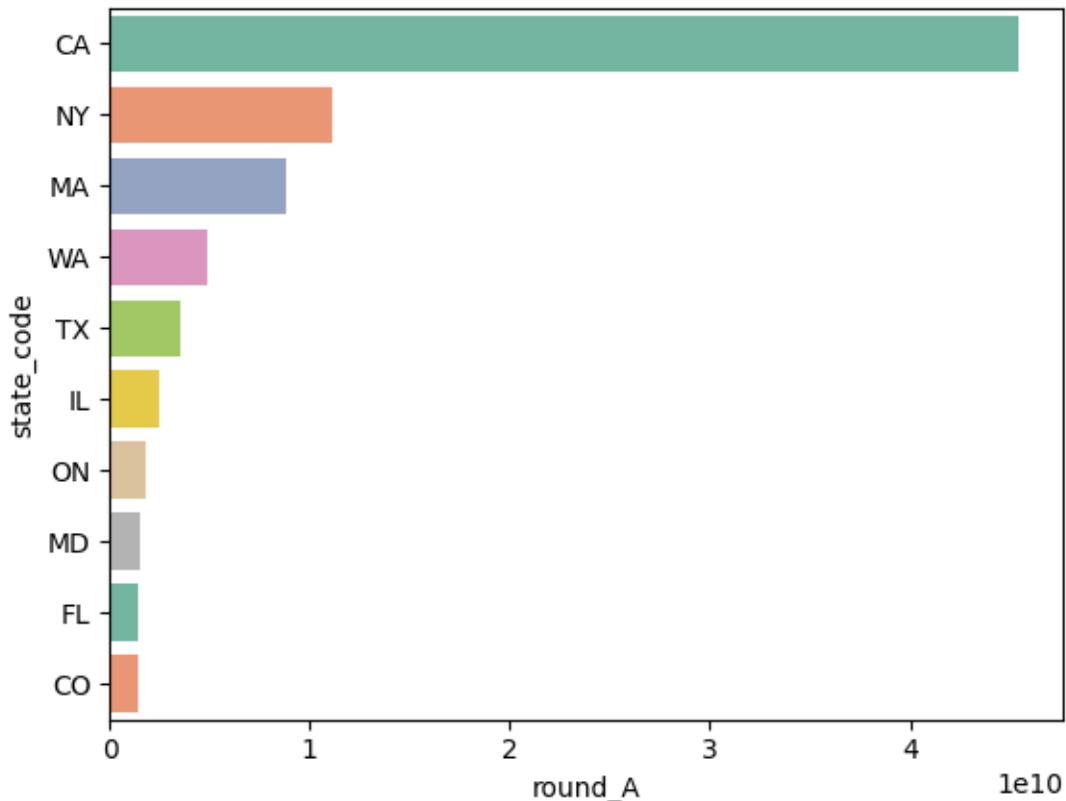
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_A', ylabel='country_code'>
```



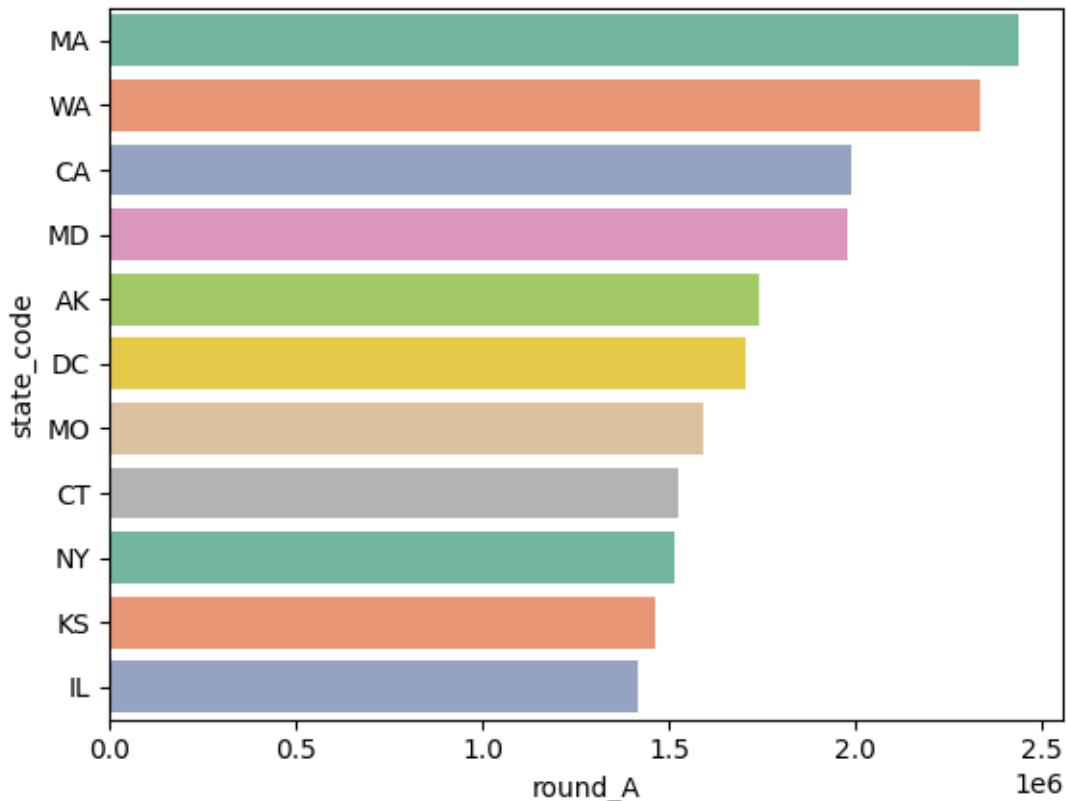
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_A', ylabel='state_code'>
```



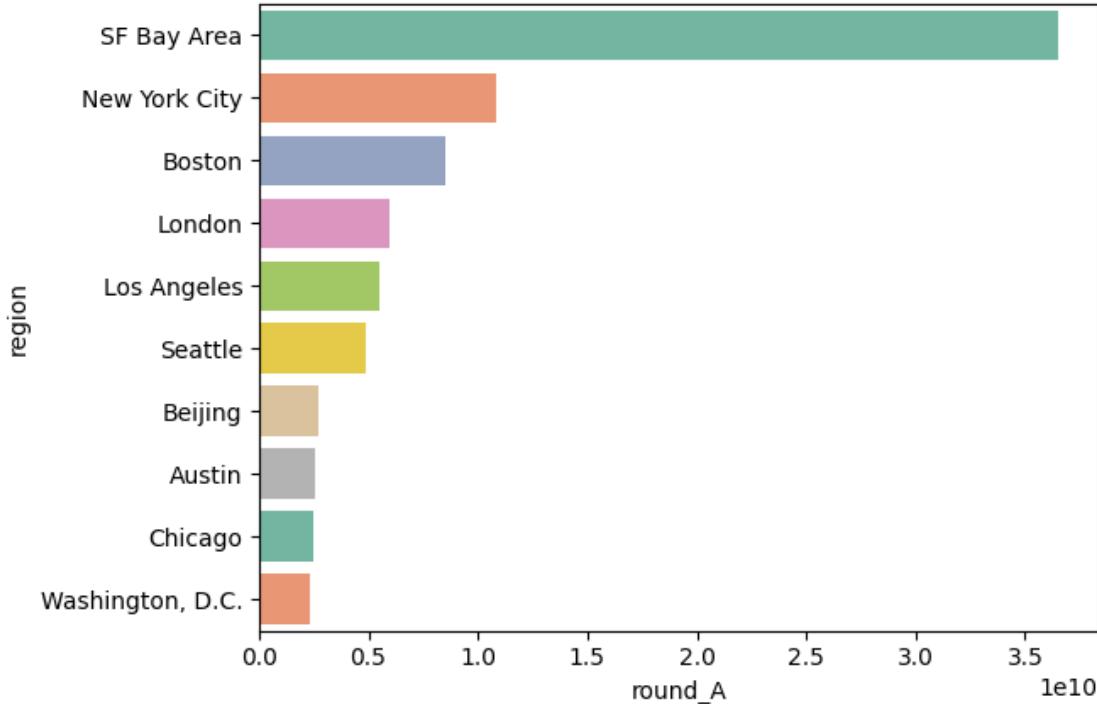
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_A', ylabel='state_code'>
```



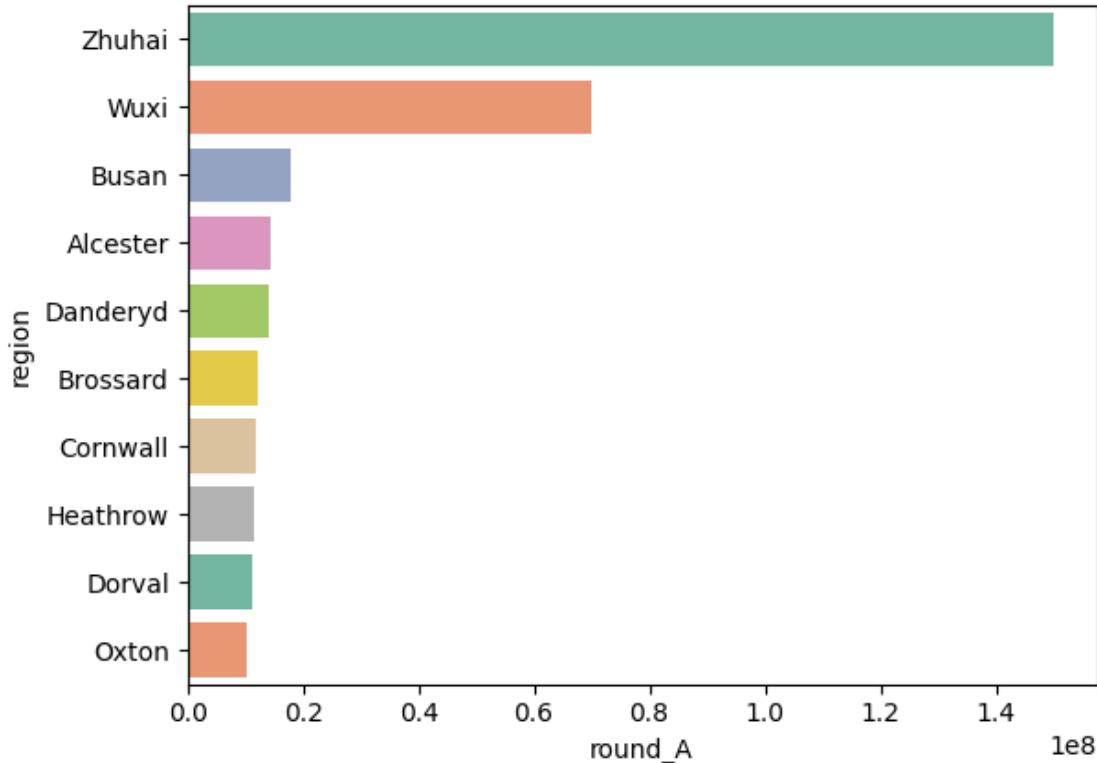
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_A', ylabel='region'>
```



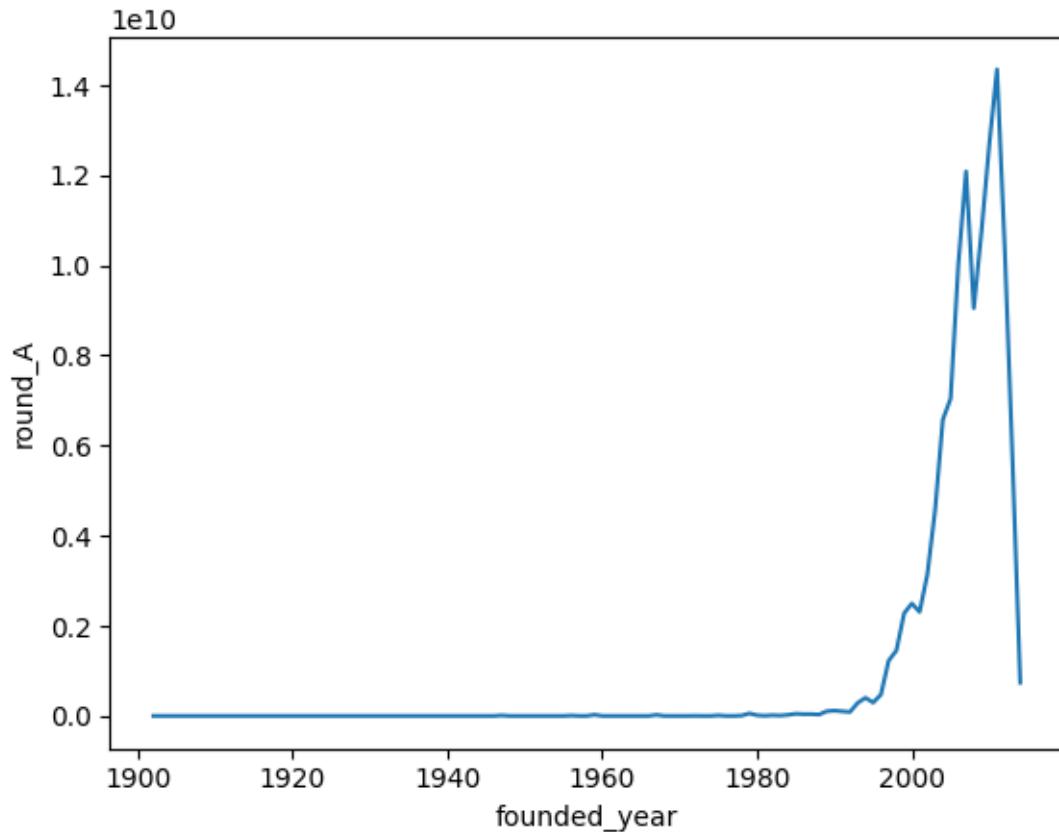
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'mean'}).reset_index()
     ↪sort_values(column, ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_A', ylabel='region'>
```



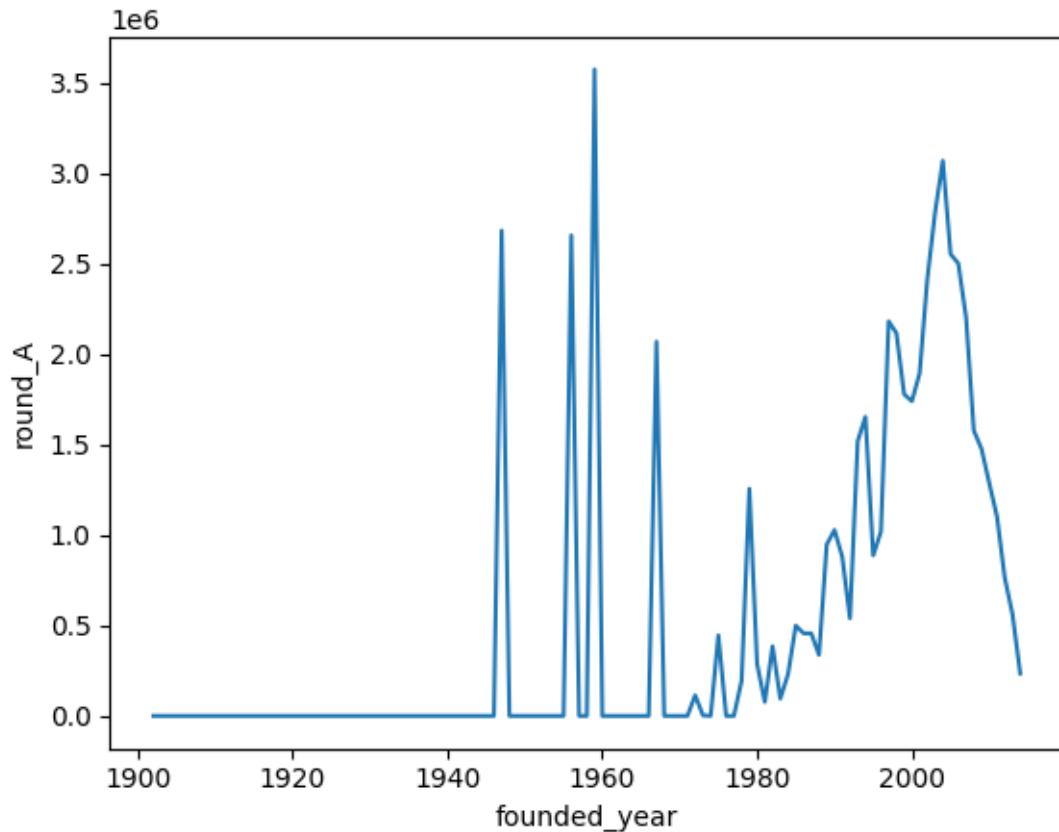
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'sum'}).reset_index().  
    ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='round_A'>
```



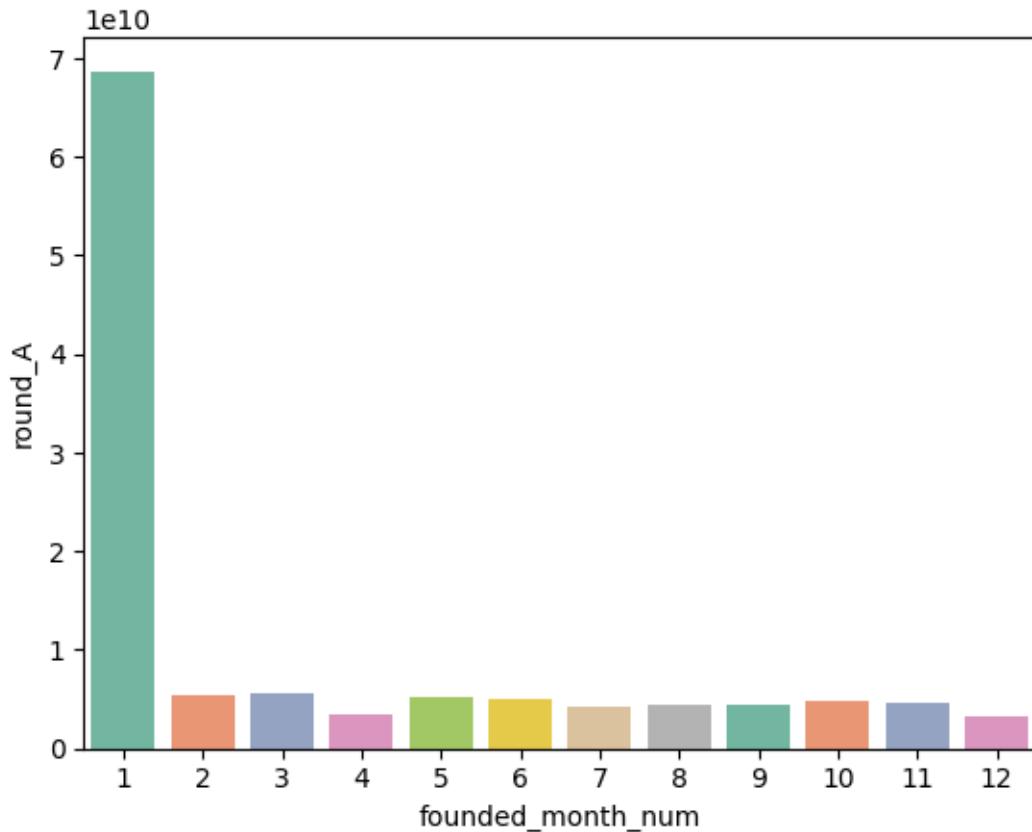
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'mean'}).reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='round_A'>
```



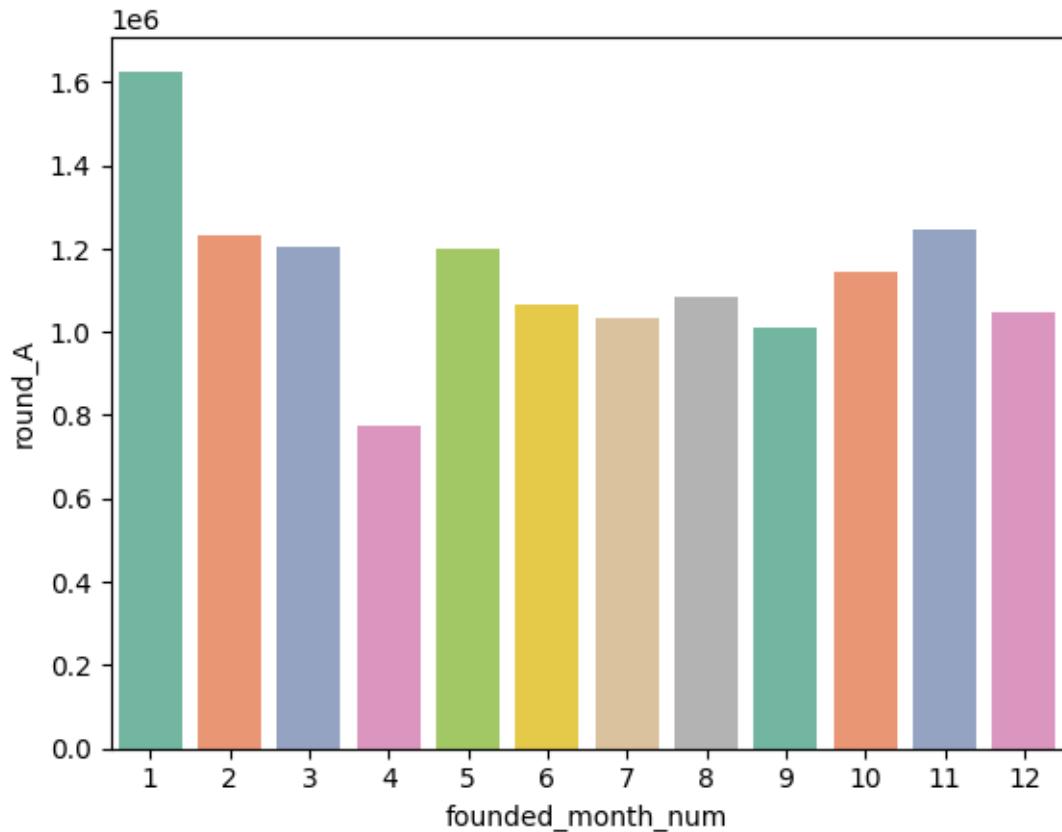
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_month_num'] > 0]  
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='round_A'>
```



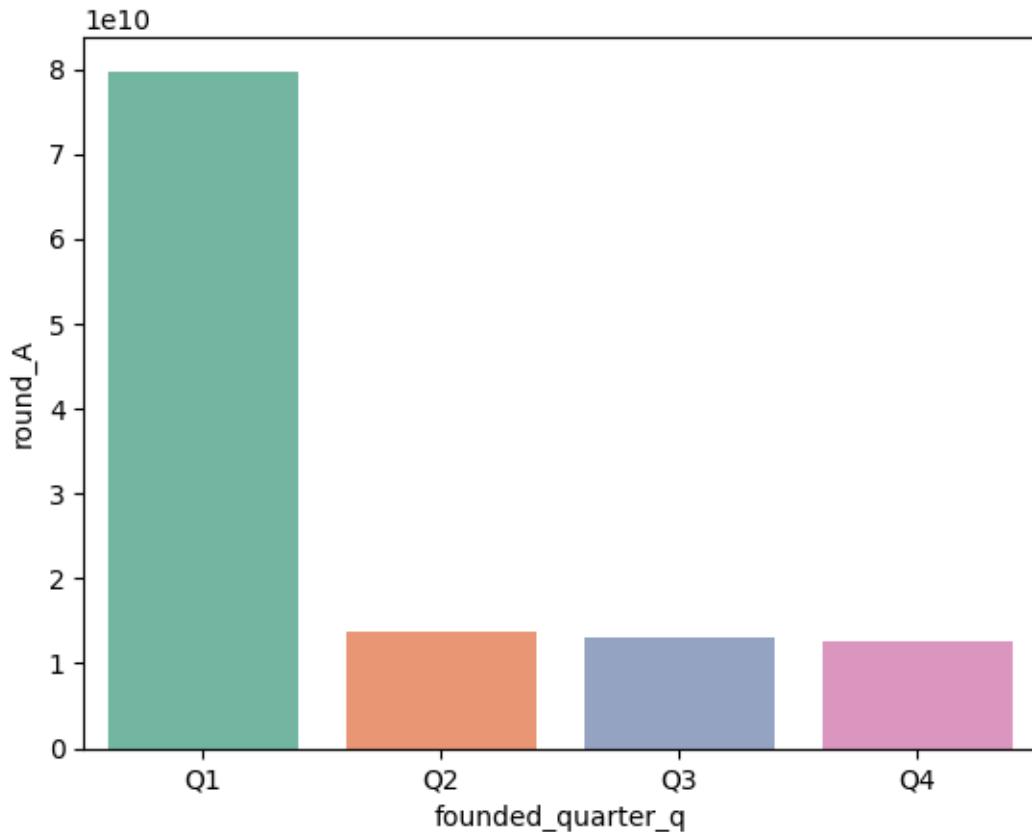
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='round_A'>
```



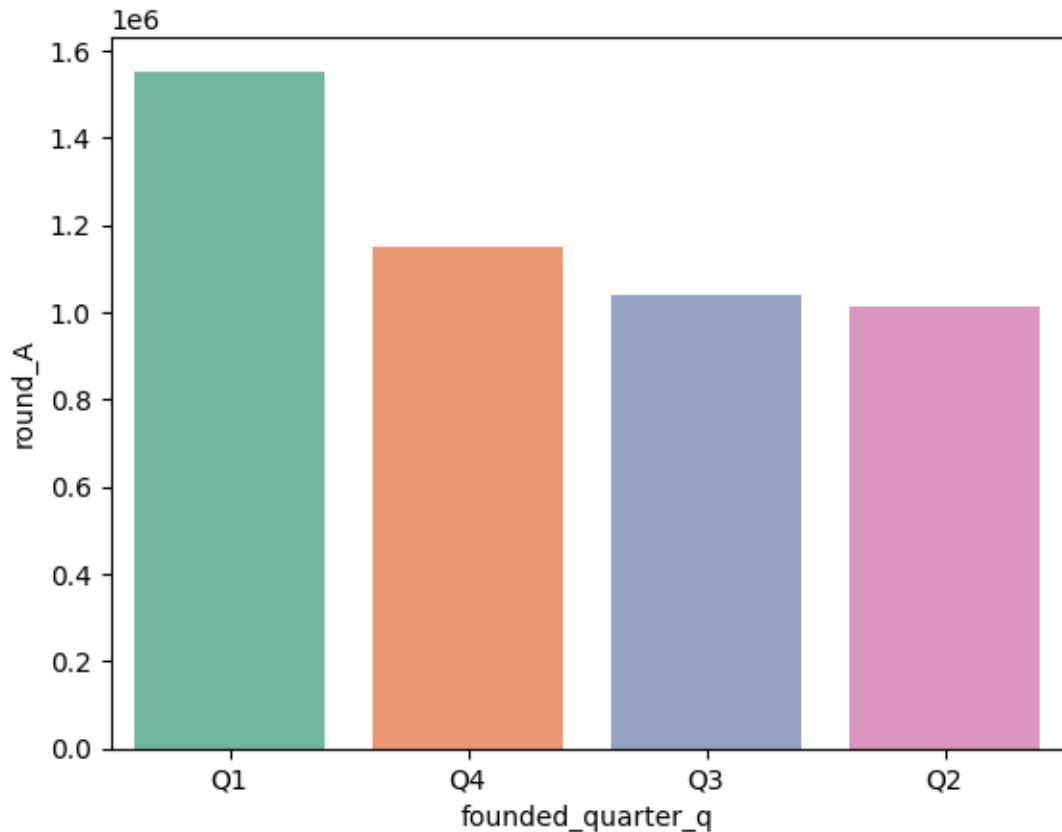
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']  
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='round_A'>
```



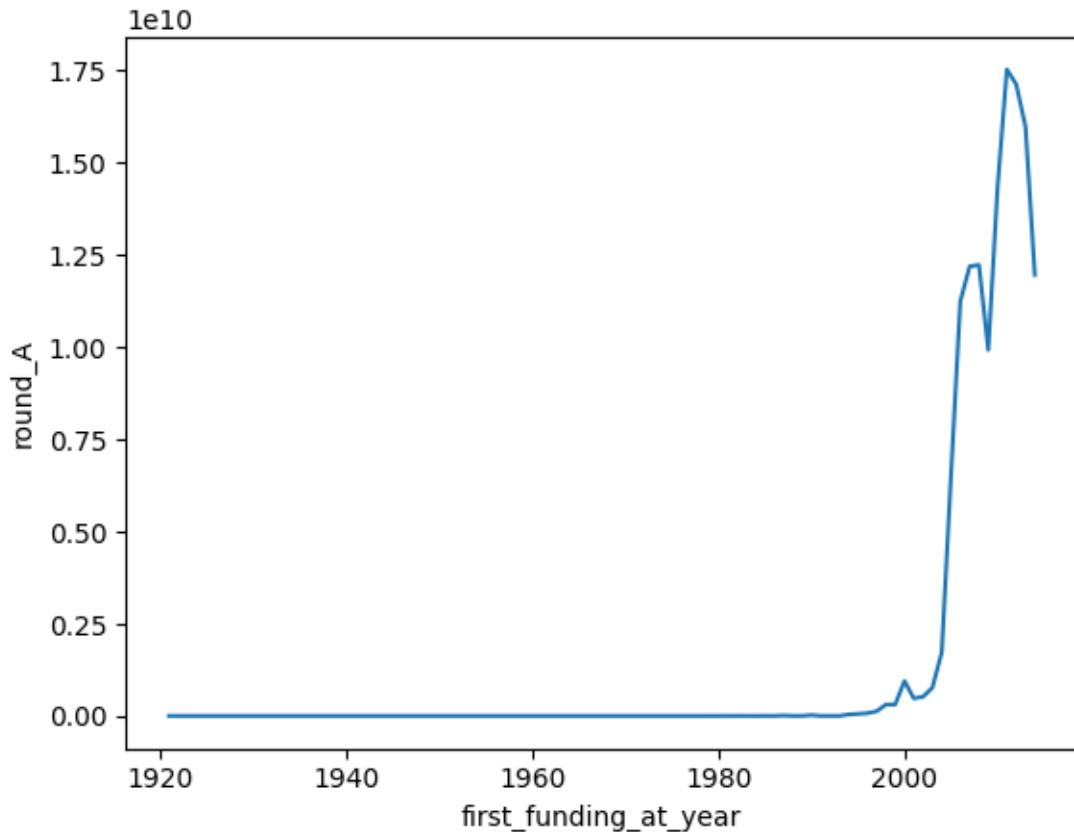
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'mean'}).
      ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='round_A'>
```



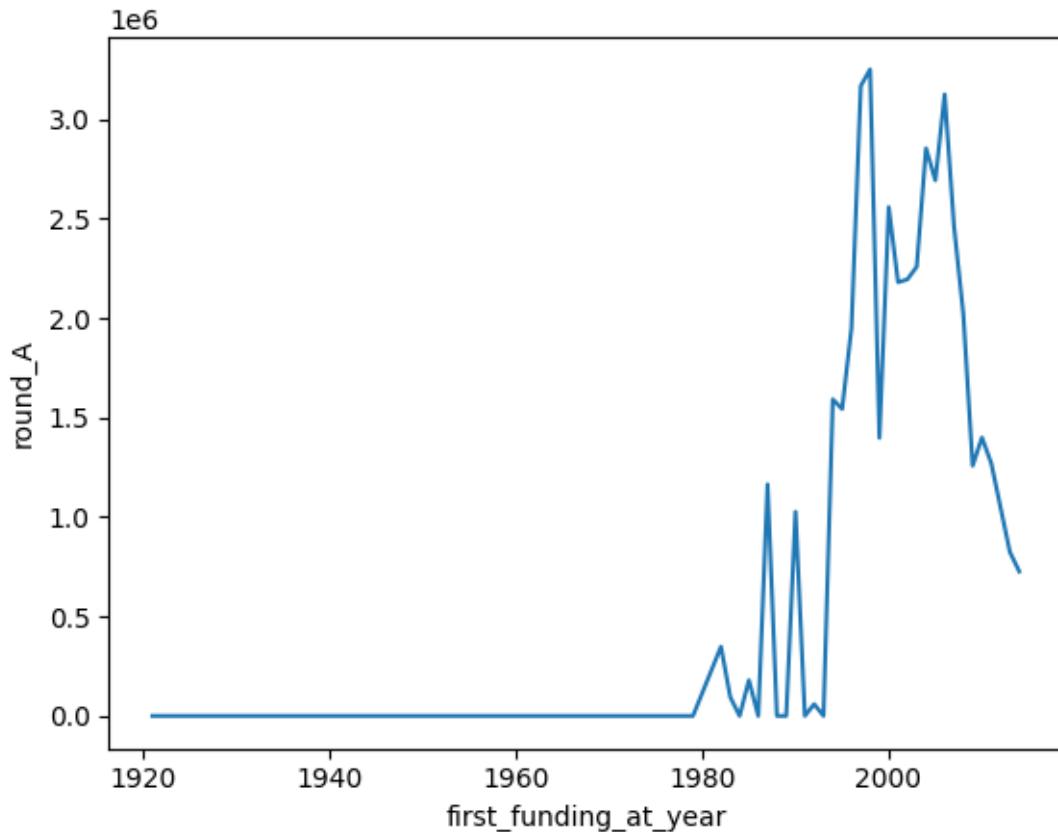
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='round_A'>
```



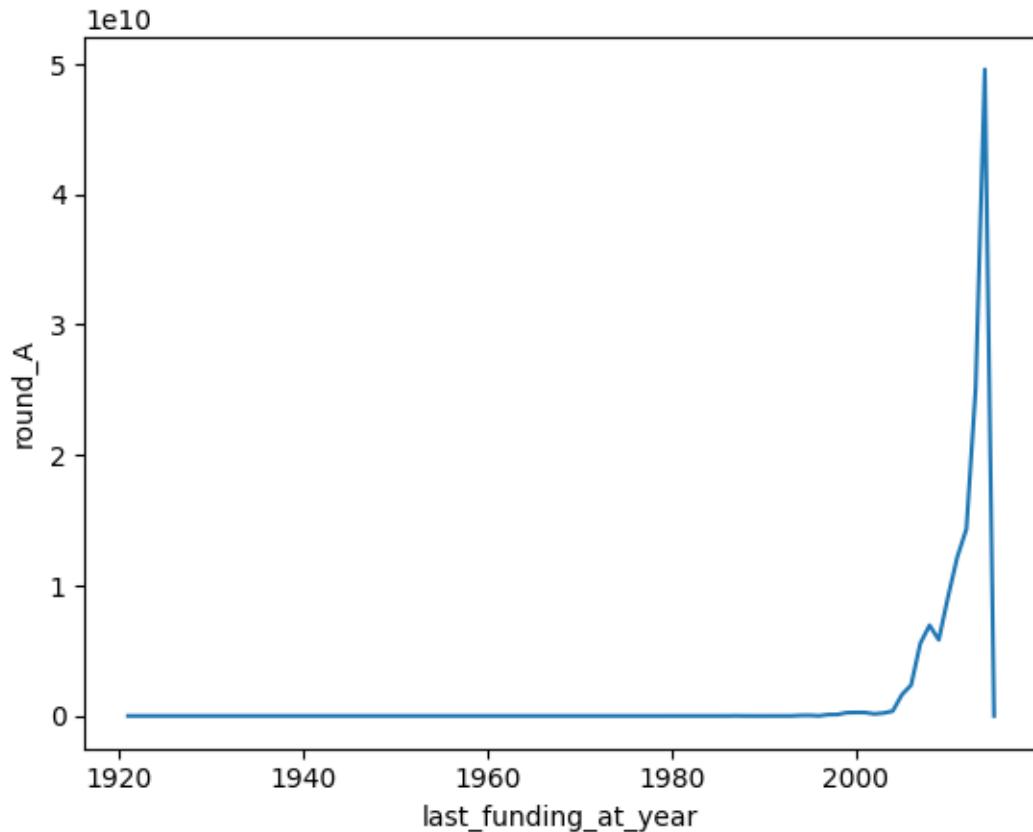
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='round_A'>
```



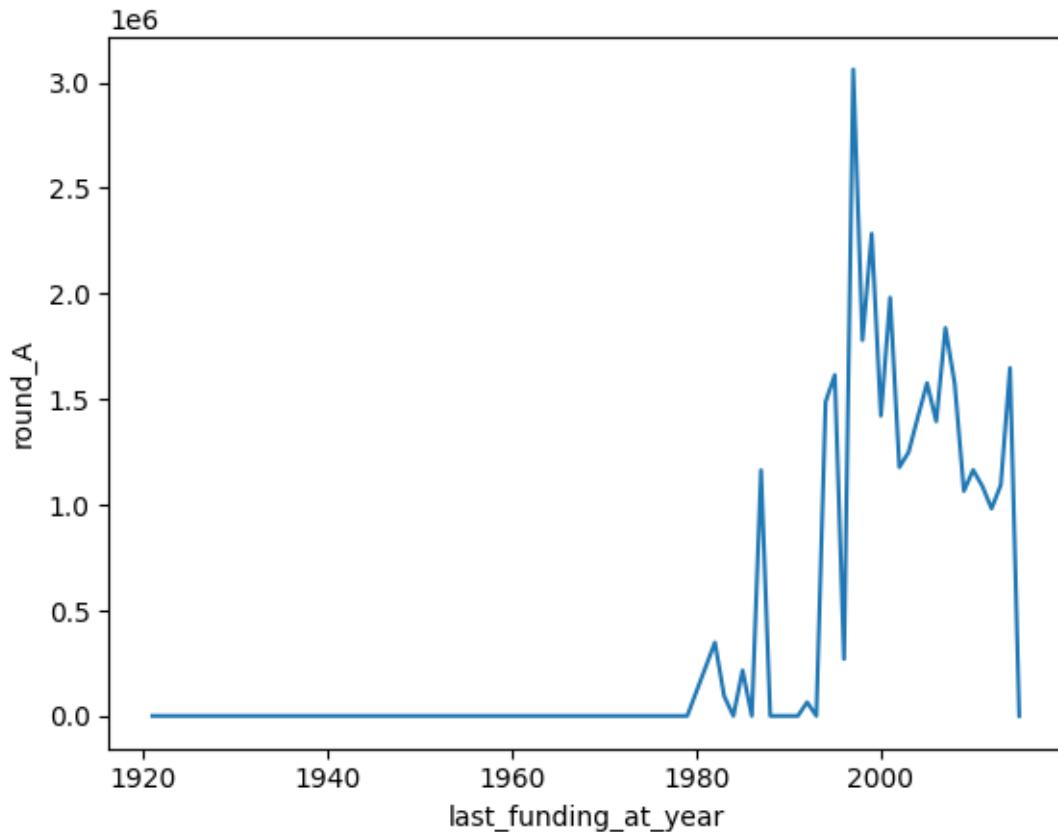
```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='round_A'>
```



```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='round_A'>
```



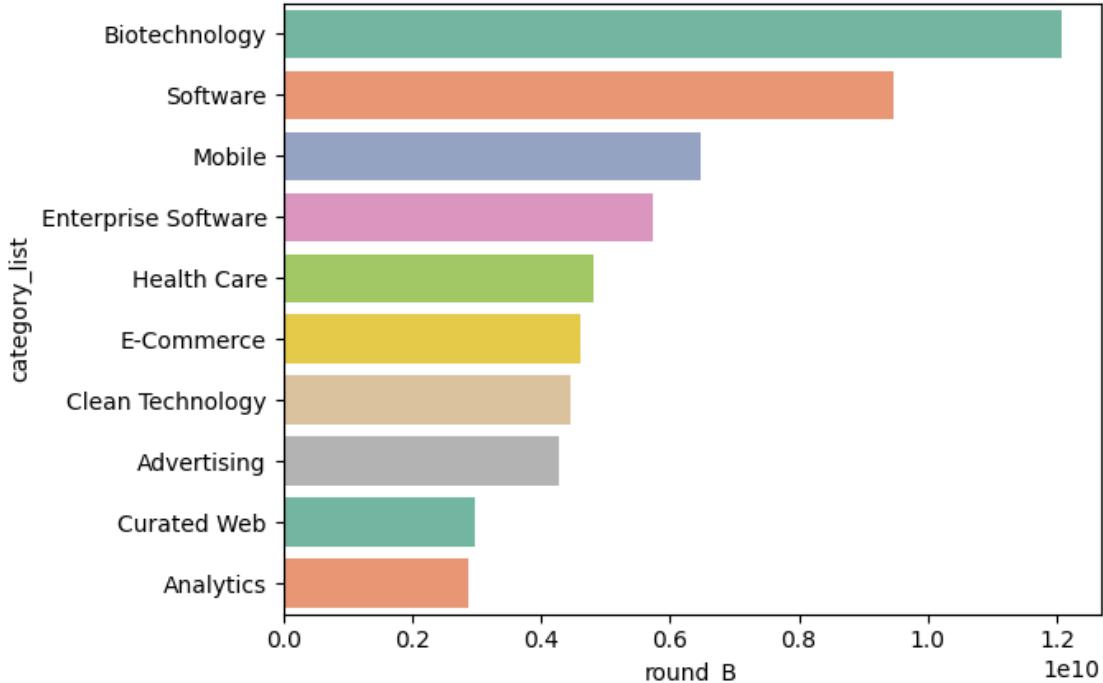
## 1.19 Round\_B

Average and Total Analysis of the Round B Funds as shown below.

```
[ ]: column = 'round_B'

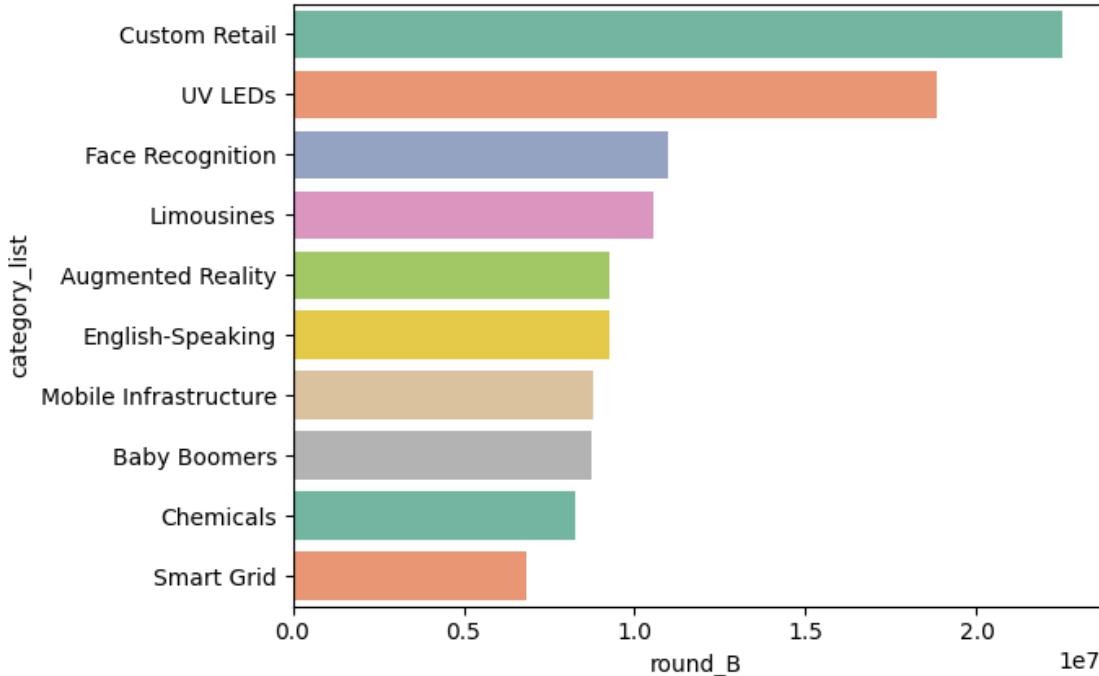
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'sum'}).reset_index() .
    .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')

[ ]: <Axes: xlabel='round_B', ylabel='category_list'>
```



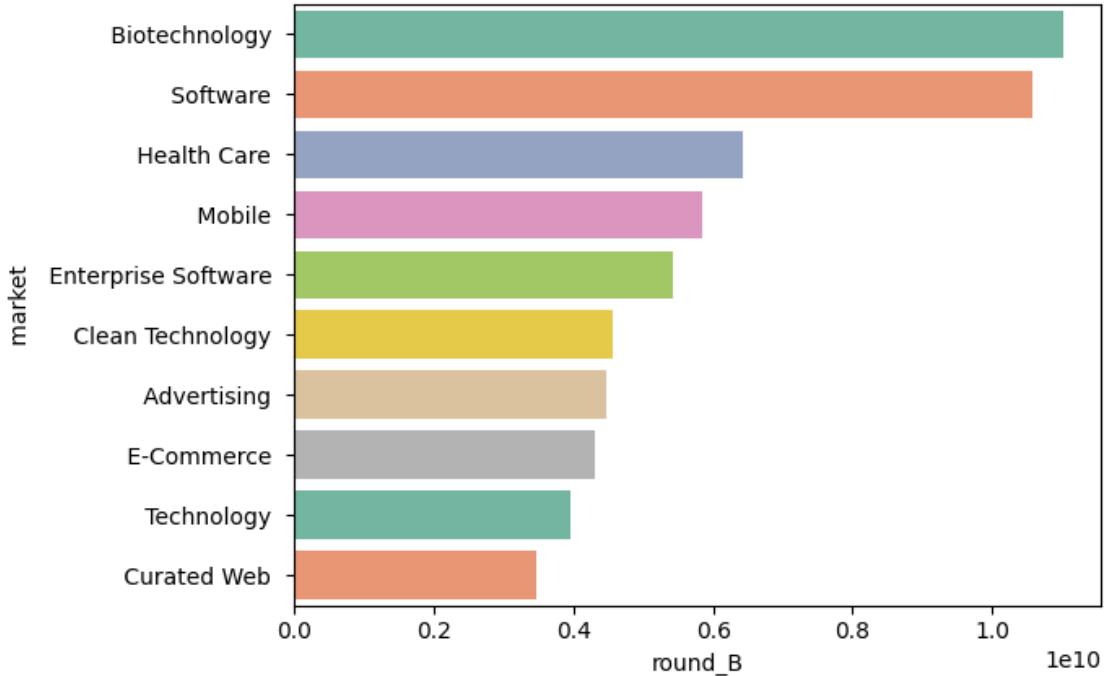
```
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_B', ylabel='category_list'>
```



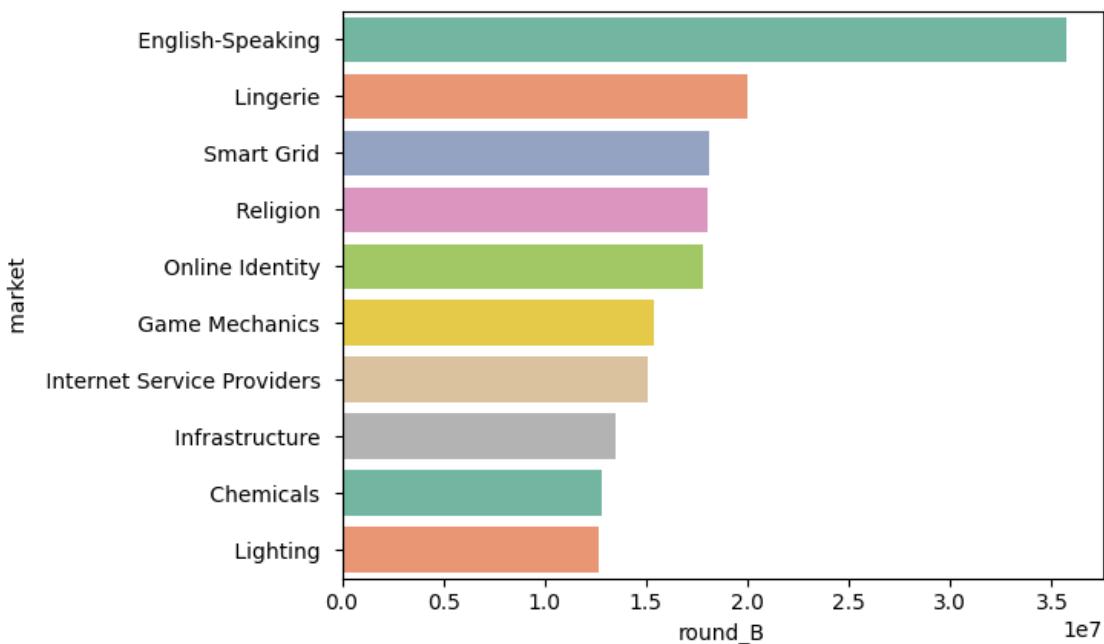
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'sum'}).reset_index().  
      ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='round_B', ylabel=' market '>
```



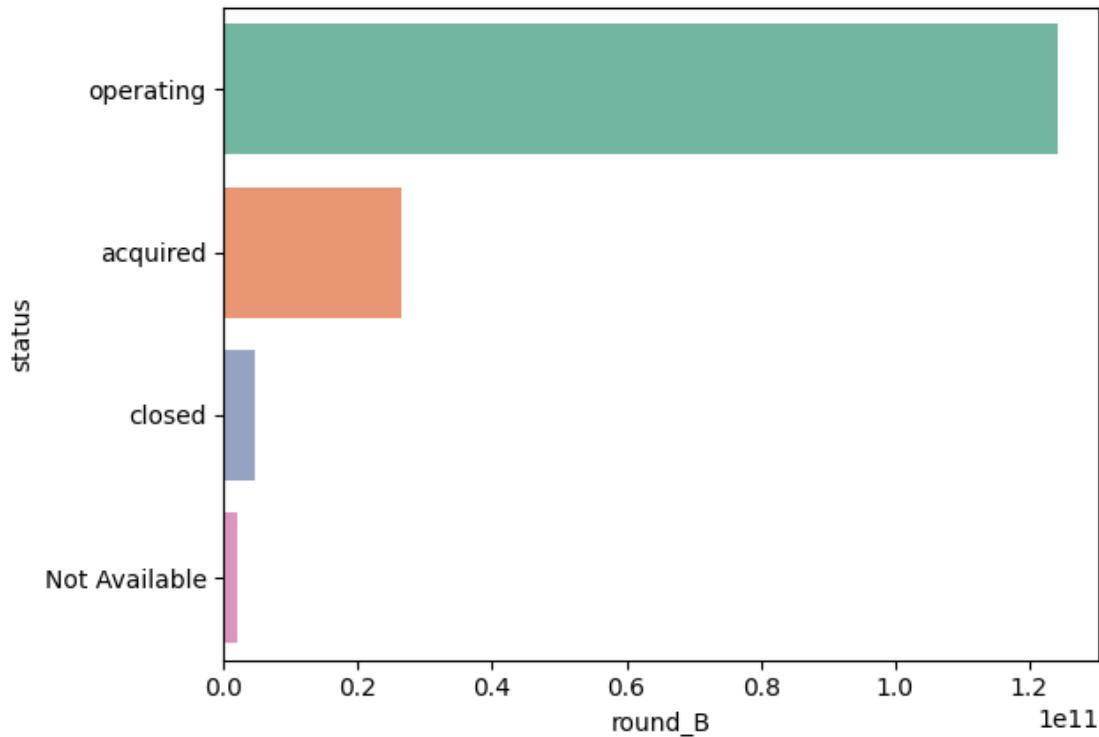
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'mean'}).reset_index()
      ↪sort_values(column,ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

[ ]: <Axes: xlabel='round\_B', ylabel=' market '>



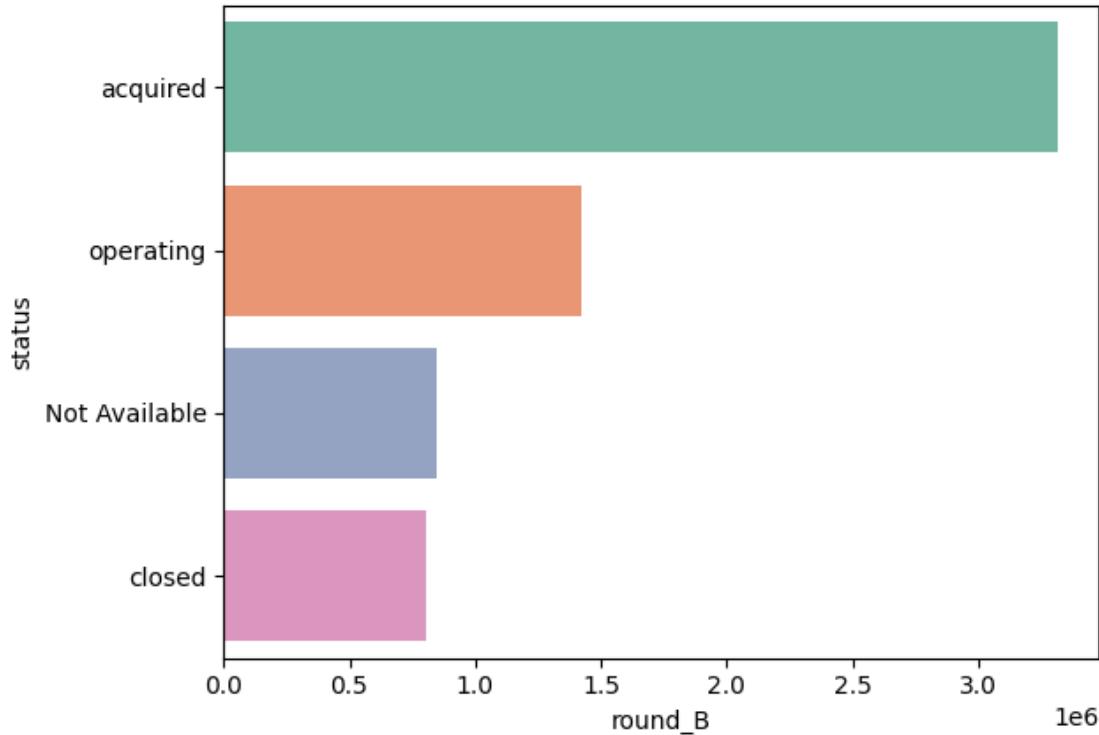
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_B', ylabel='status'>
```



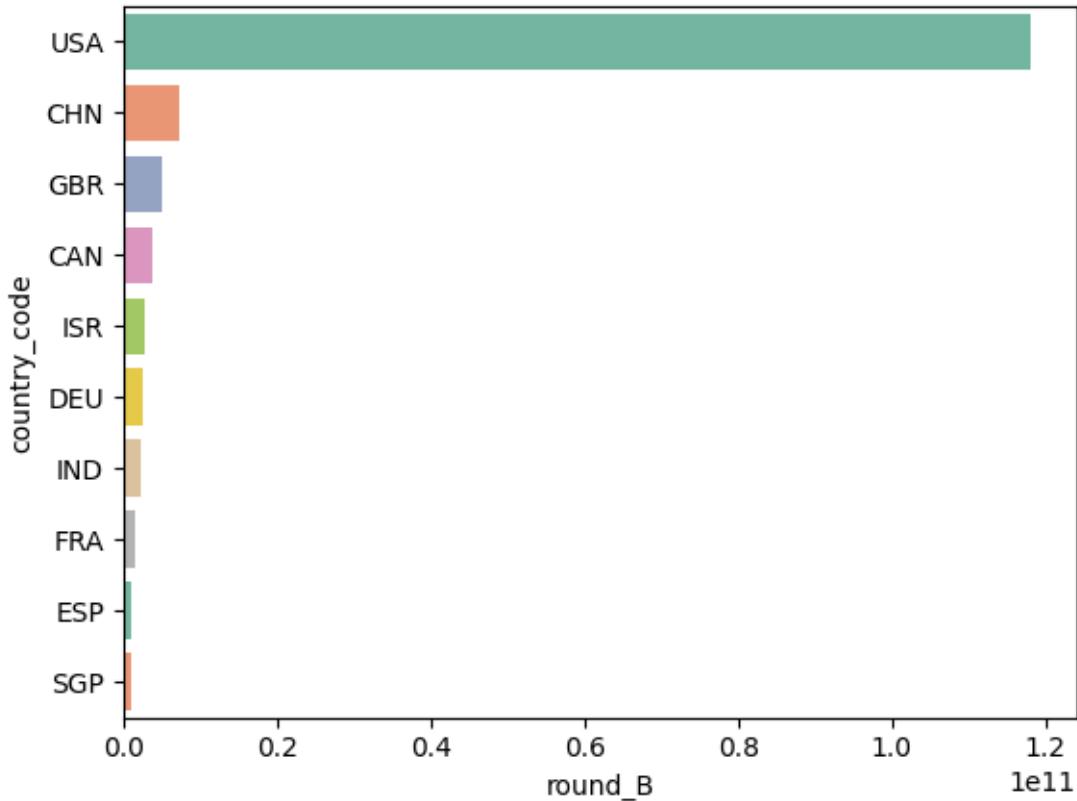
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'mean'}).reset_index() .
    ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_B', ylabel='status'>
```



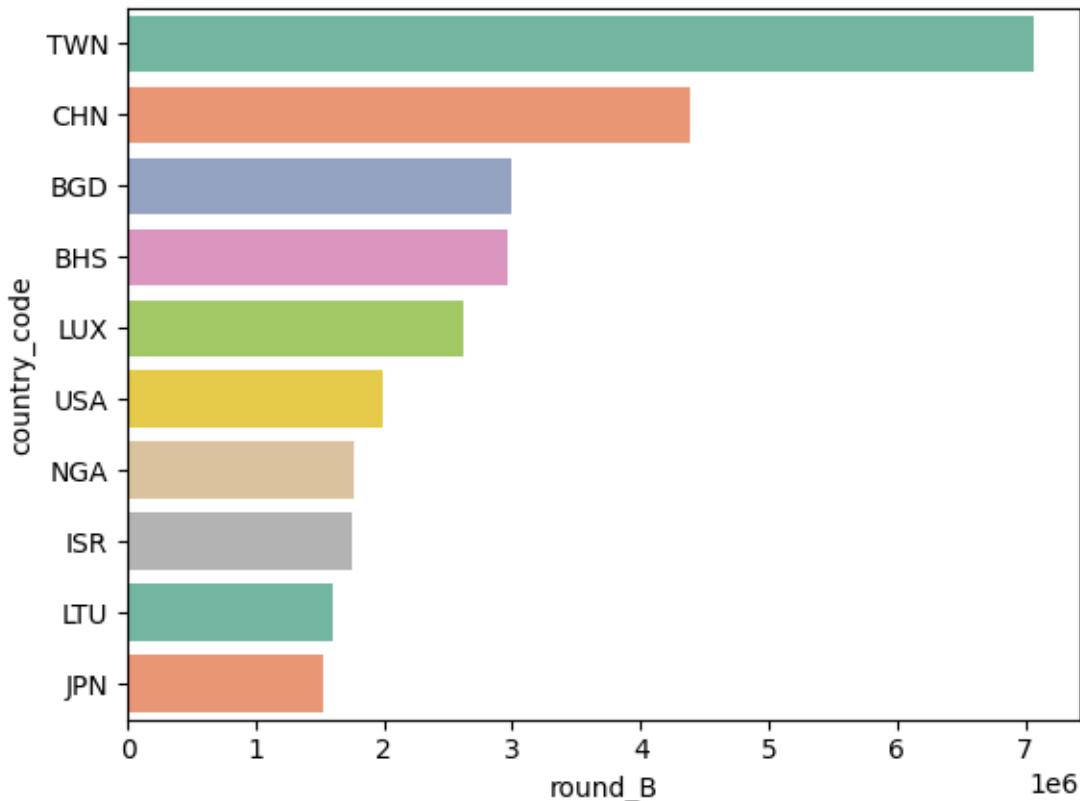
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'sum'}).reset_index().  
     .sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_B', ylabel='country_code'>
```



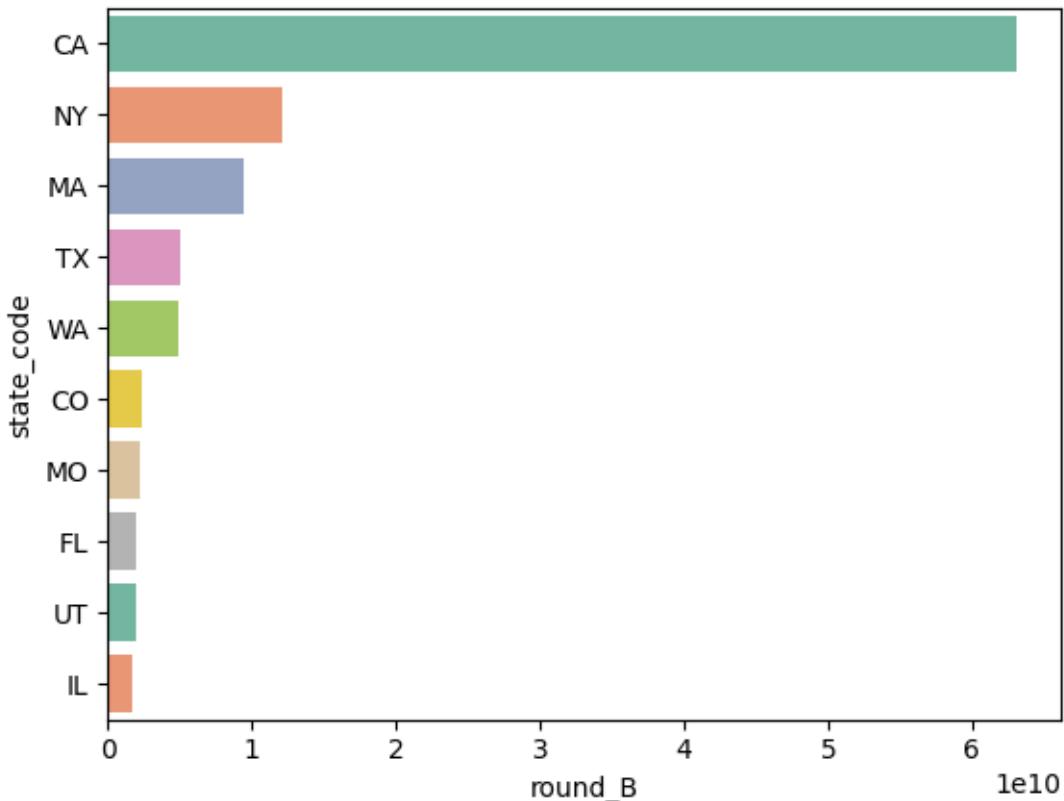
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_B', ylabel='country_code'>
```



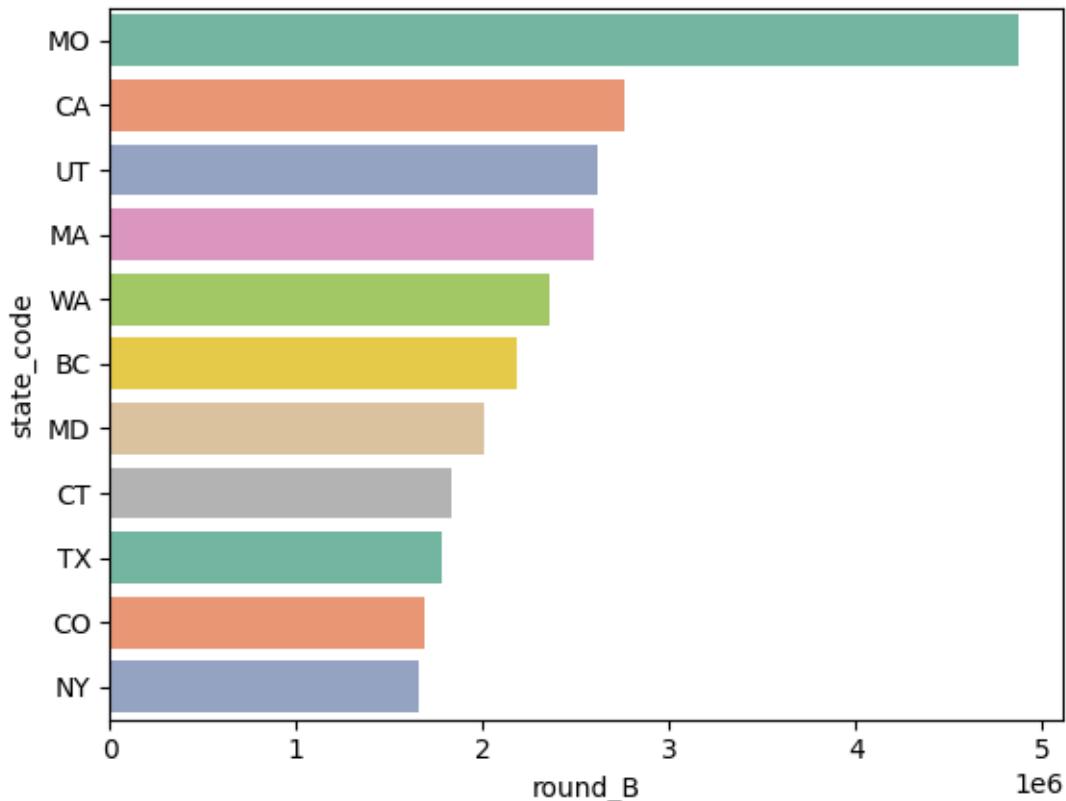
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'sum'}).reset_index().  
     ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_B', ylabel='state_code'>
```



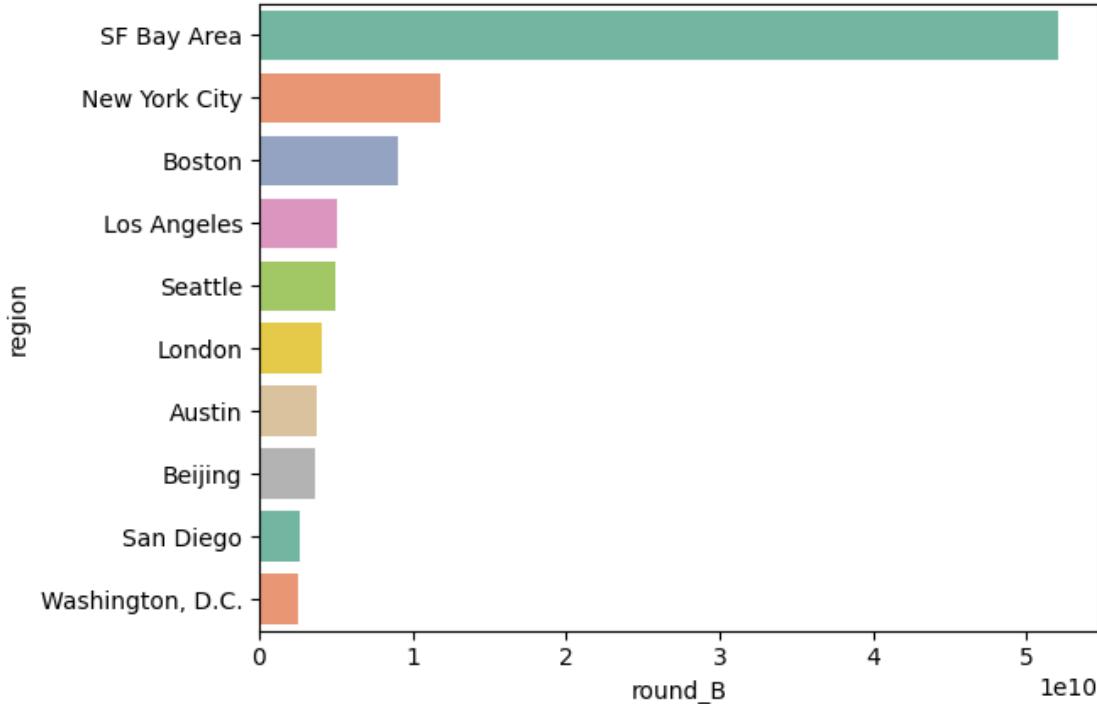
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'mean'}).reset_index().  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_B', ylabel='state_code'>
```



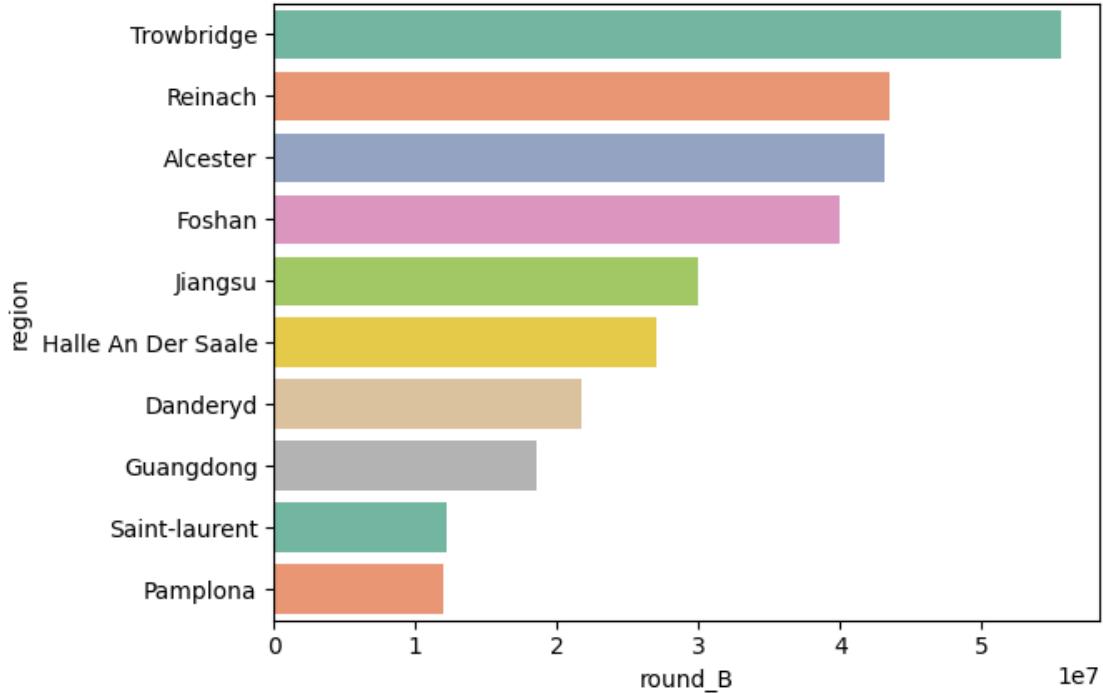
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_B', ylabel='region'>
```



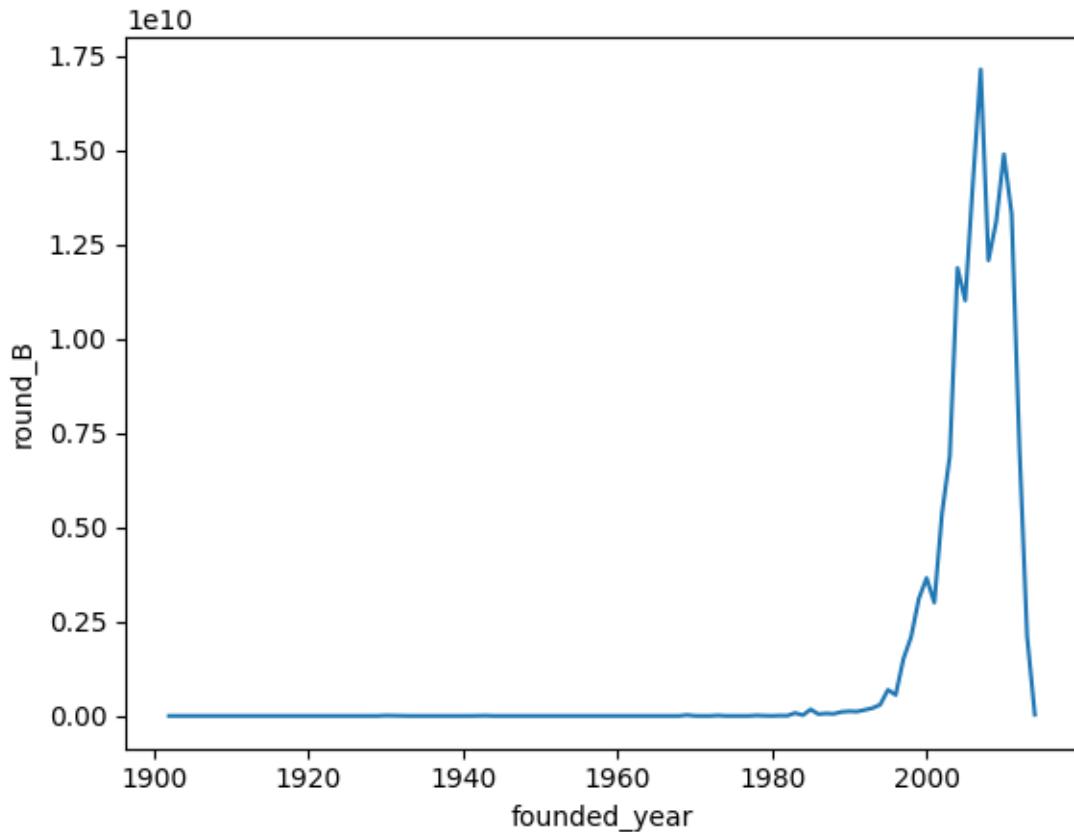
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'mean'}).reset_index()
     ↪sort_values(column, ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_B', ylabel='region'>
```



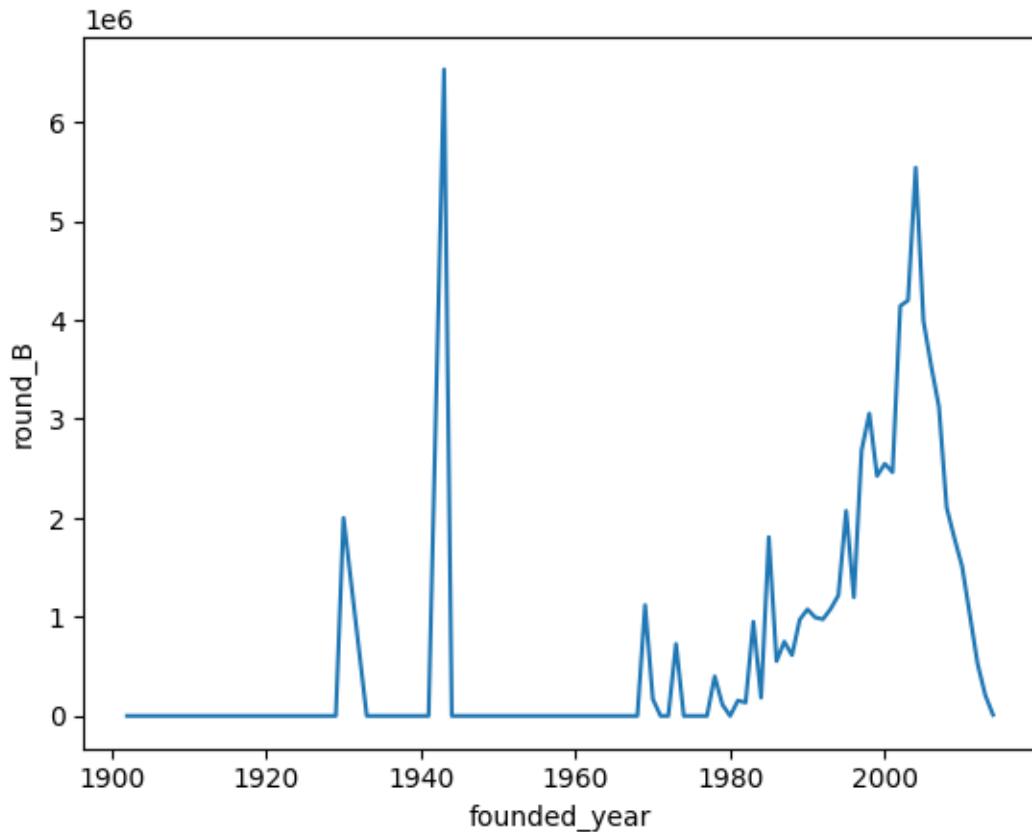
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'sum'}).reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='round_B'>
```



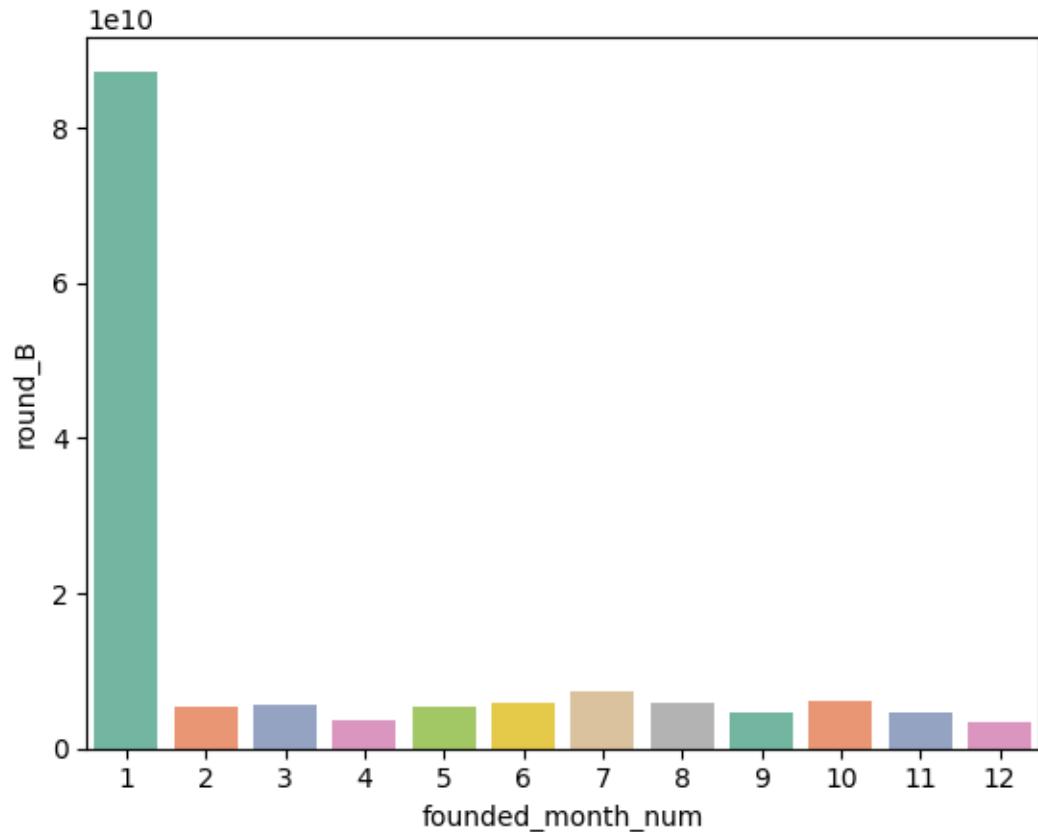
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='round_B'>
```



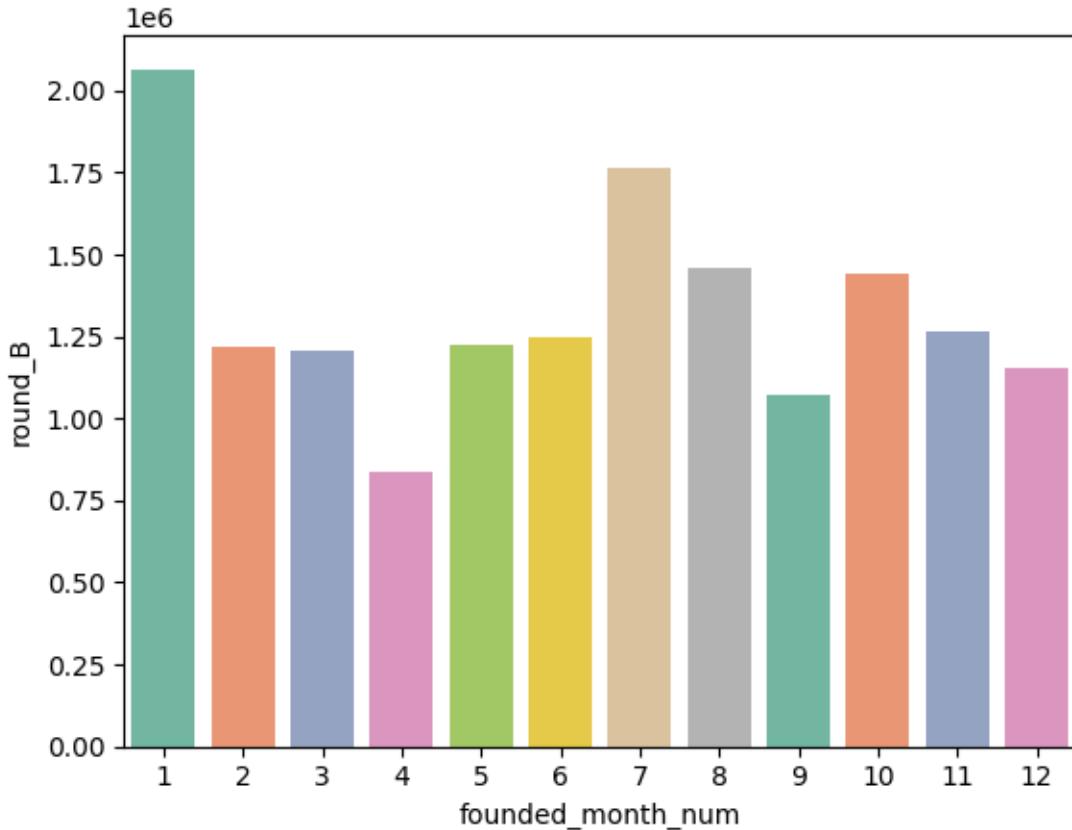
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'sum'}).
    ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='round_B'>
```



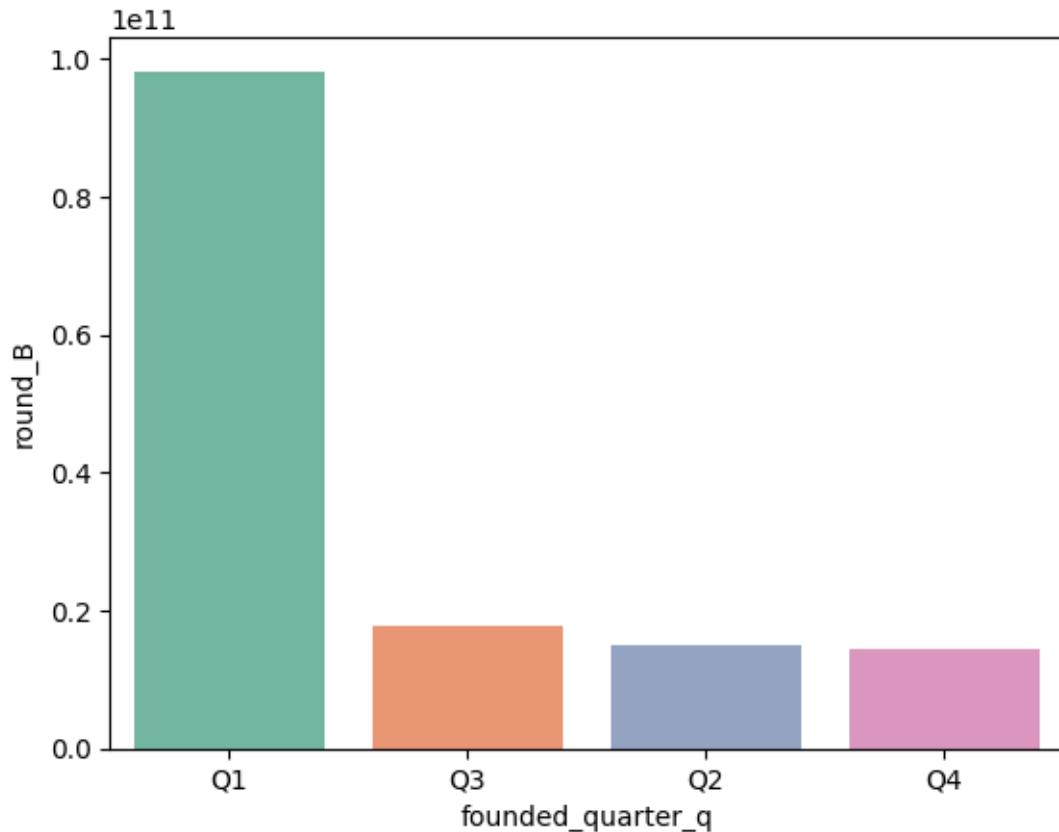
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='round_B'>
```



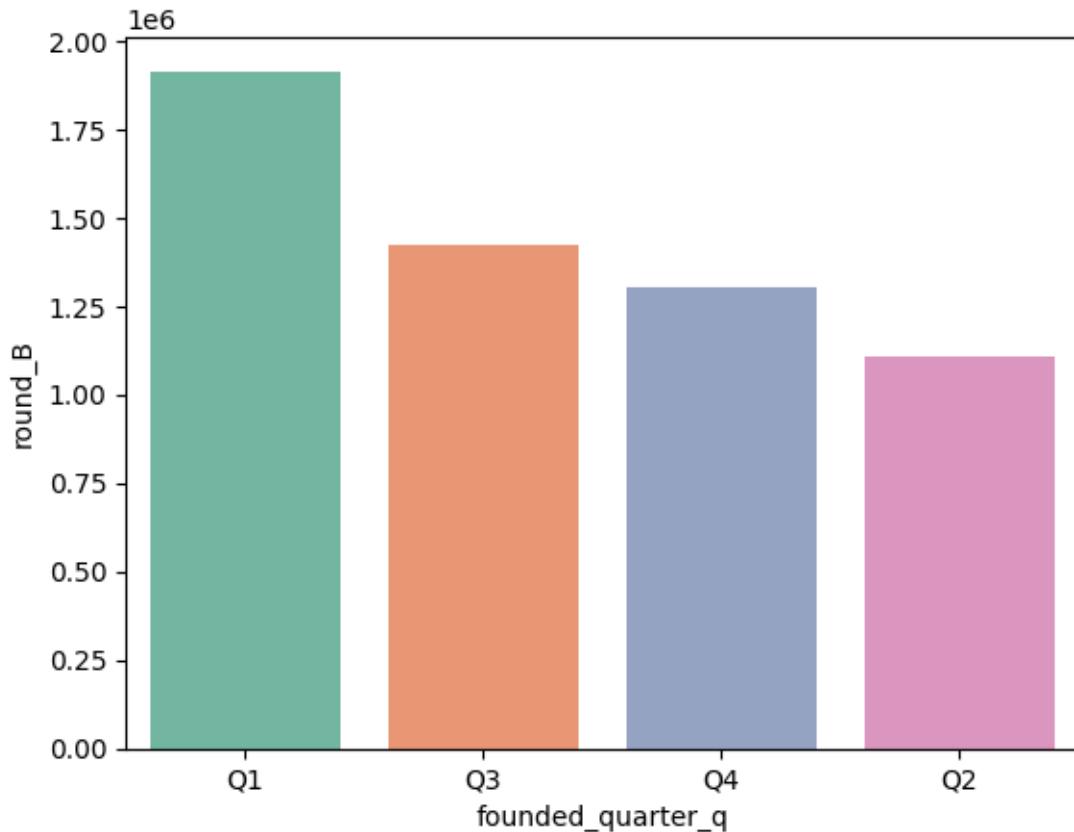
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'sum'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='round_B'>
```



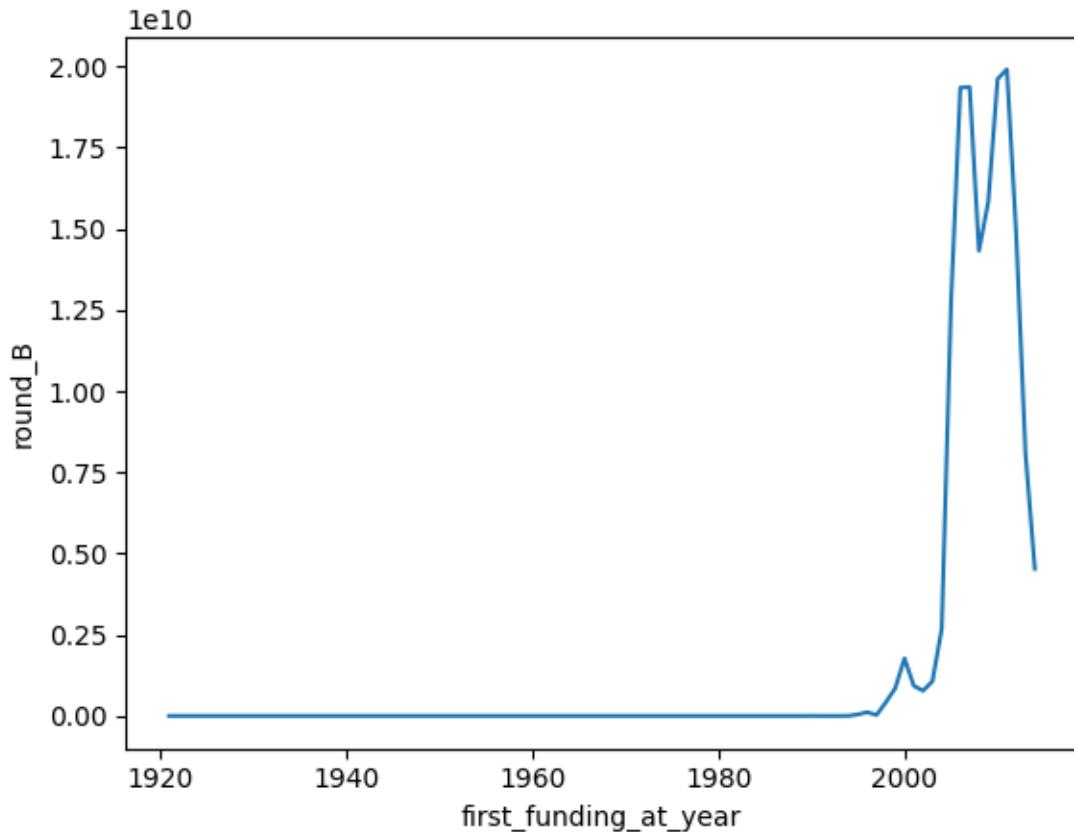
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='round_B'>
```



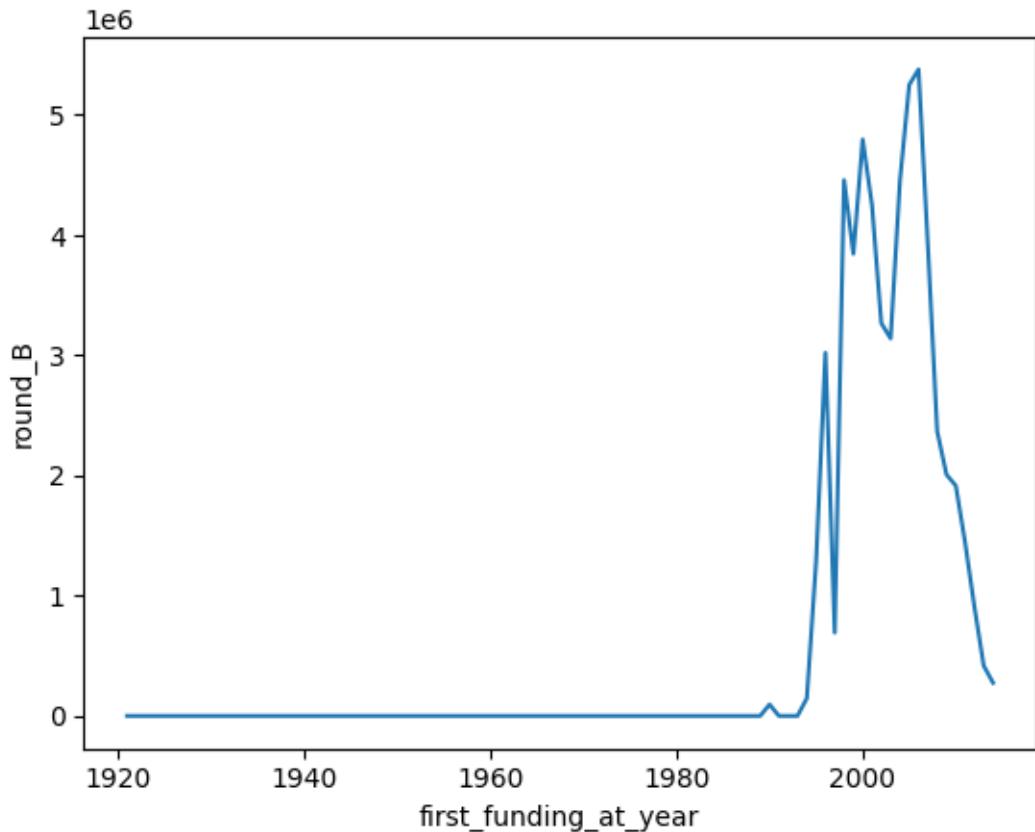
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='round_B'>
```



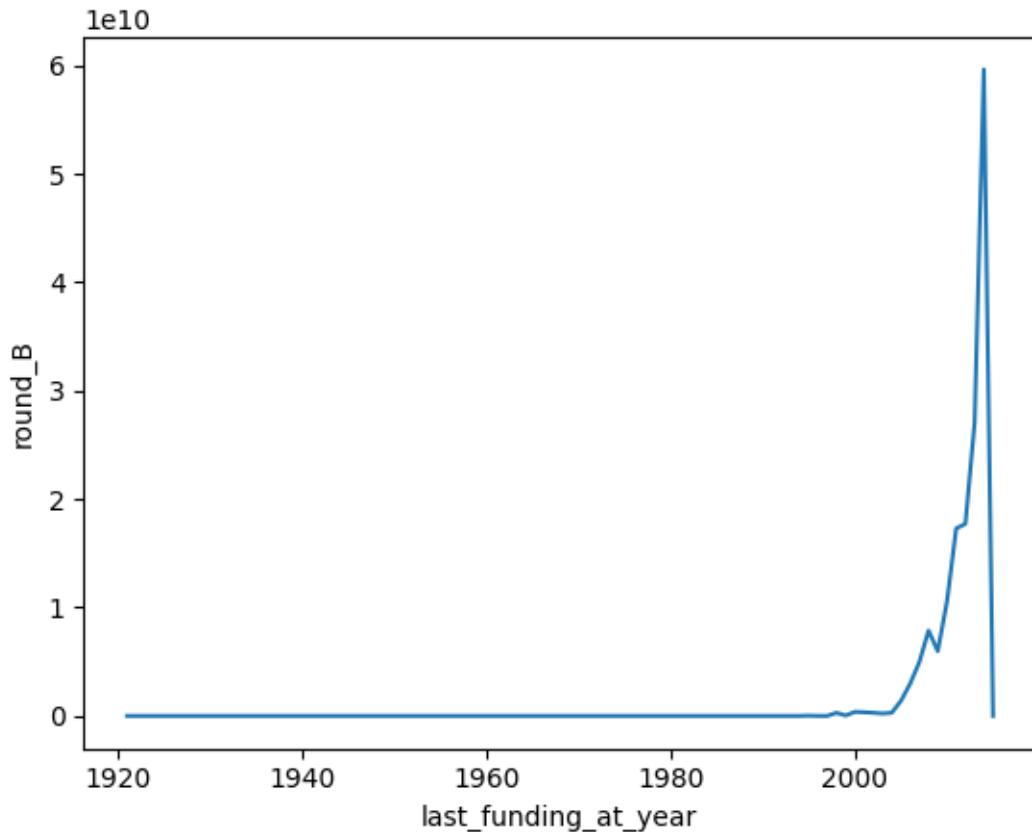
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='round_B'>
```



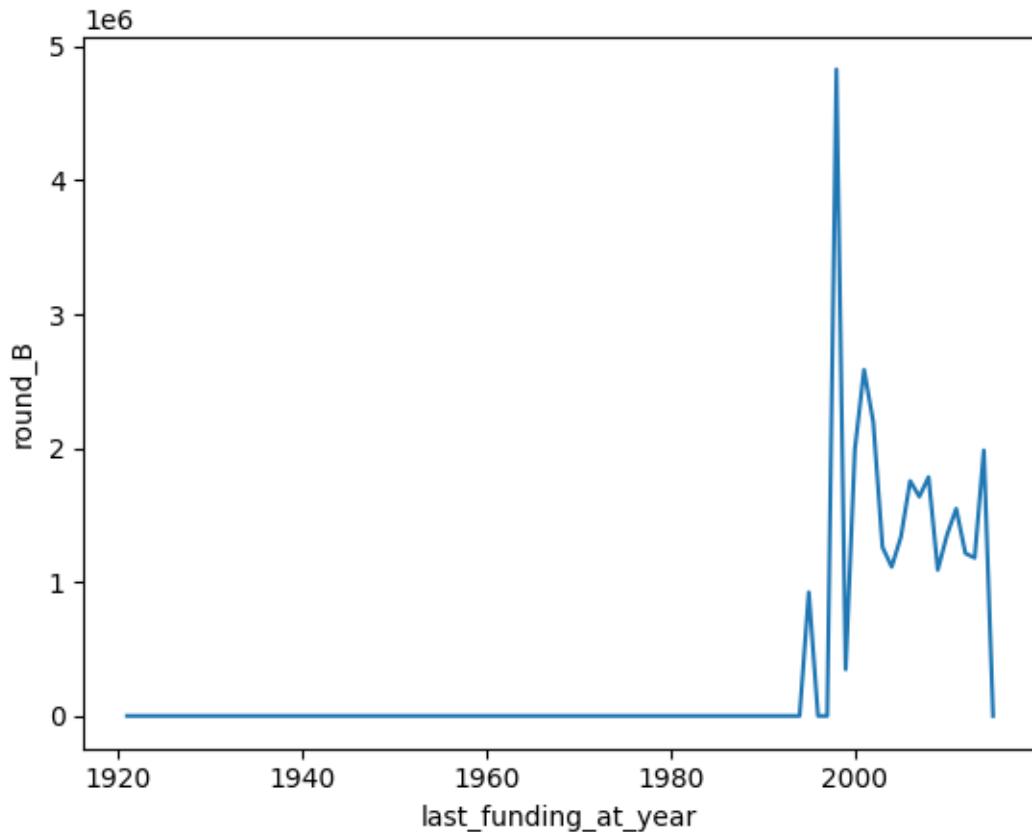
```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='round_B'>
```



```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'mean'}).
    ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='round_B'>
```



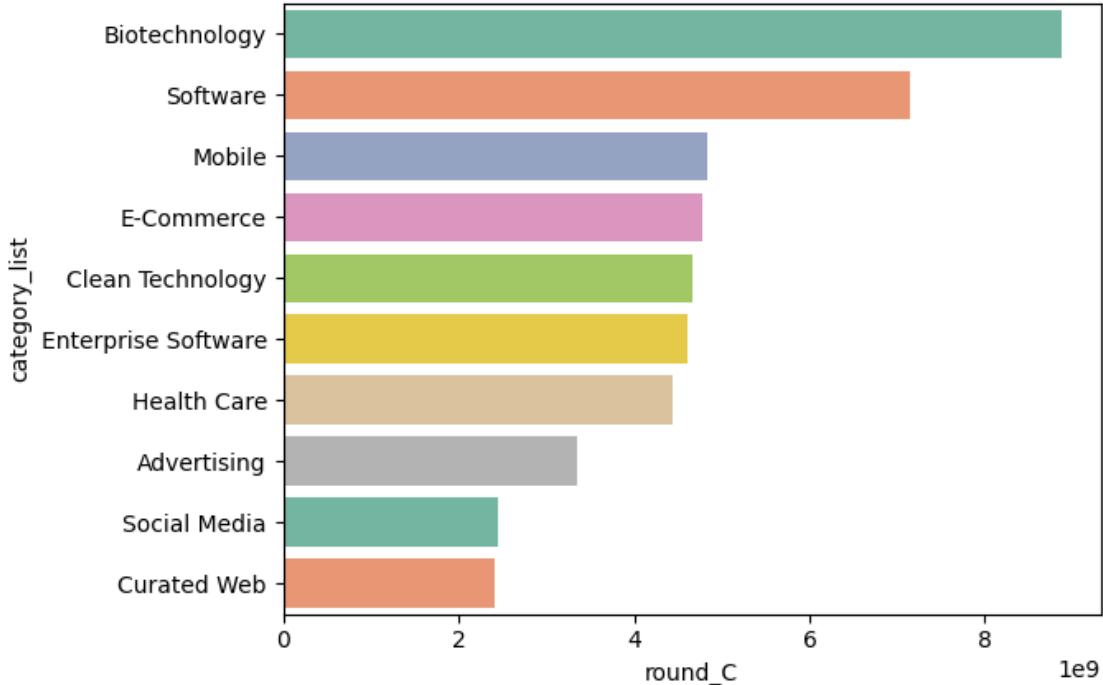
## 1.20 Round\_C

Average and Total Analysis of the Round C Funds as shown below.

```
[ ]: column = 'round_C'

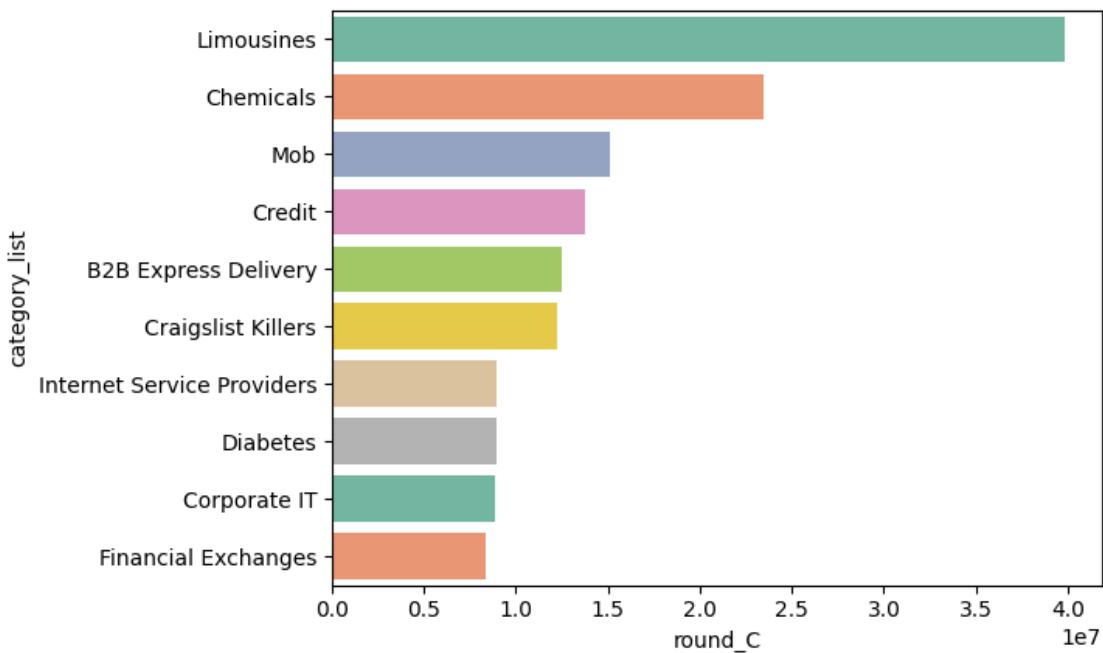
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'sum'}).reset_index() .
    .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')

[ ]: <Axes: xlabel='round_C', ylabel='category_list'>
```



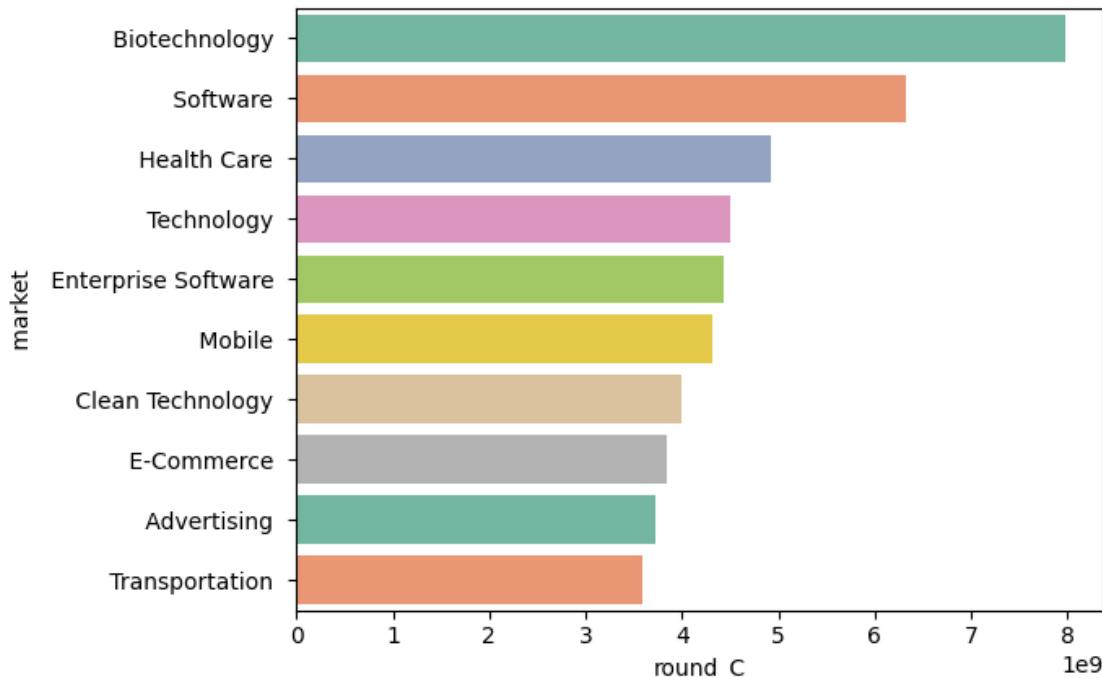
```
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'mean'}).reset_index() .
    ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_C', ylabel='category_list'>
```



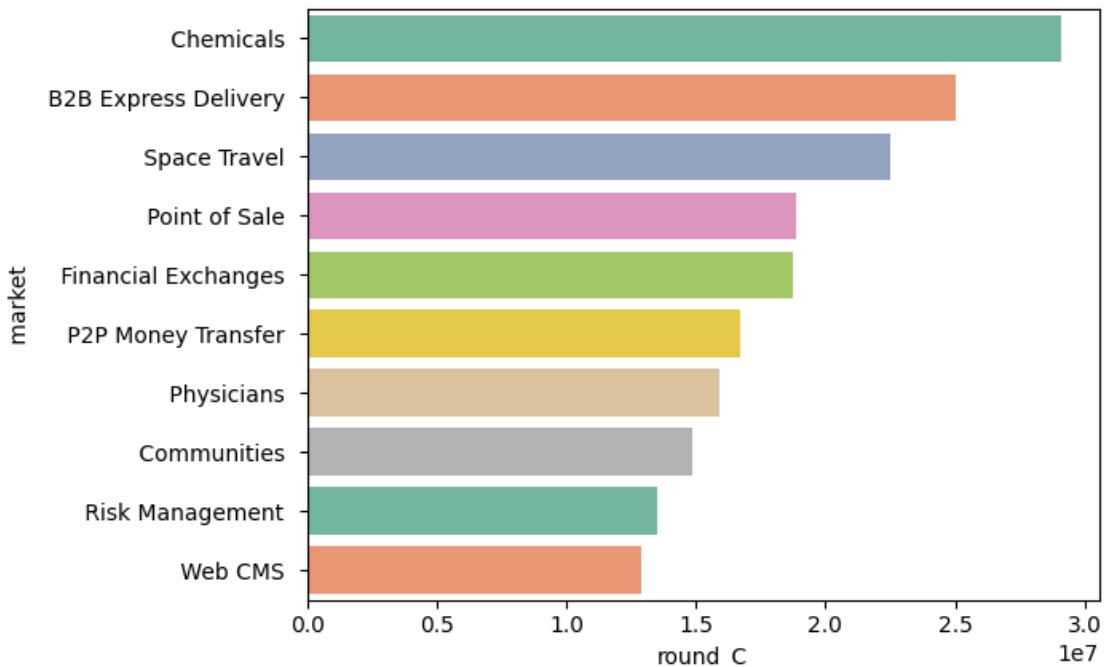
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'sum'}).reset_index() .  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='round_C', ylabel=' market '>
```



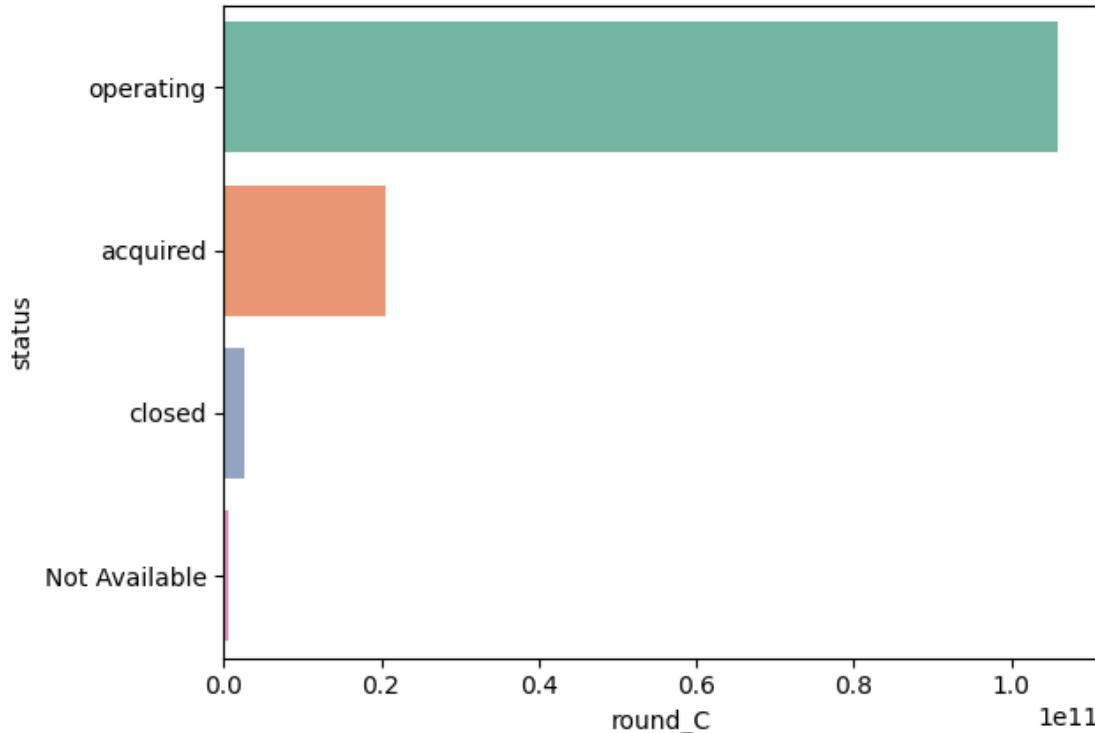
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='round_C', ylabel=' market '>
```



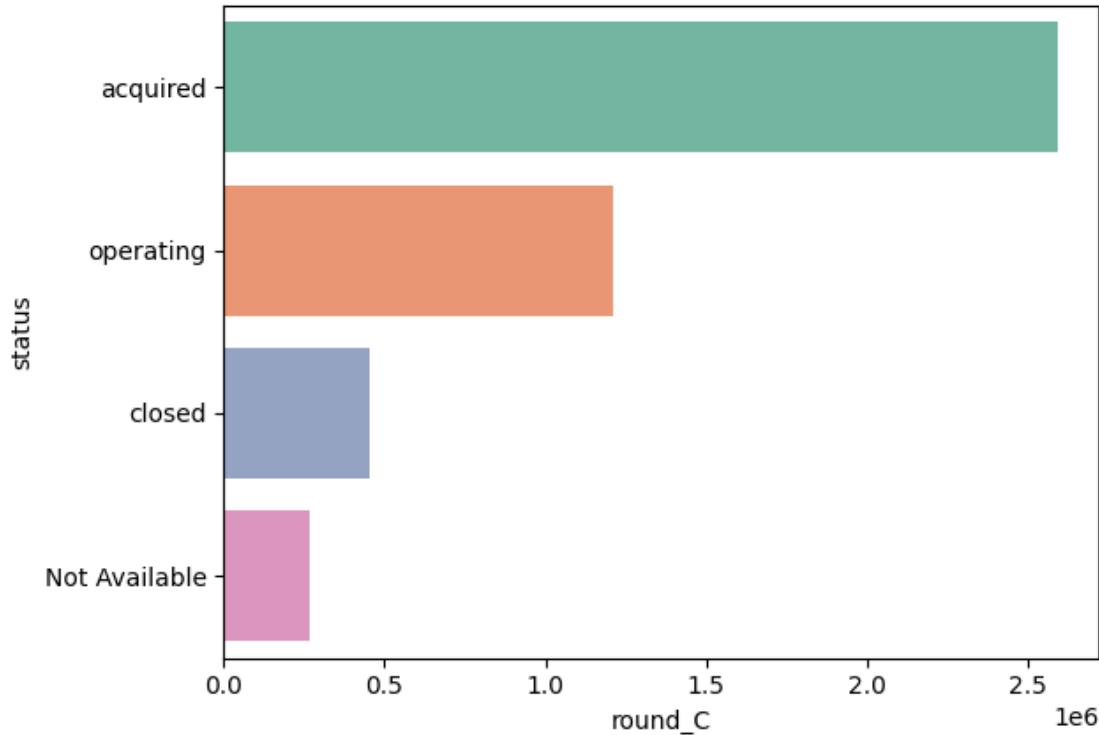
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'sum'}).reset_index().  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_C', ylabel='status'>
```



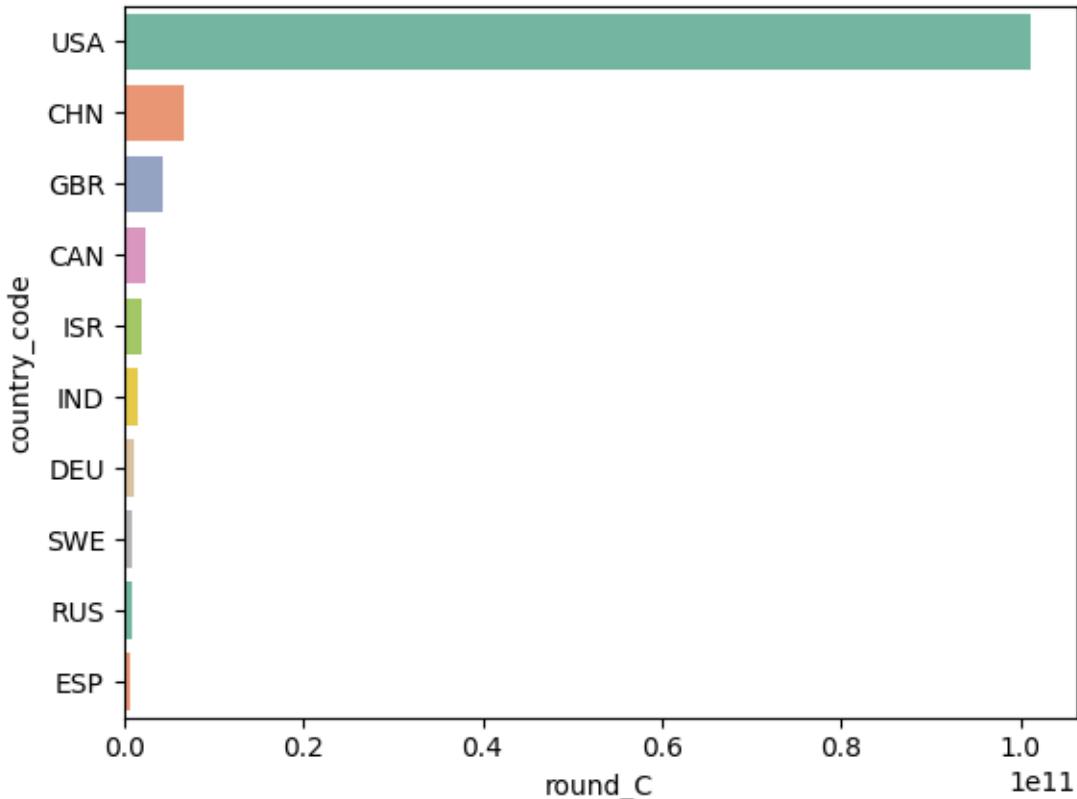
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'mean'}).reset_index()
      .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_C', ylabel='status'>
```



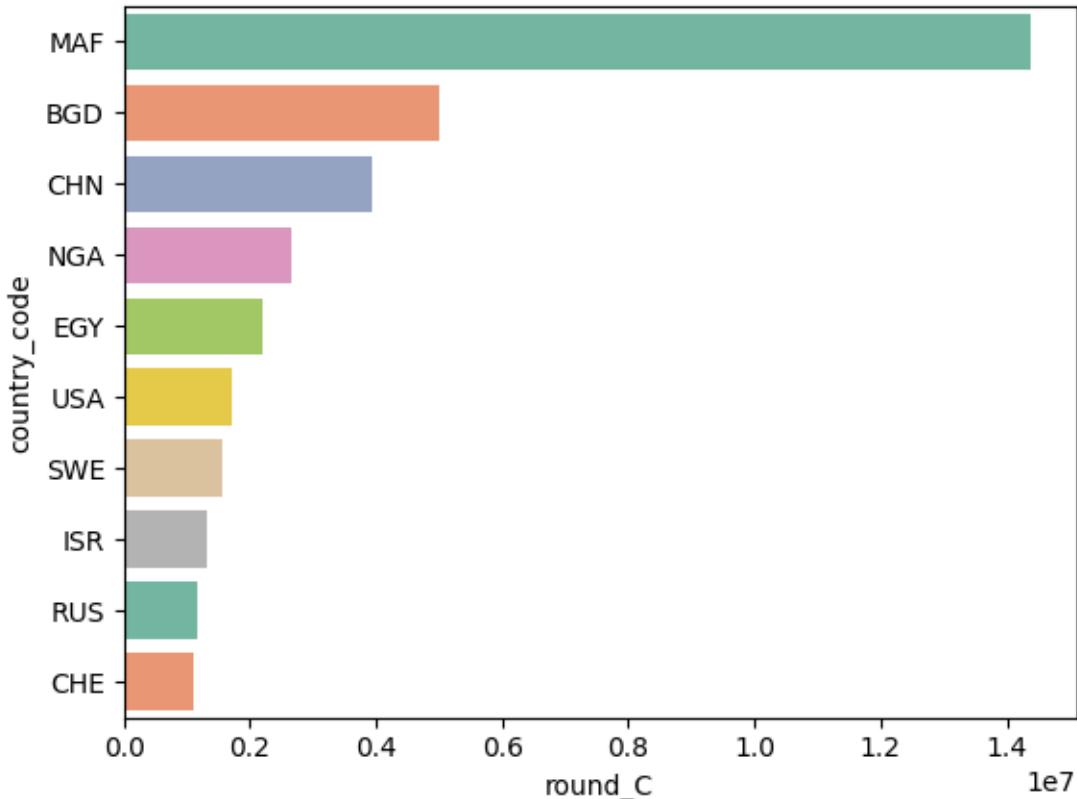
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'sum'}).reset_index().  
     .sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_C', ylabel='country_code'>
```



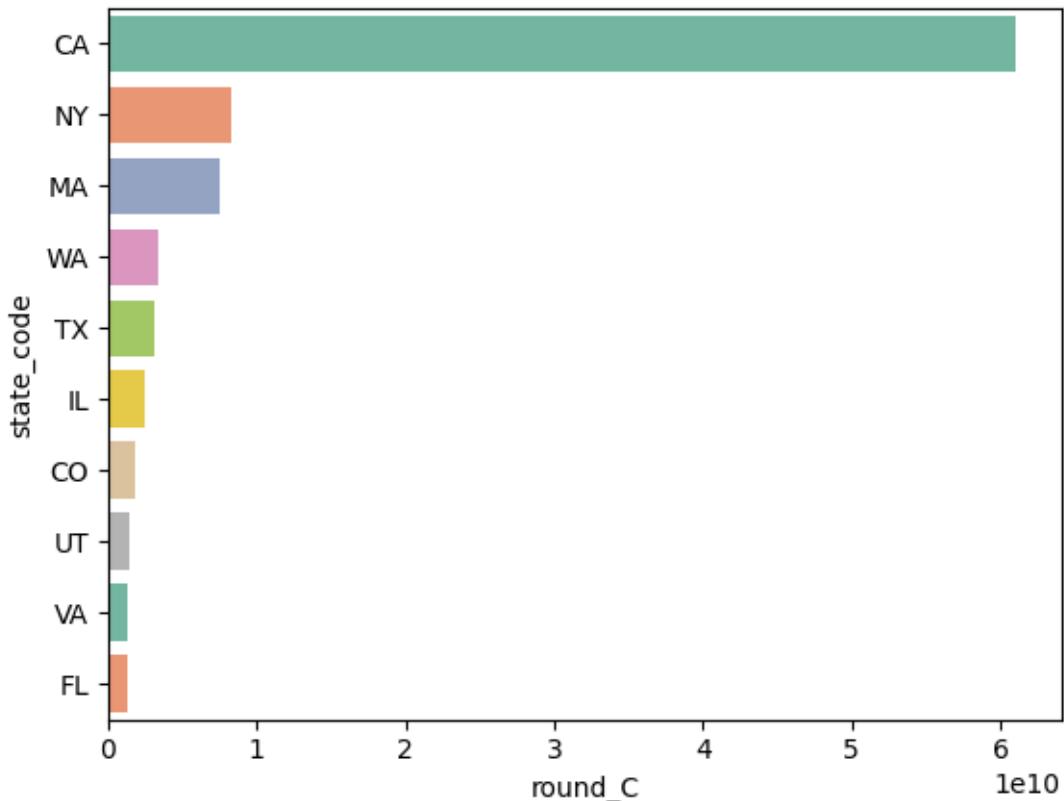
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_C', ylabel='country_code'>
```



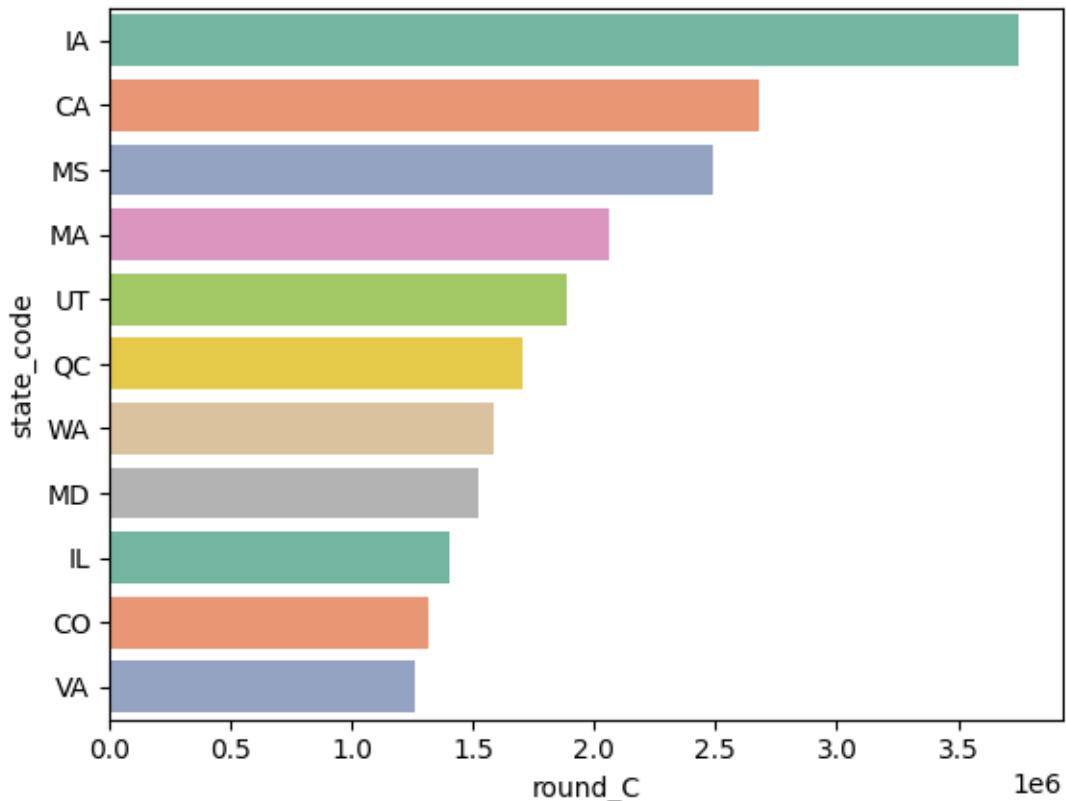
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'sum'}).reset_index().  
     ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_C', ylabel='state_code'>
```



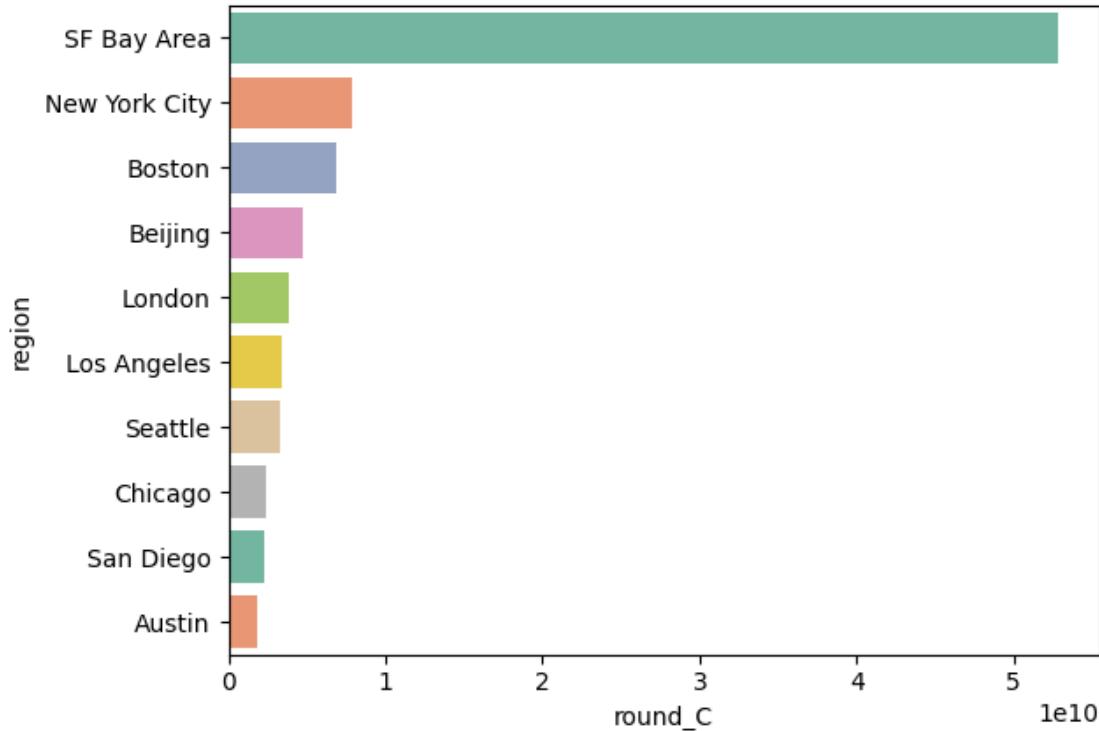
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_C', ylabel='state_code'>
```



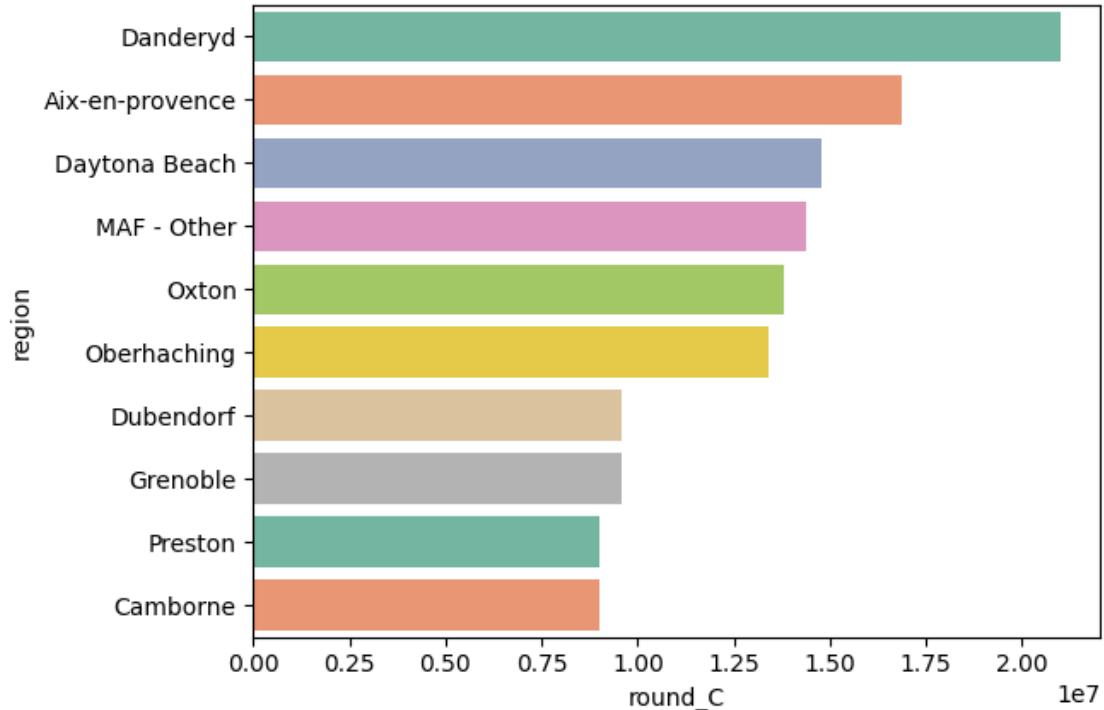
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_C', ylabel='region'>
```



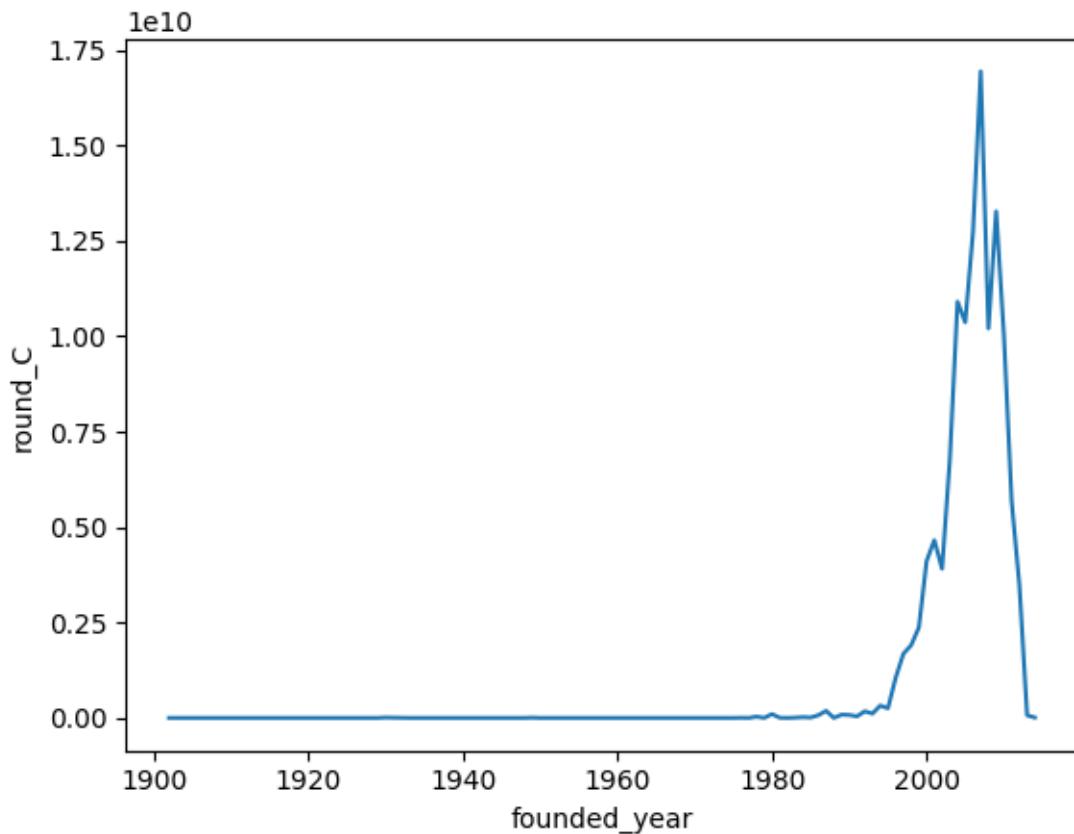
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'mean'}).reset_index()
     ↪sort_values(column, ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_C', ylabel='region'>
```



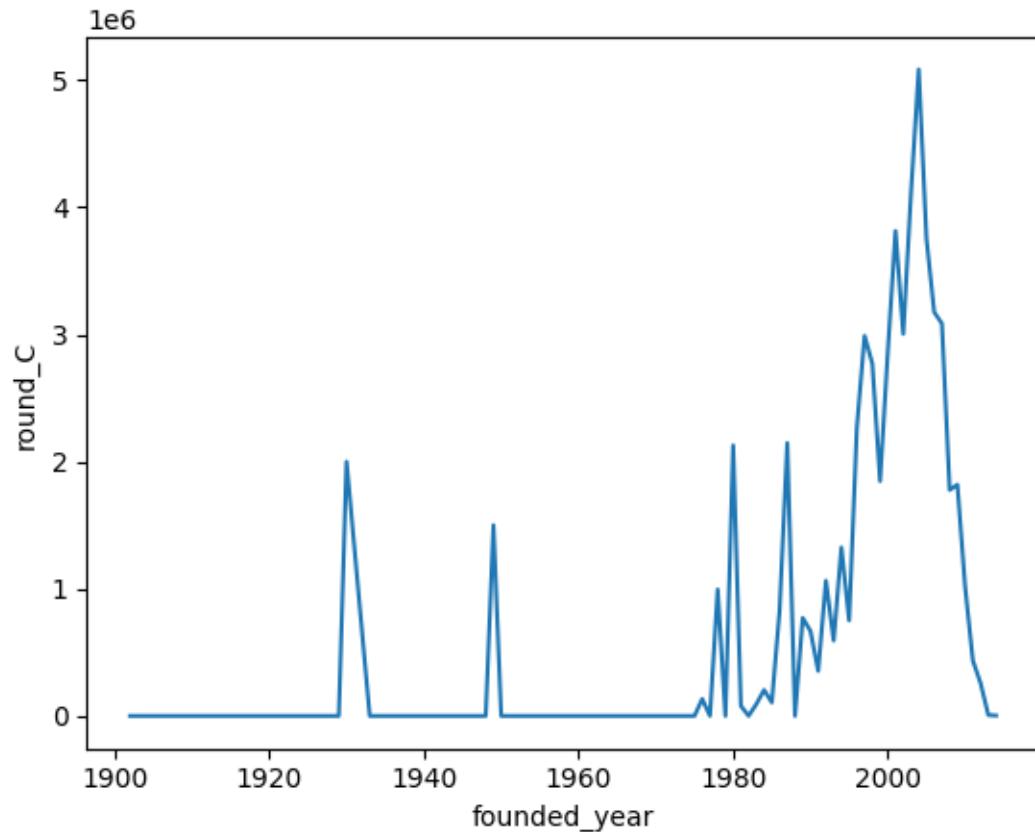
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'sum'}).reset_index().  
      ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='round_C'>
```



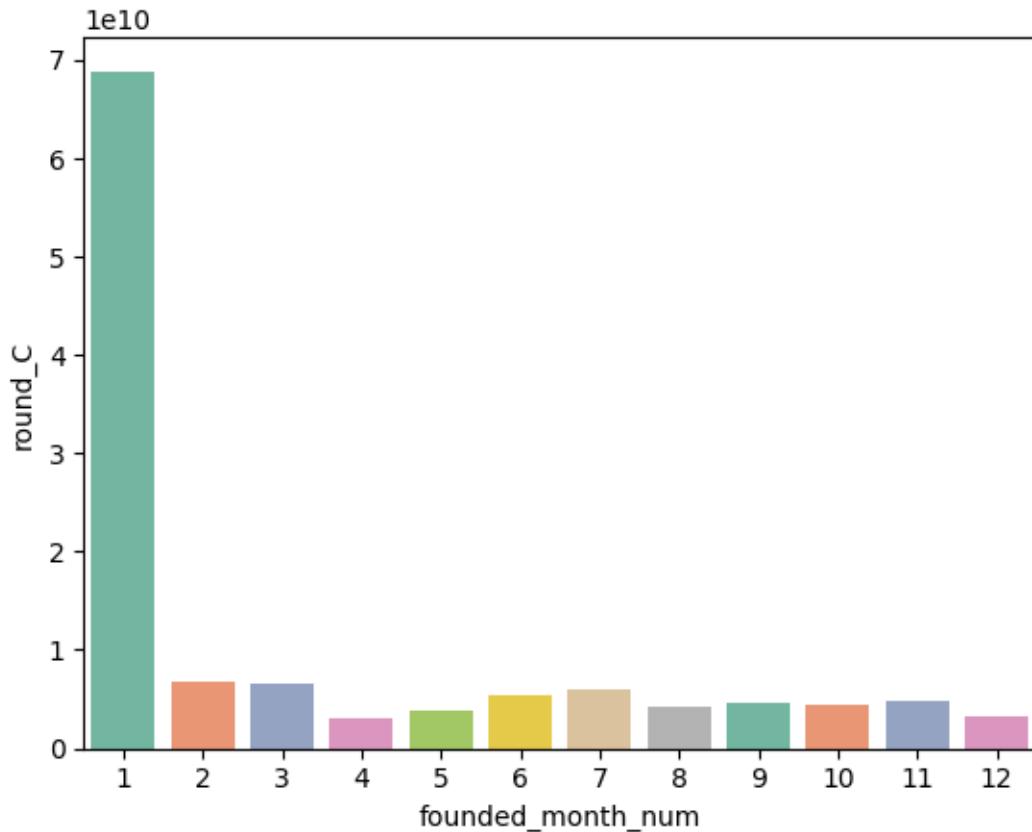
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'mean'}).reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='round_C'>
```



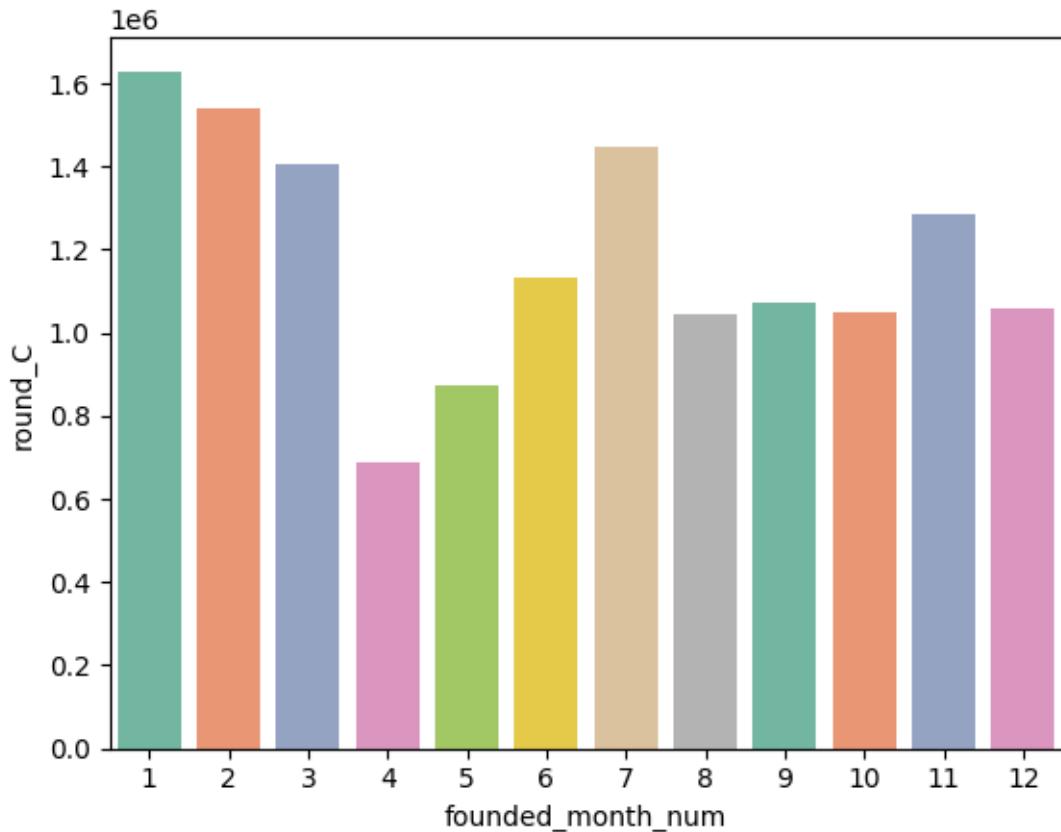
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'sum'}).
    ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='round_C'>
```



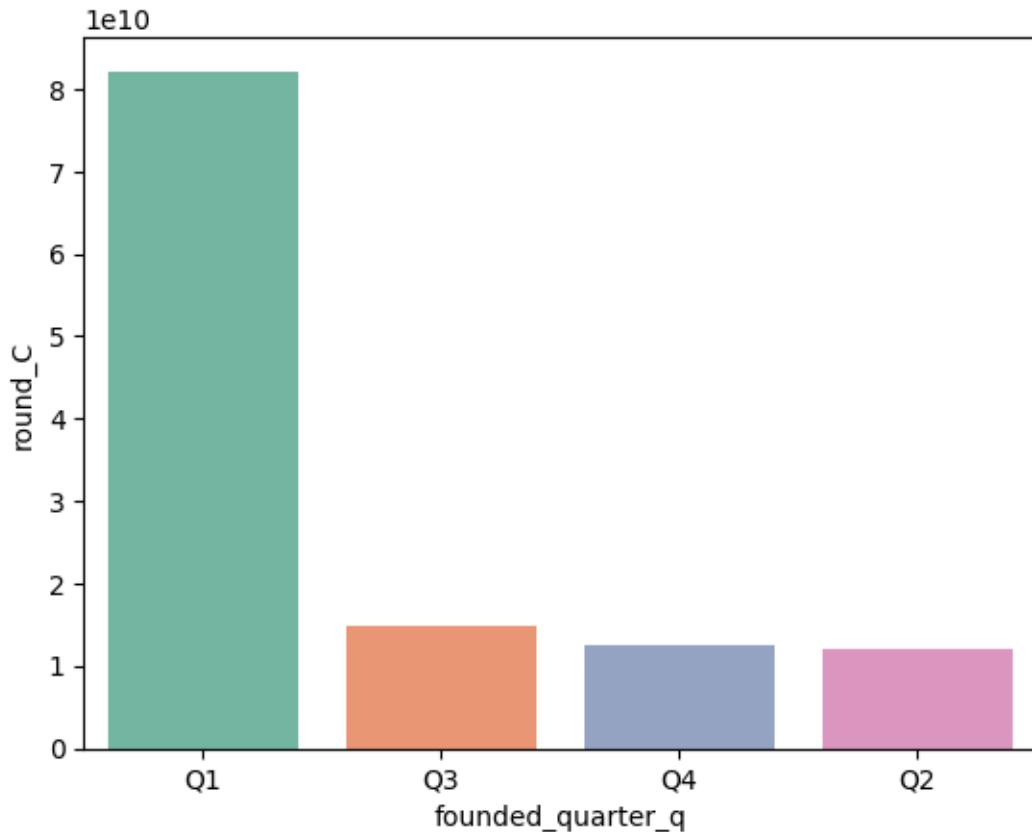
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='round_C'>
```



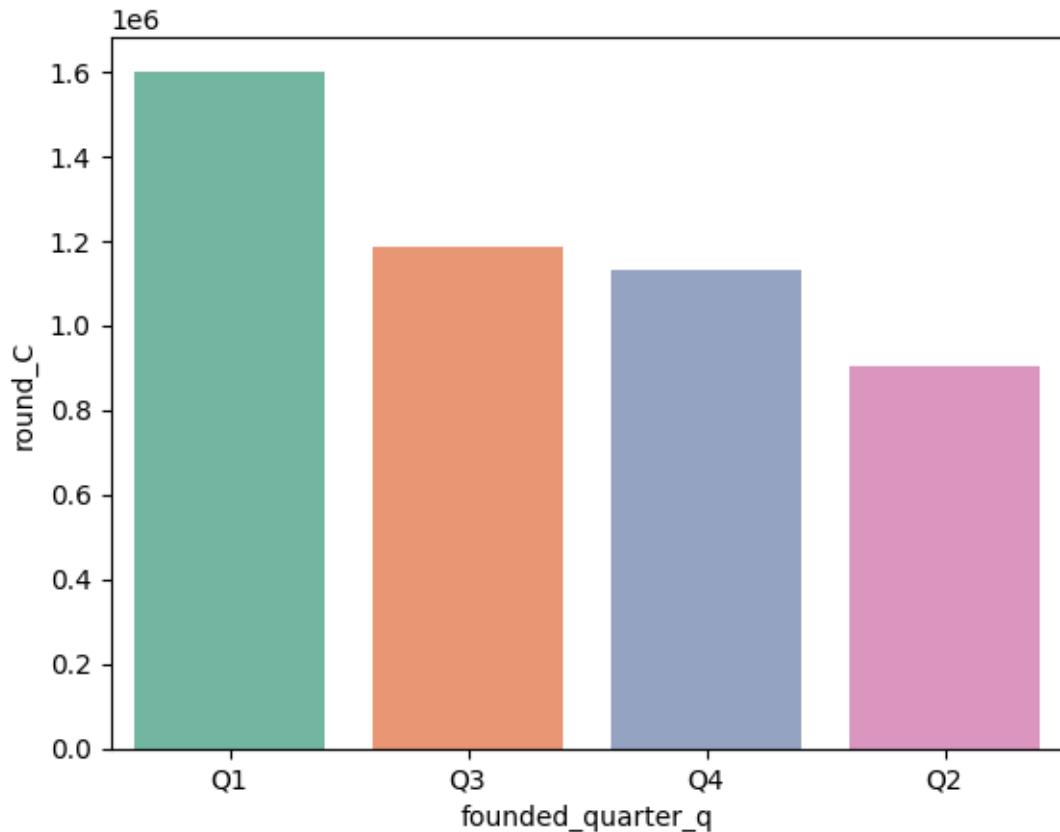
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'sum'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q']!= 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='round_C'>
```



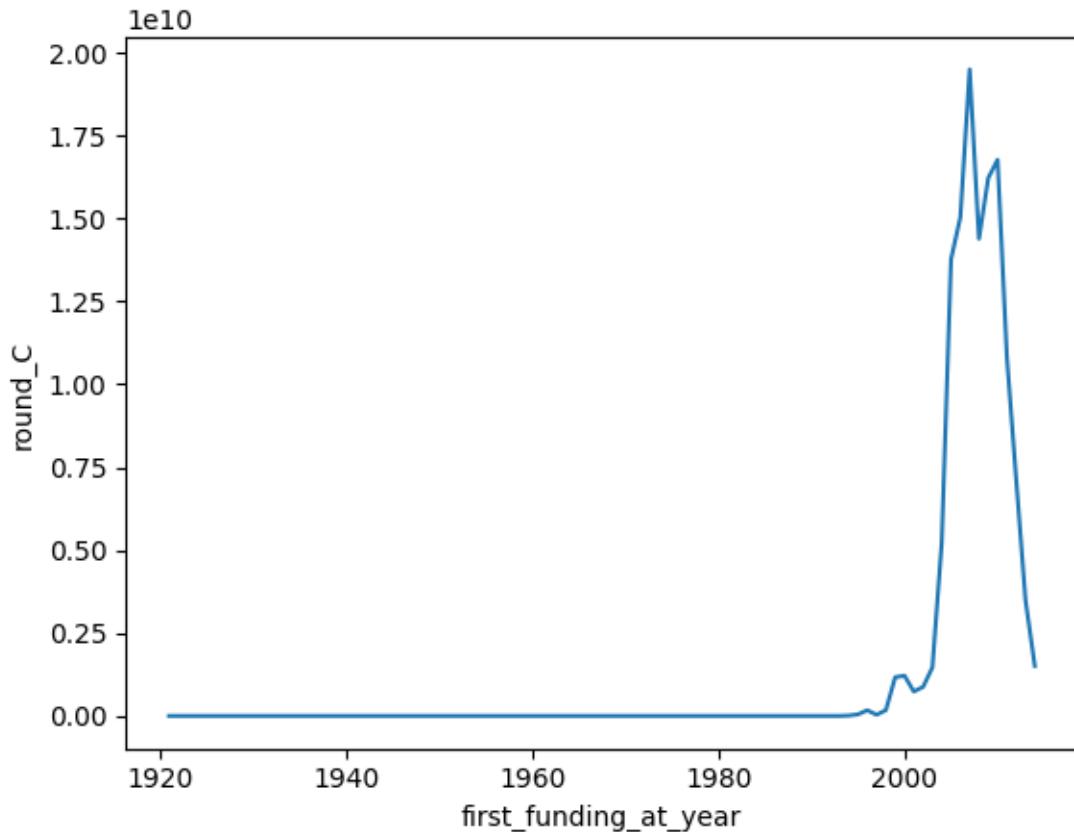
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='round_C'>
```



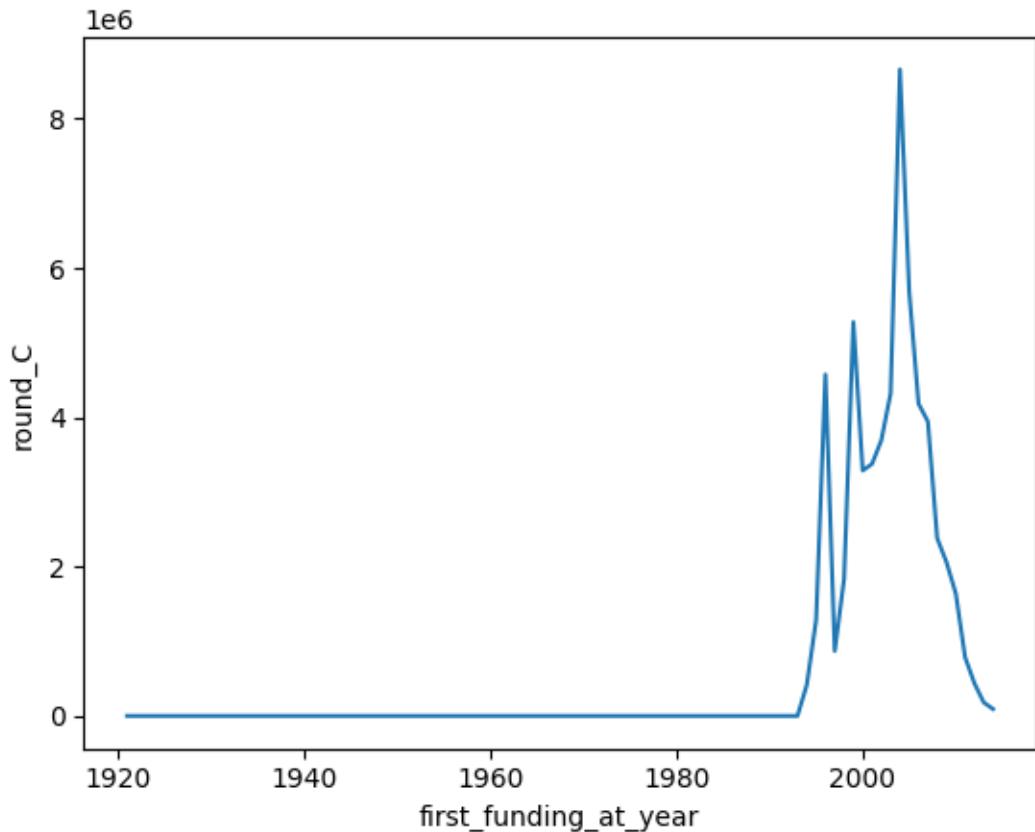
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='round_C'>
```



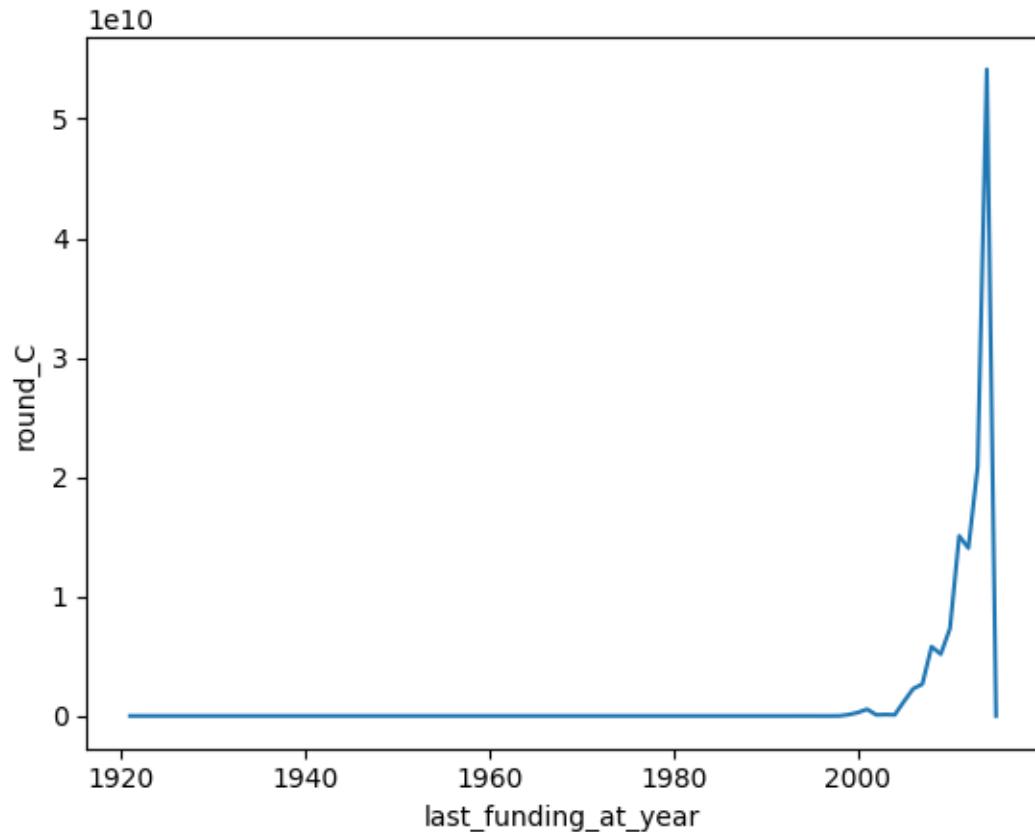
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='round_C'>
```



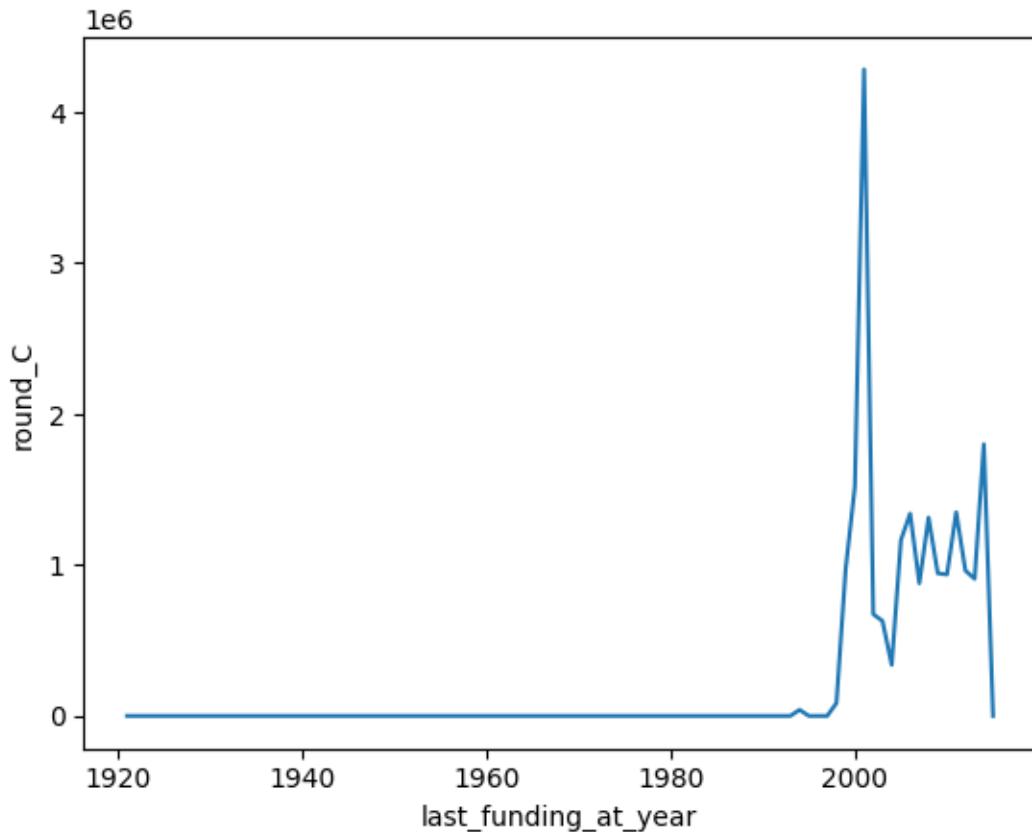
```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='round_C'>
```



```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

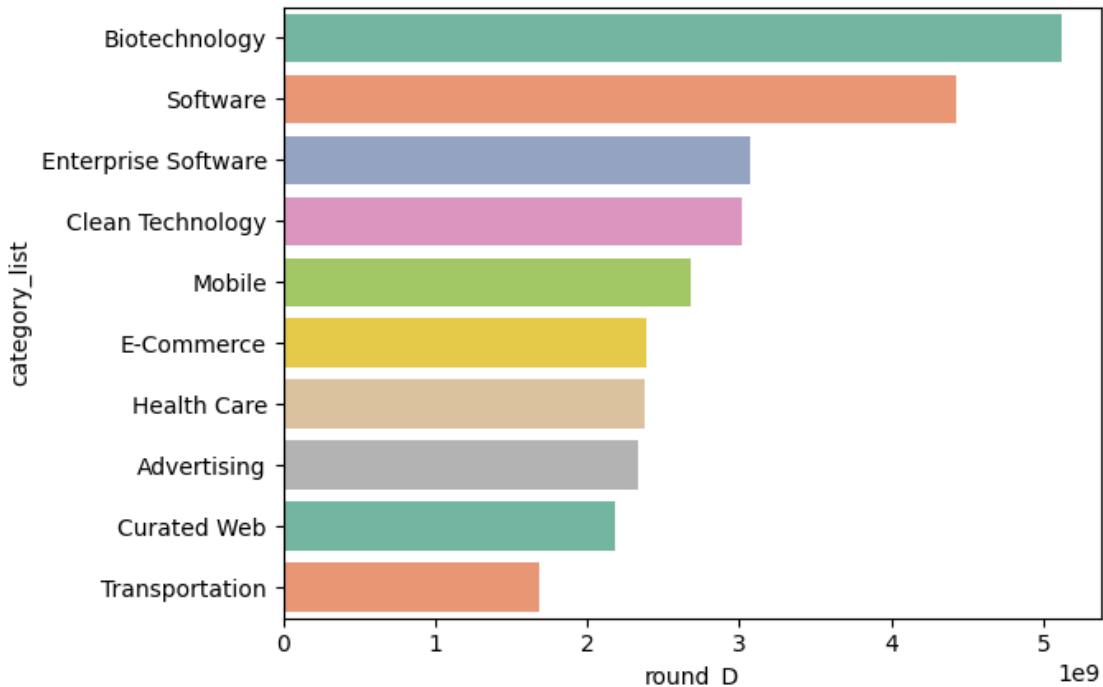
```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='round_C'>
```



## 1.21 Round\_D

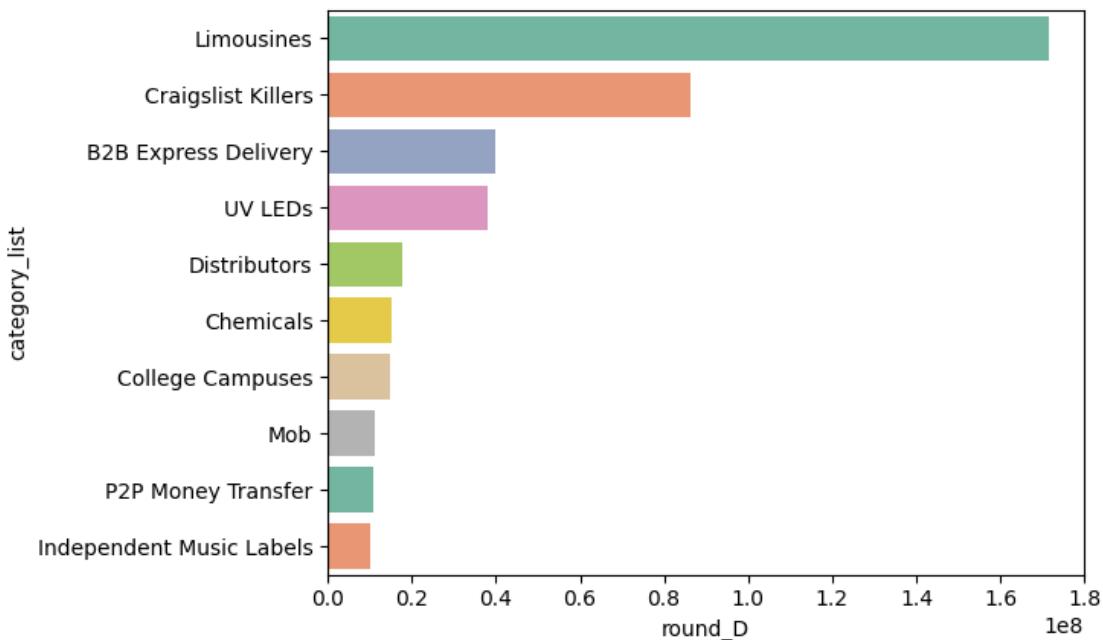
Average and Total Analysis of the Round D Funds as shown below.

```
[ ]: column = 'round_D'  
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'sum'}).reset_index().  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')  
[ ]: <Axes: xlabel='round_D', ylabel='category_list'>
```



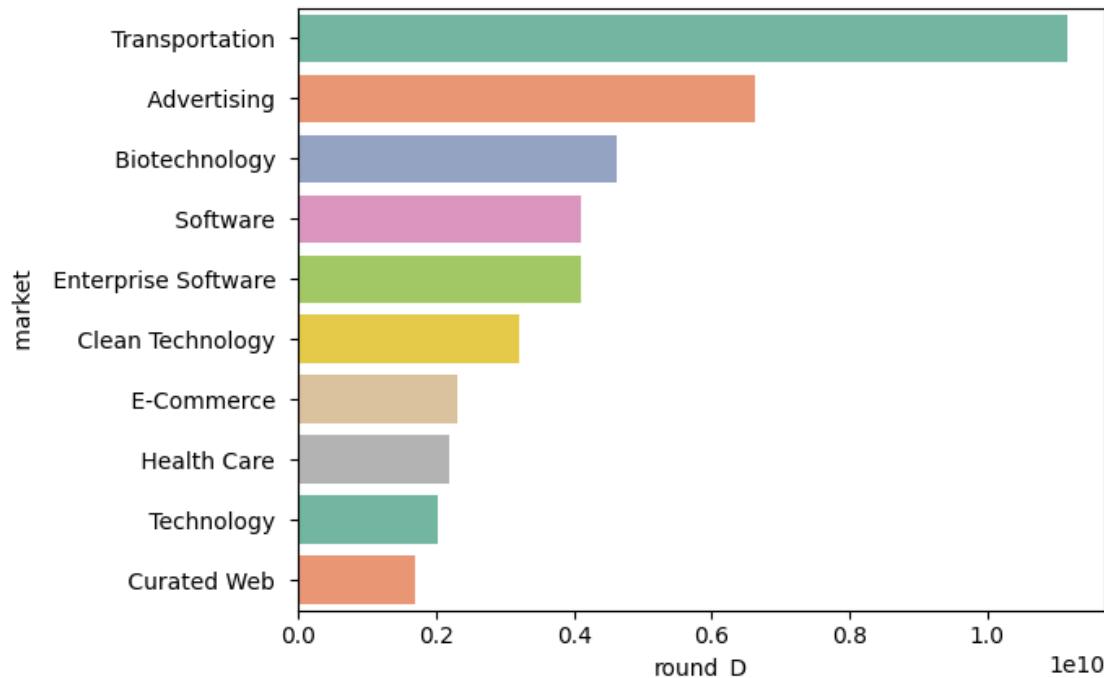
```
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'mean'}).reset_index() .
    ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_D', ylabel='category_list'>
```



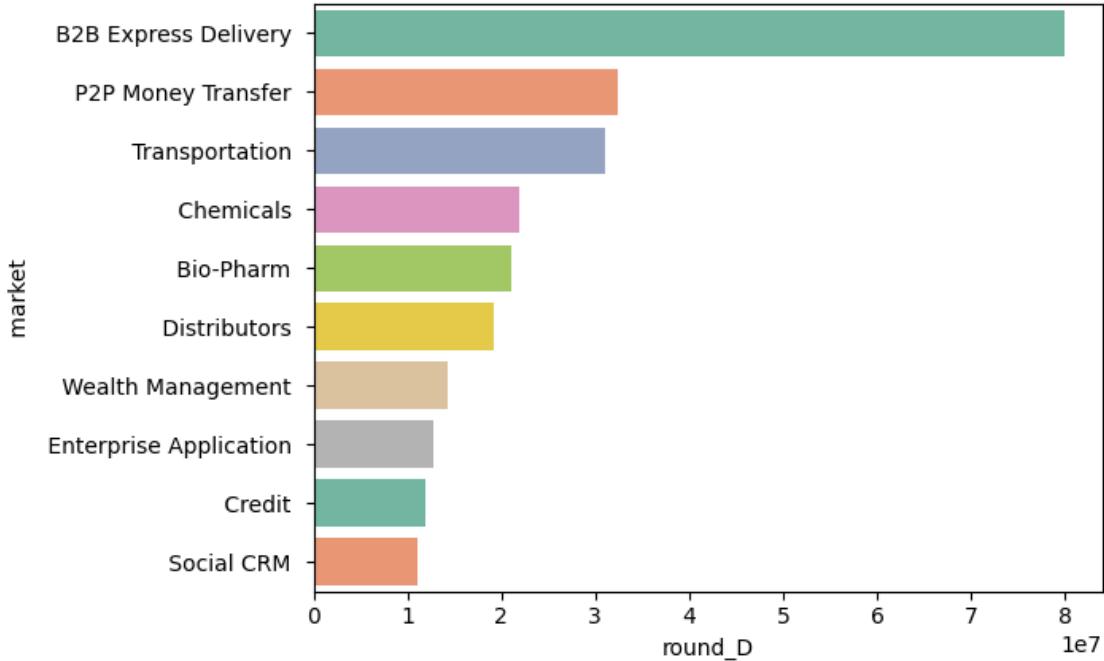
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'sum'}).reset_index() .  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='round_D', ylabel=' market '>
```



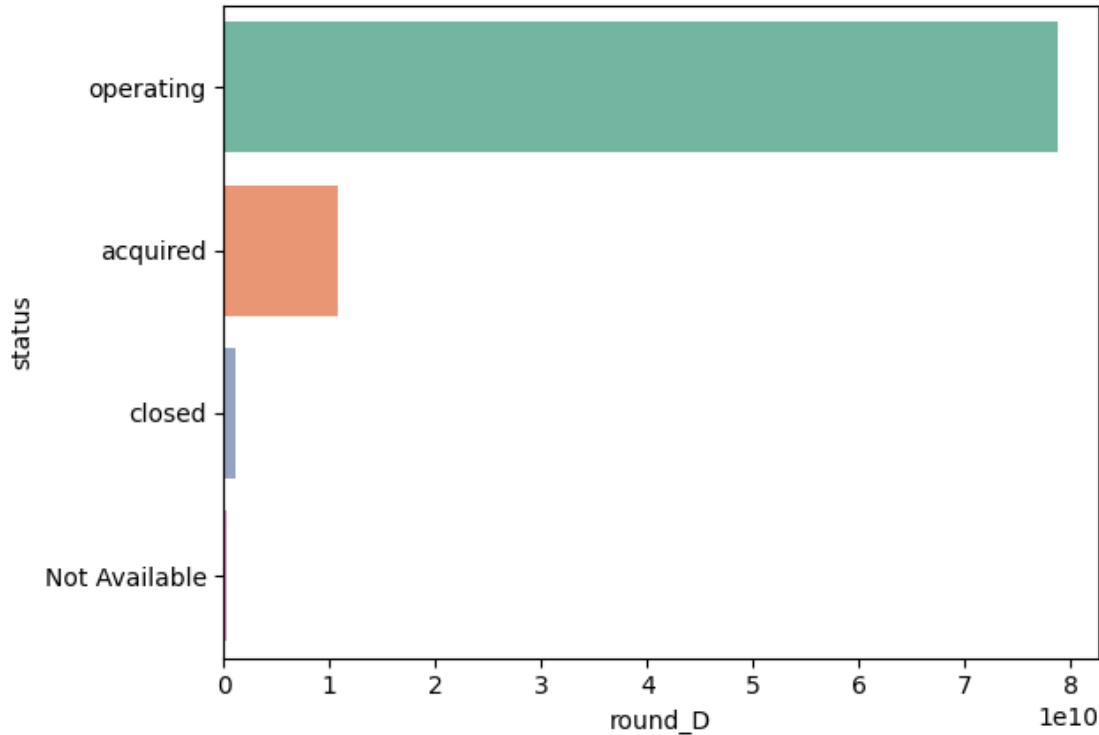
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='round_D', ylabel=' market '>
```



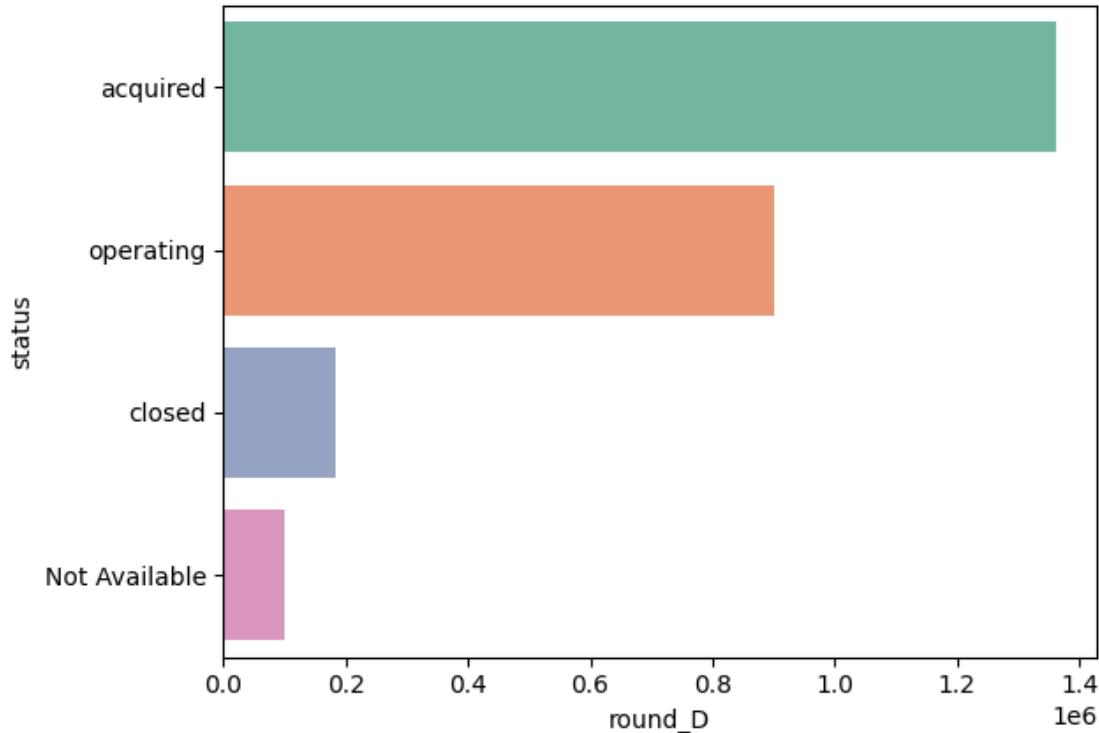
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'sum'}).reset_index().  
     .sort_values(column, ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_D', ylabel='status'>
```



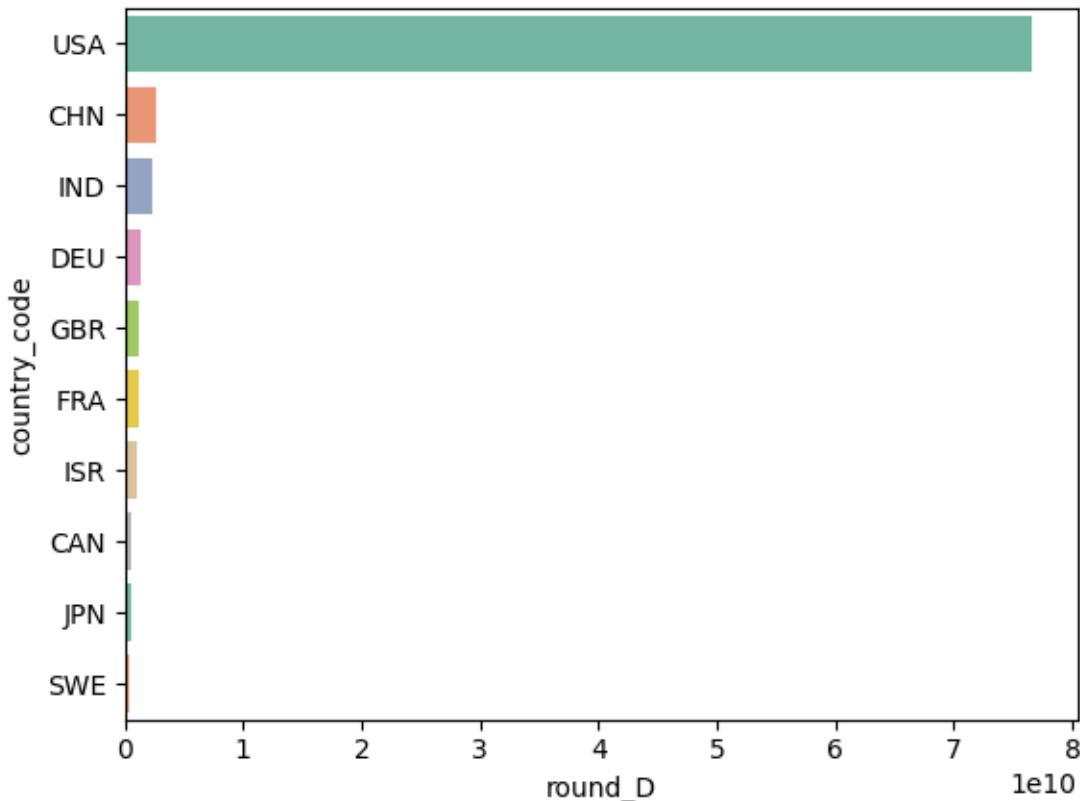
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'mean'}).reset_index()
      .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_D', ylabel='status'>
```



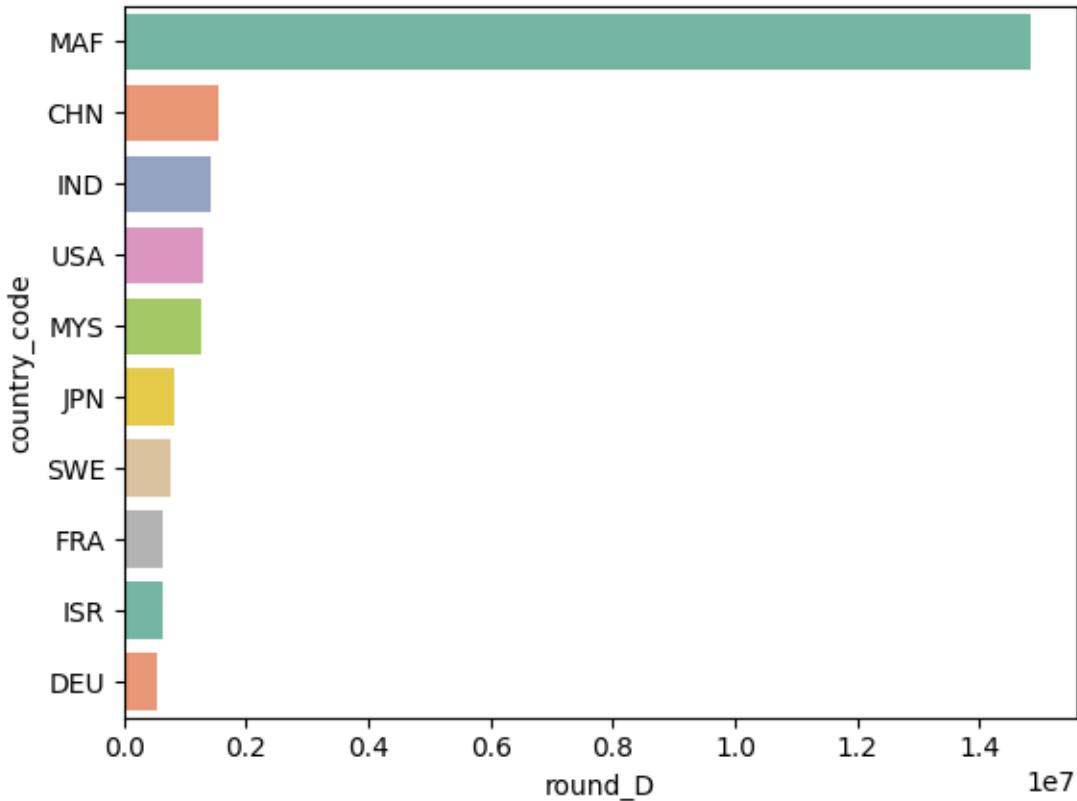
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'sum'}).reset_index().  
    .sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_D', ylabel='country_code'>
```



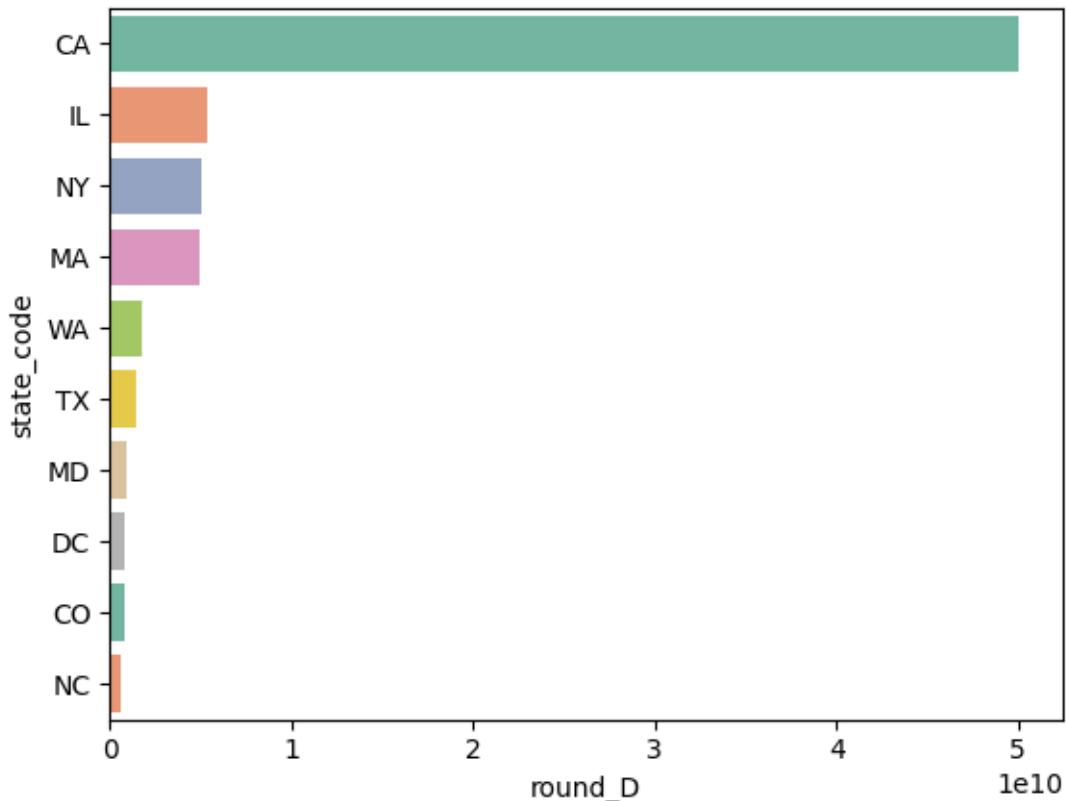
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_D', ylabel='country_code'>
```



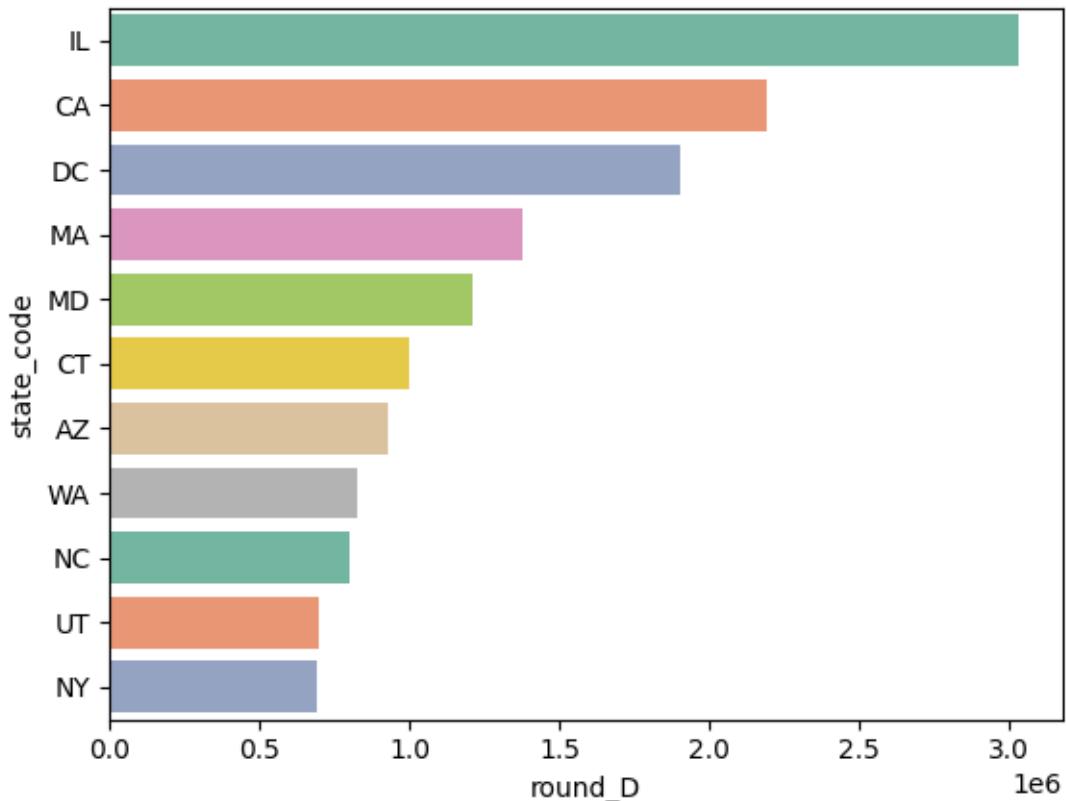
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'sum'}).reset_index()
      ↪sort_values(column,ascending=False).head(11)
df_plot = df_plot[df_plot['state_code']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['state_code'],palette='Set2')
```

```
[ ]: <Axes: xlabel='round_D', ylabel='state_code'>
```



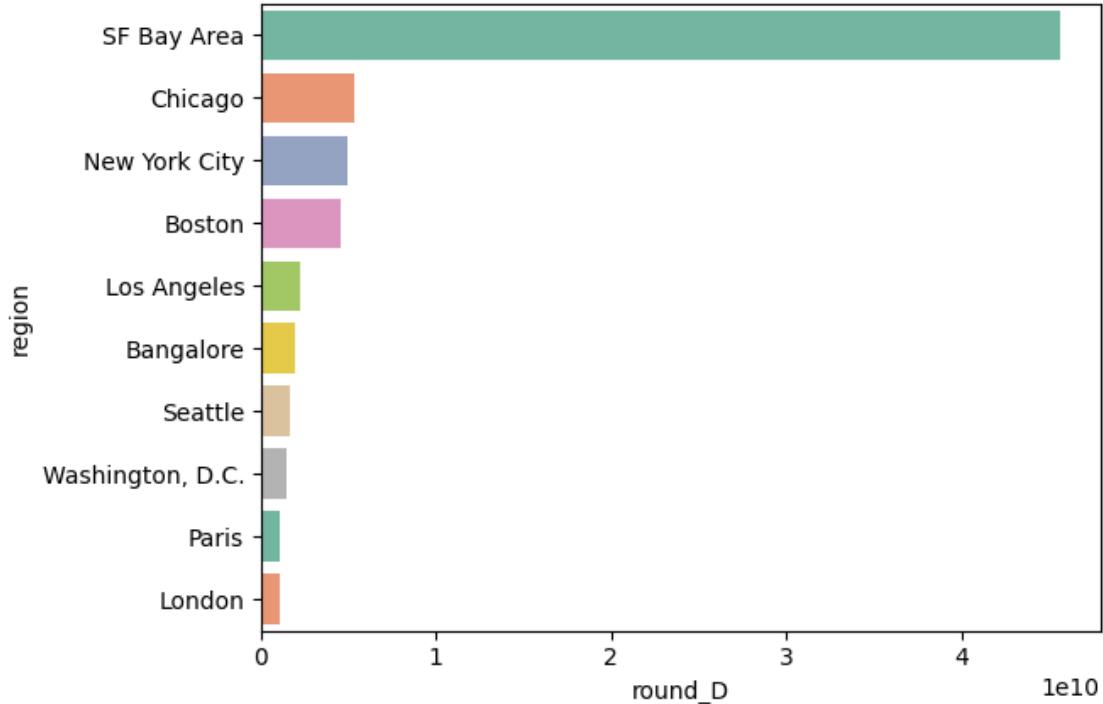
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_D', ylabel='state_code'>
```



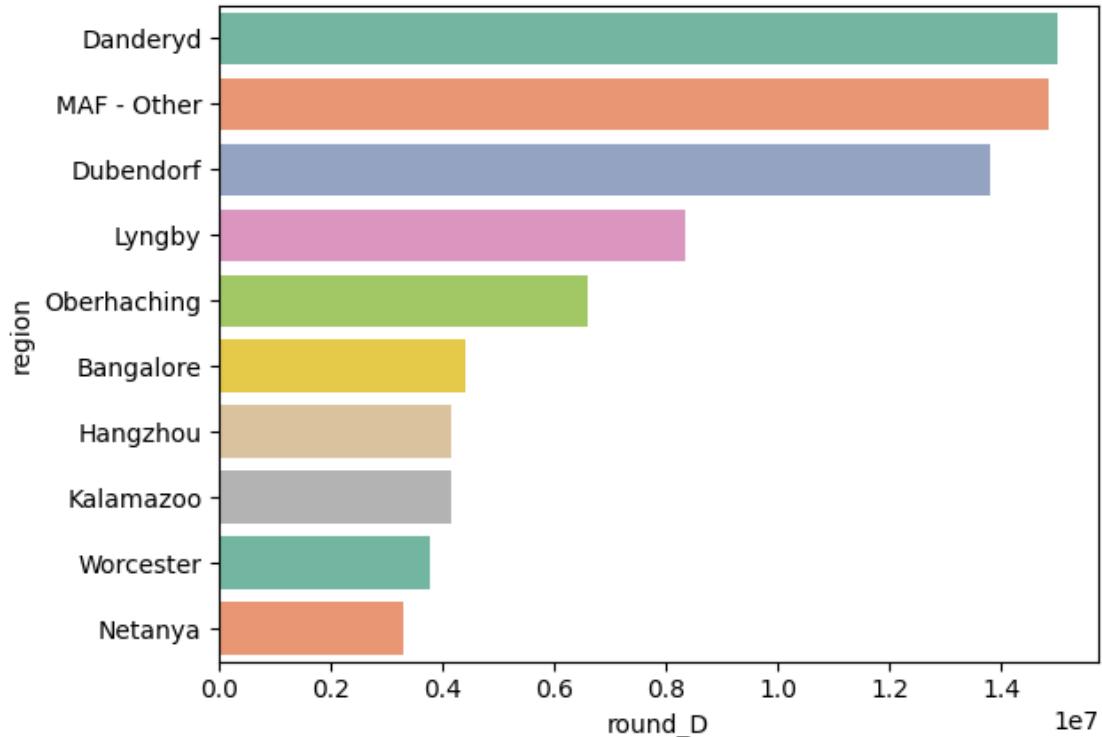
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_D', ylabel='region'>
```



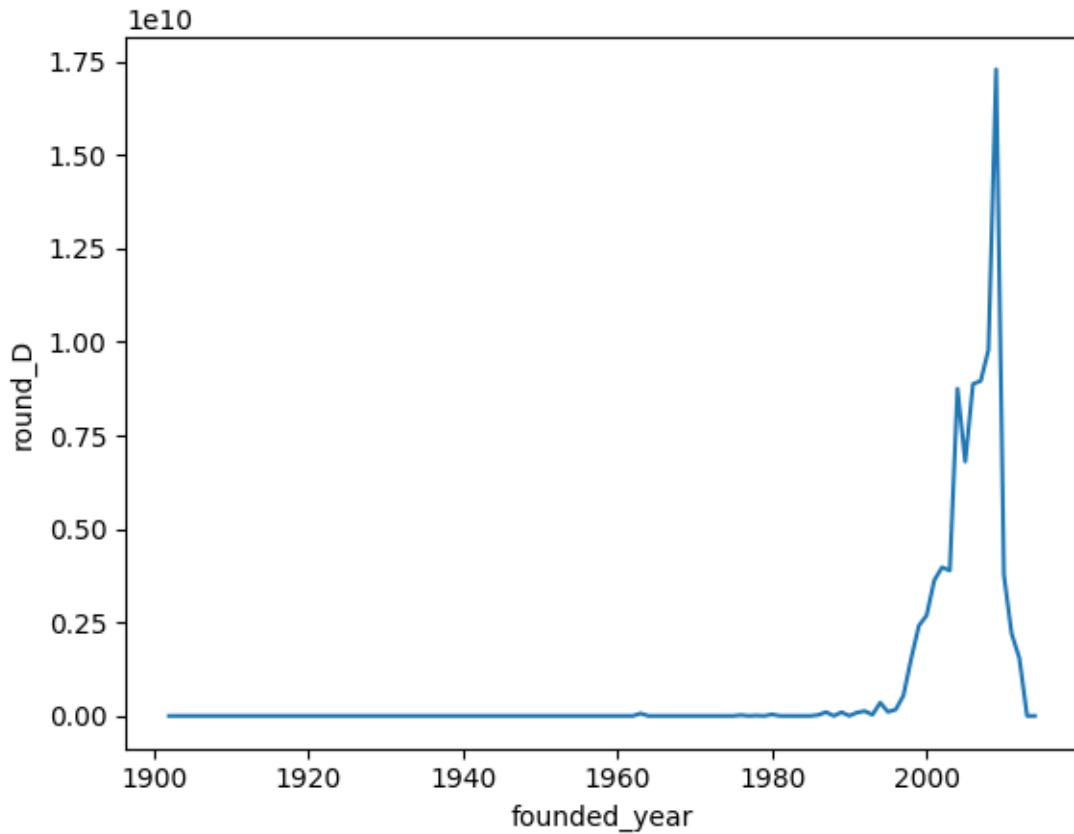
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'mean'}).reset_index()
      ↪sort_values(column, ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_D', ylabel='region'>
```



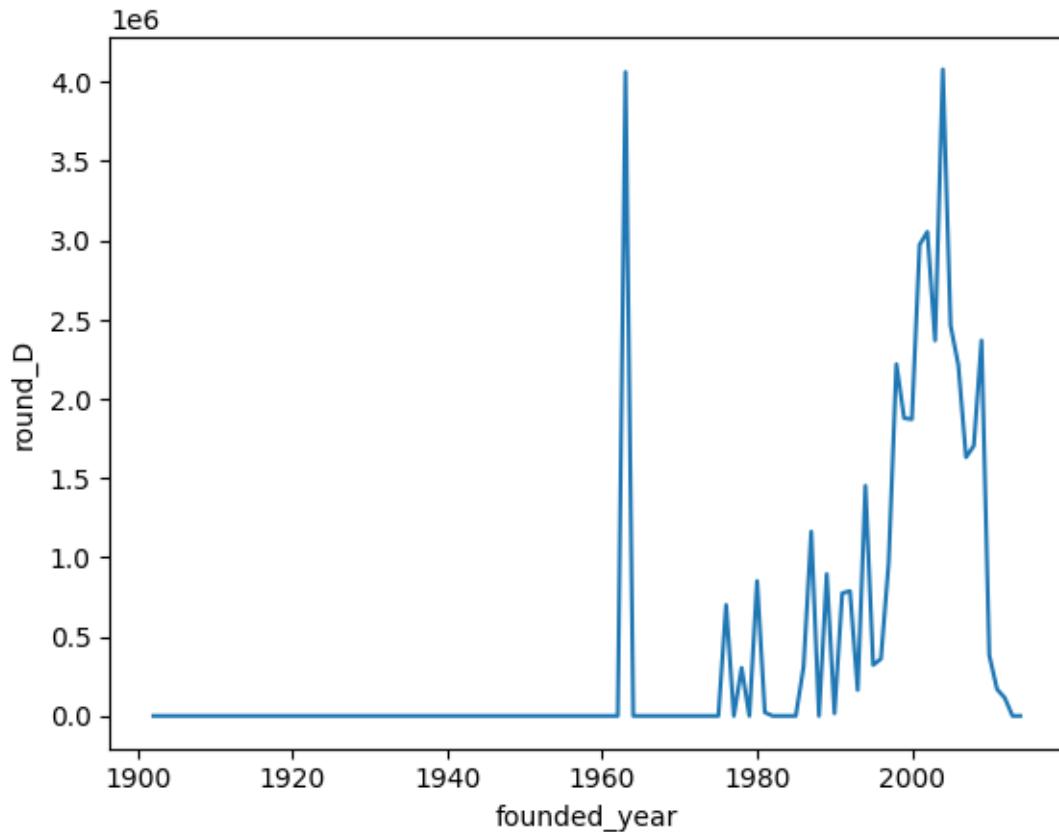
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'sum'}).reset_index().  
    ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='round_D'>
```



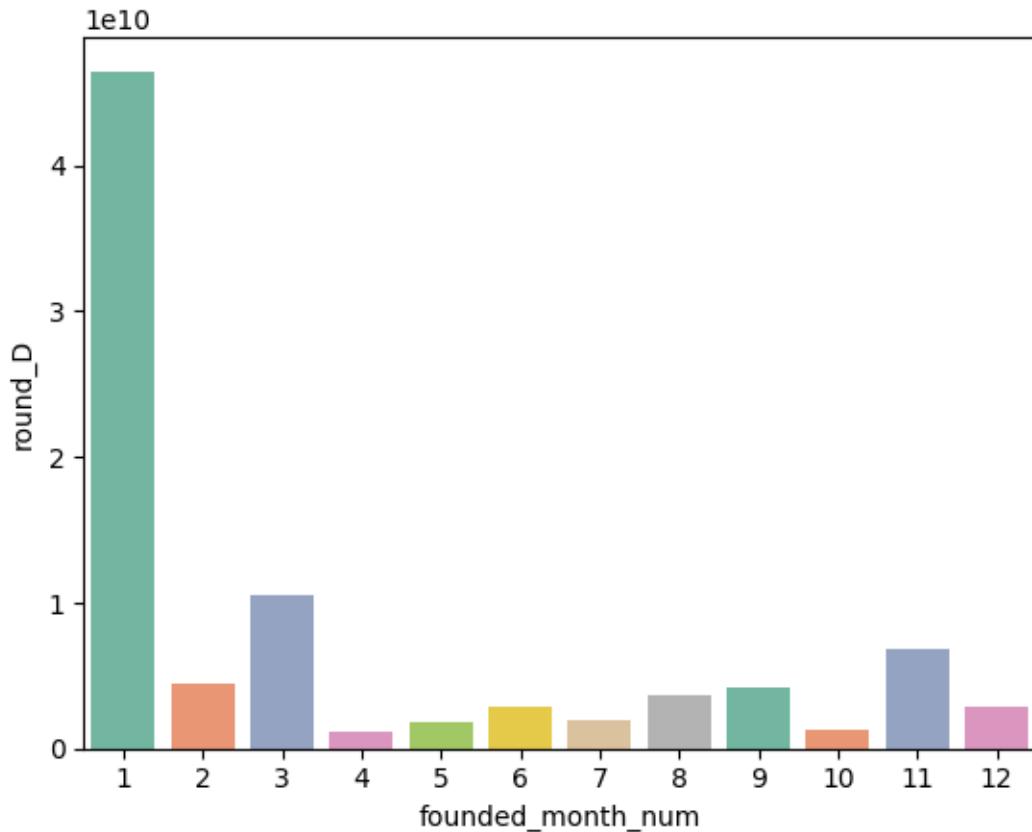
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'mean'}).reset_index().  
      ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='round_D'>
```



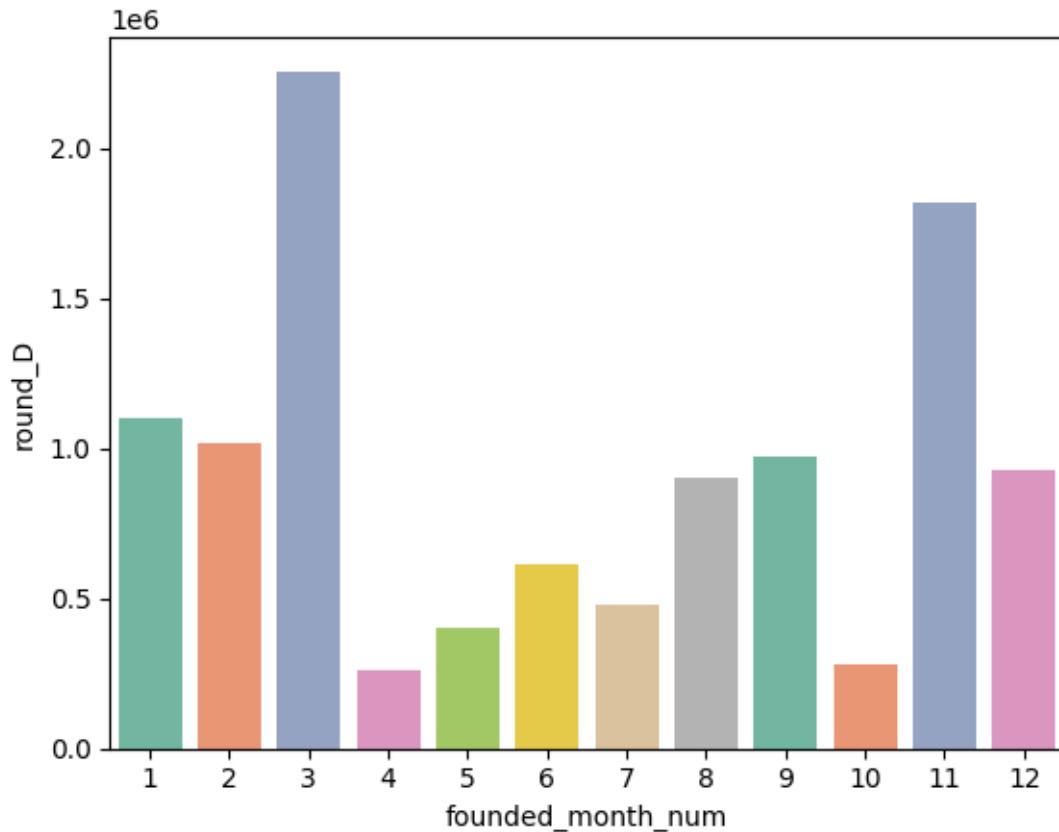
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_month_num'] > 0]  
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='round_D'>
```



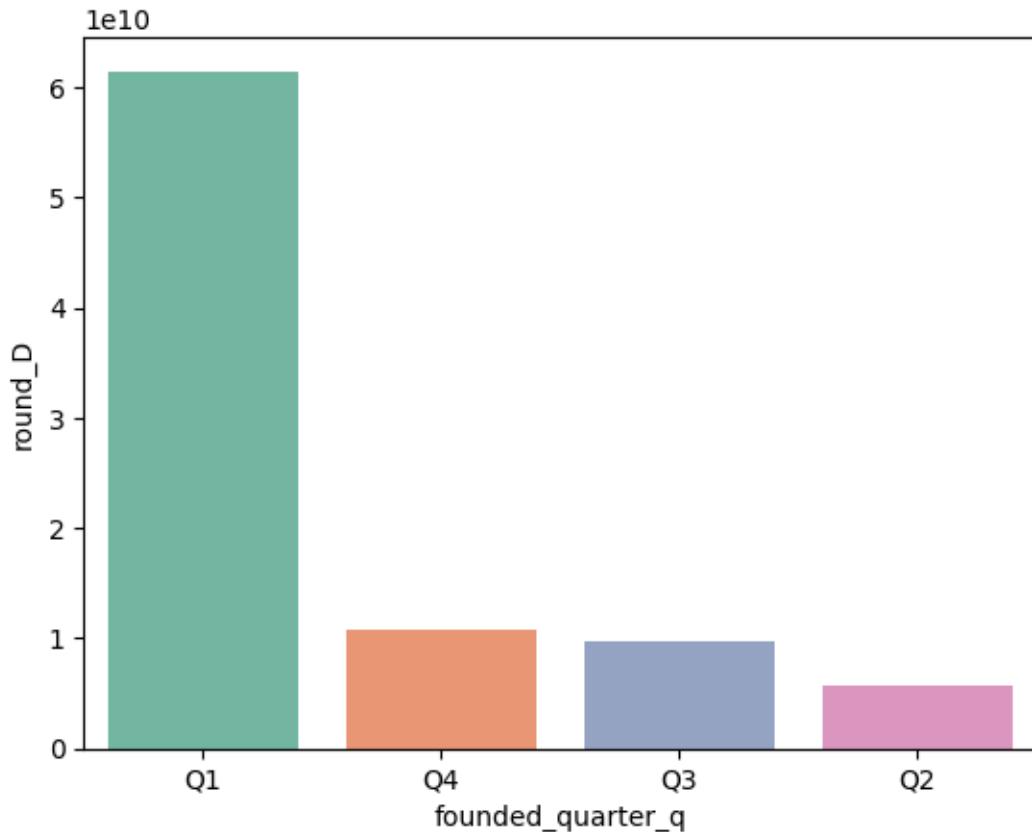
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='round_D'>
```



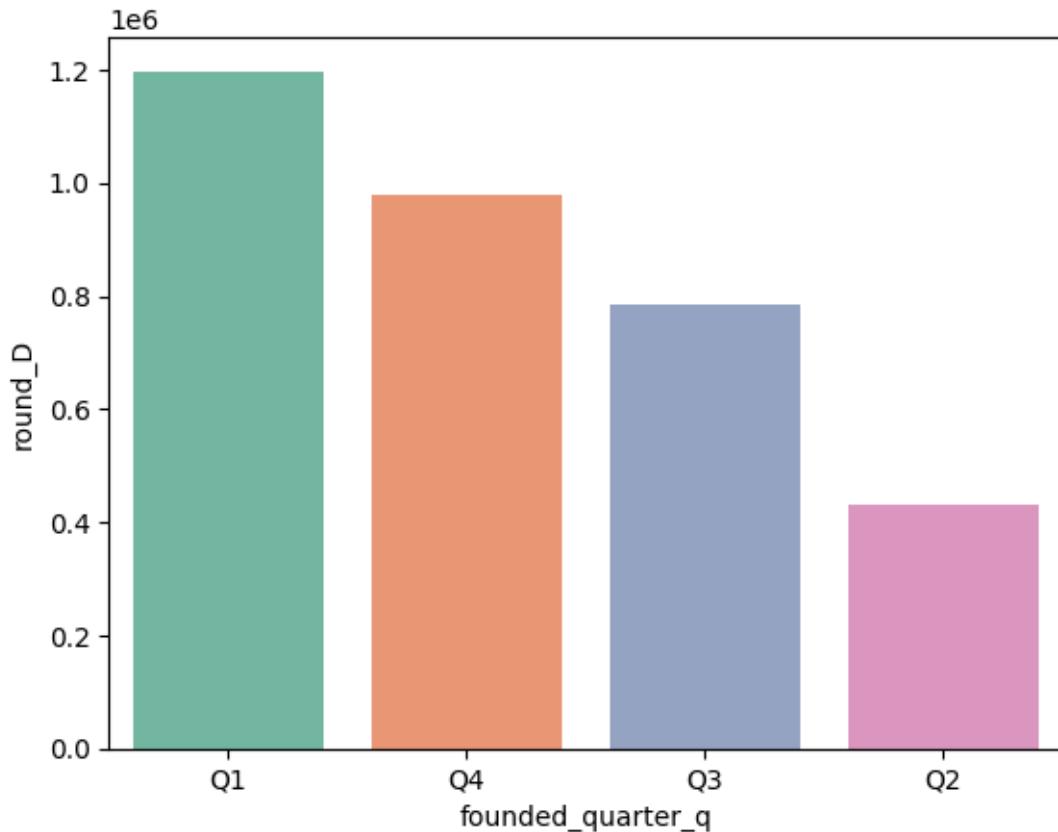
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'sum'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='round_D'>
```



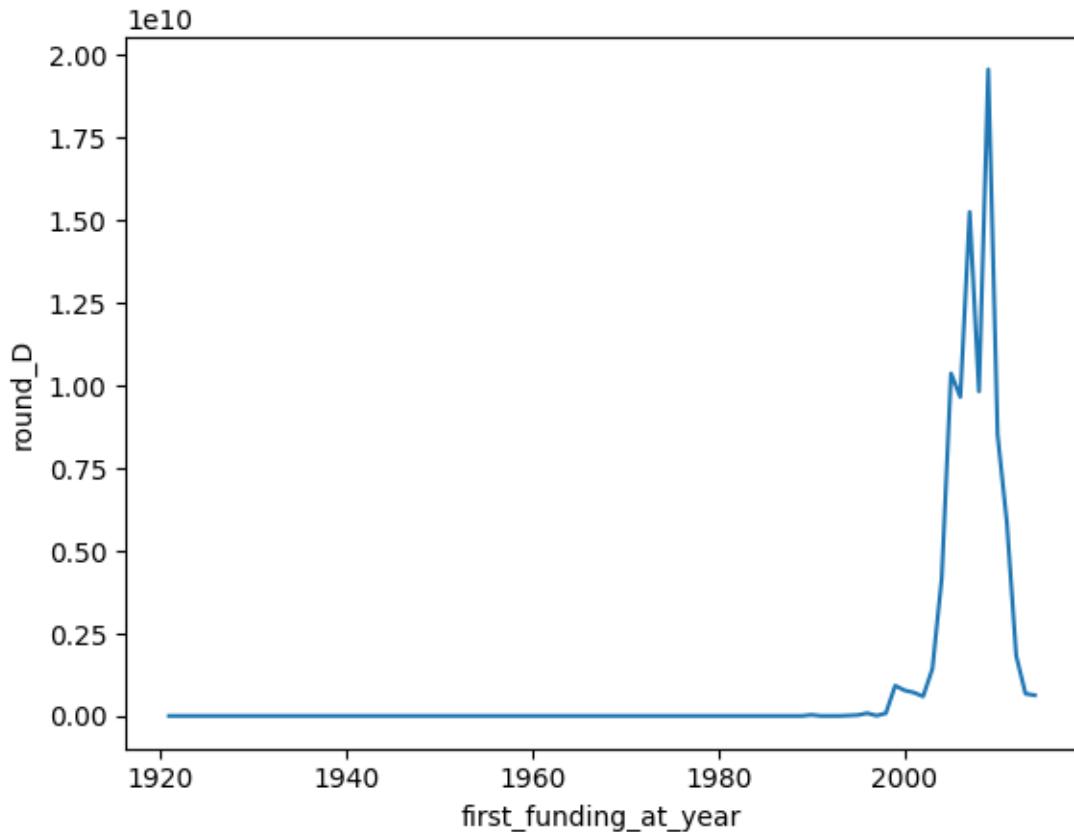
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='round_D'>
```



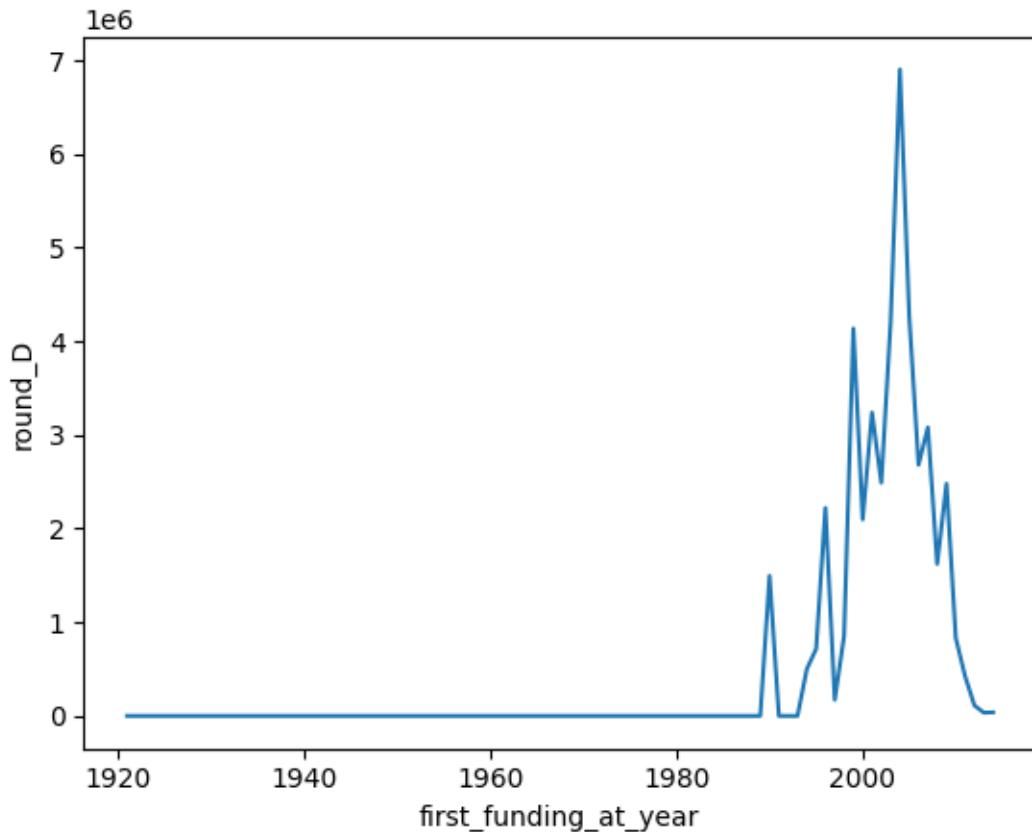
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='round_D'>
```



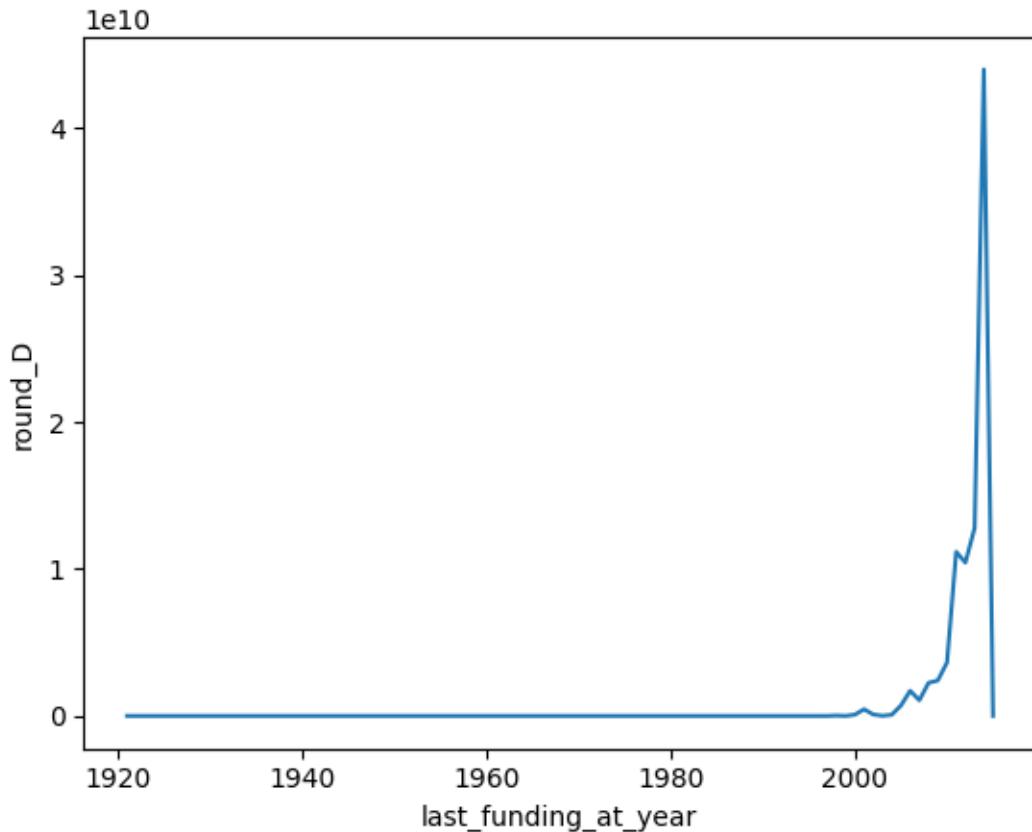
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='round_D'>
```



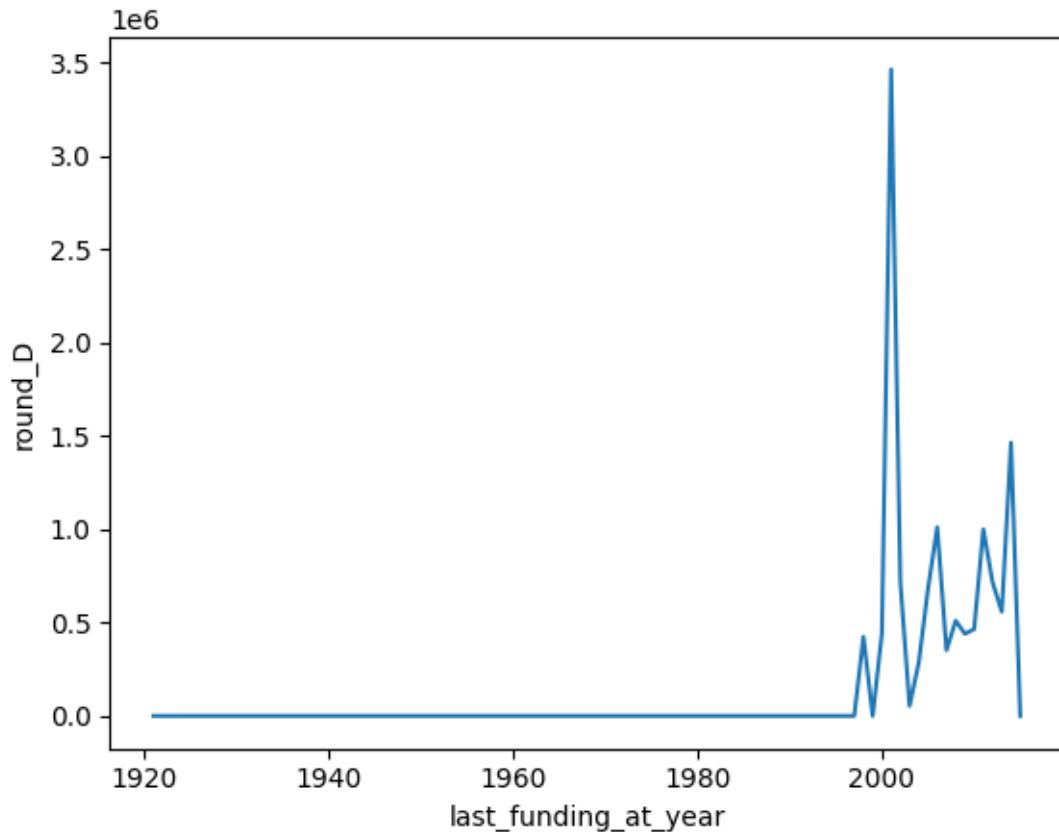
```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='round_D'>
```



```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='round_D'>
```



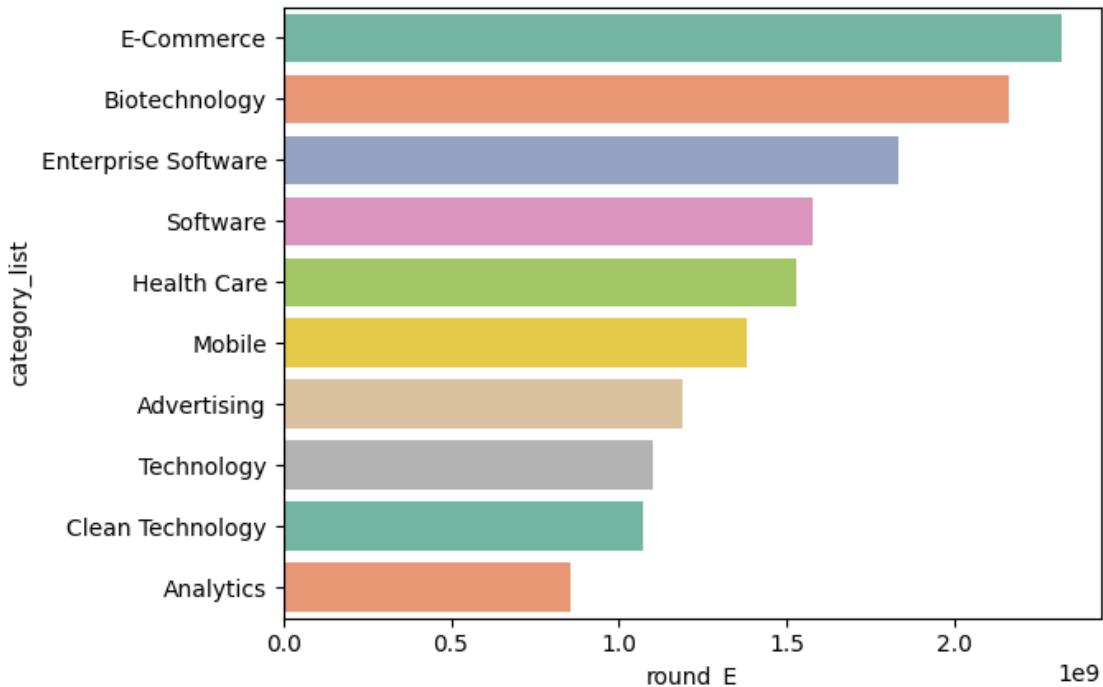
## 1.22 Round\_E

Average and Total Analysis of the Round E Funds as shown below.

```
[ ]: column = 'round_E'

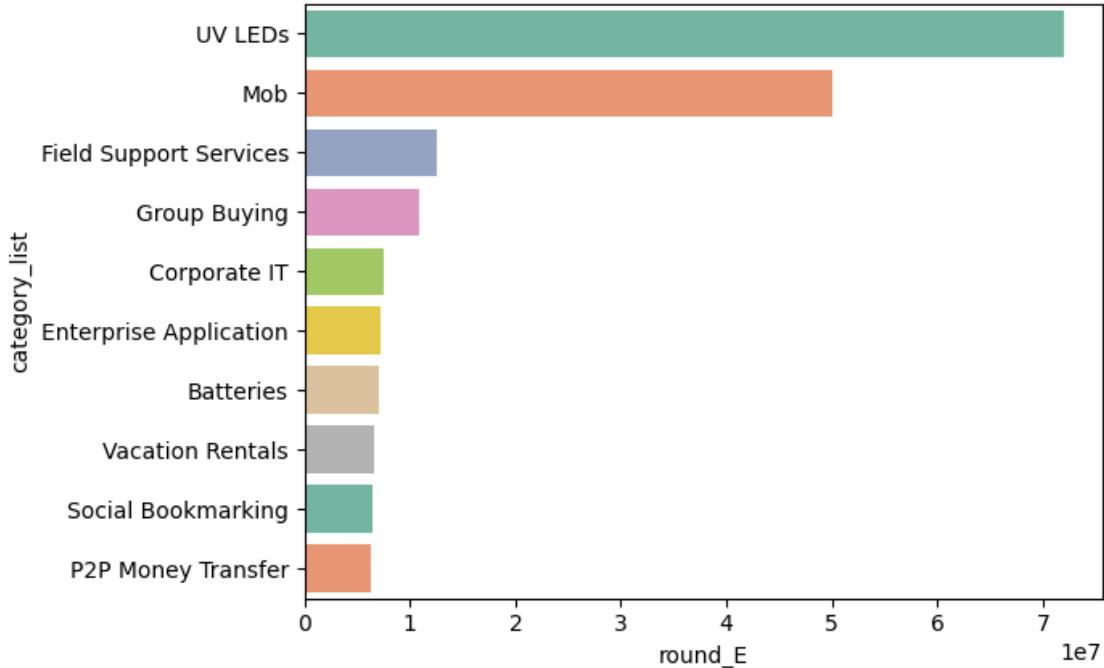
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')

[ ]: <Axes: xlabel='round_E', ylabel='category_list'>
```



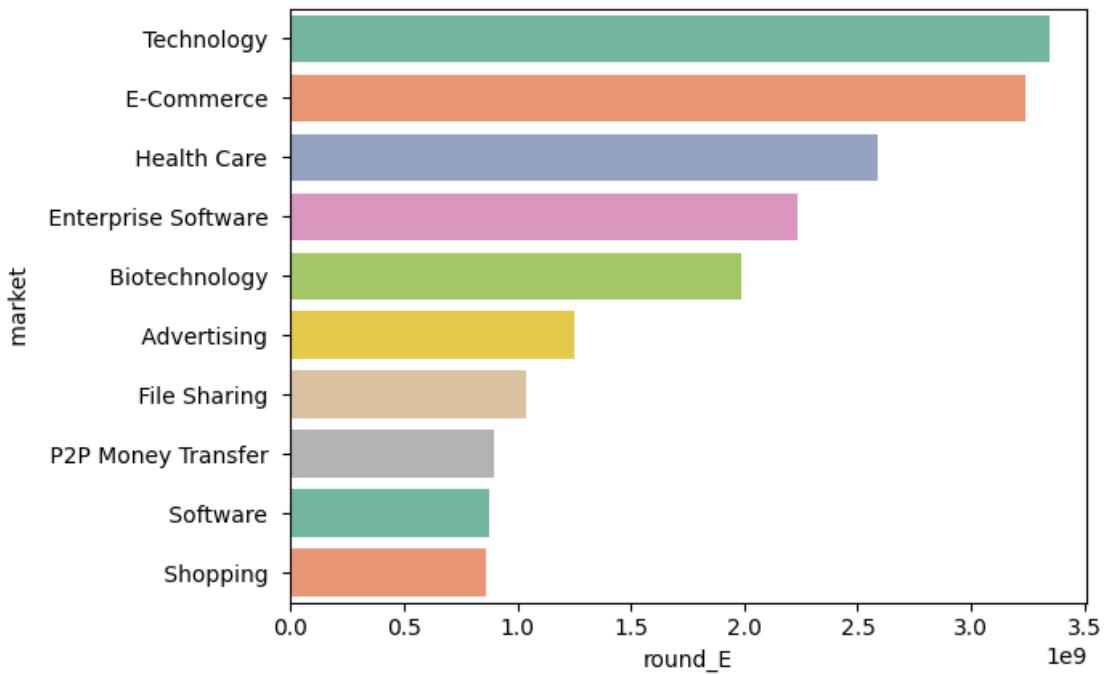
```
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'mean'}).reset_index() .  
    .sort_values(column, ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_E', ylabel='category_list'>
```



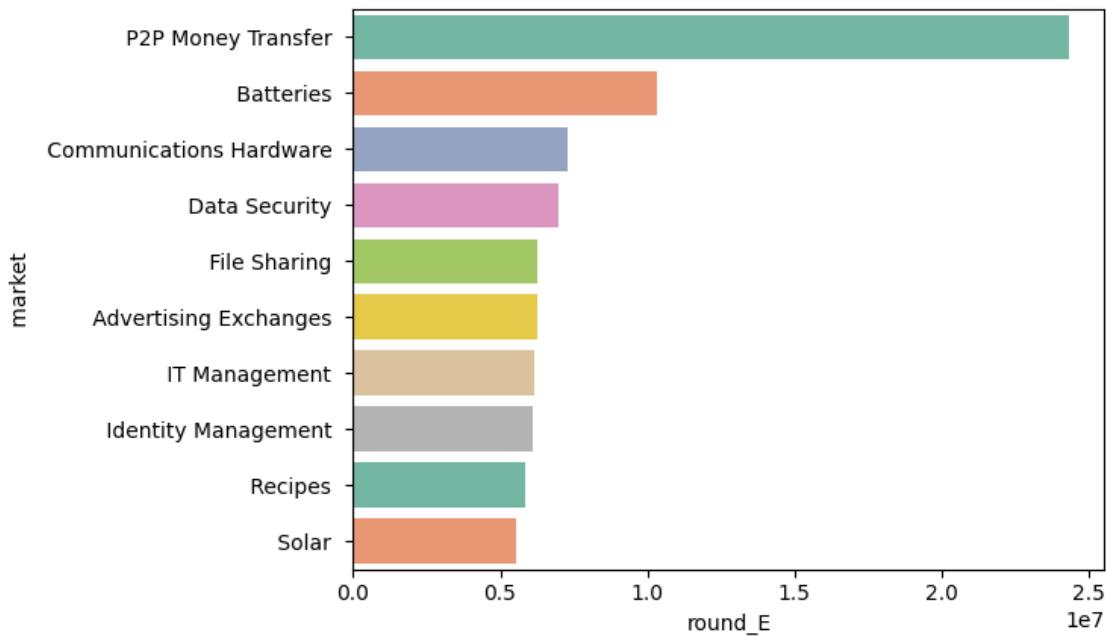
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'sum'}).reset_index() .
    ↪sort_values(column,ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

[ ]: <Axes: xlabel='round\_E', ylabel=' market '>



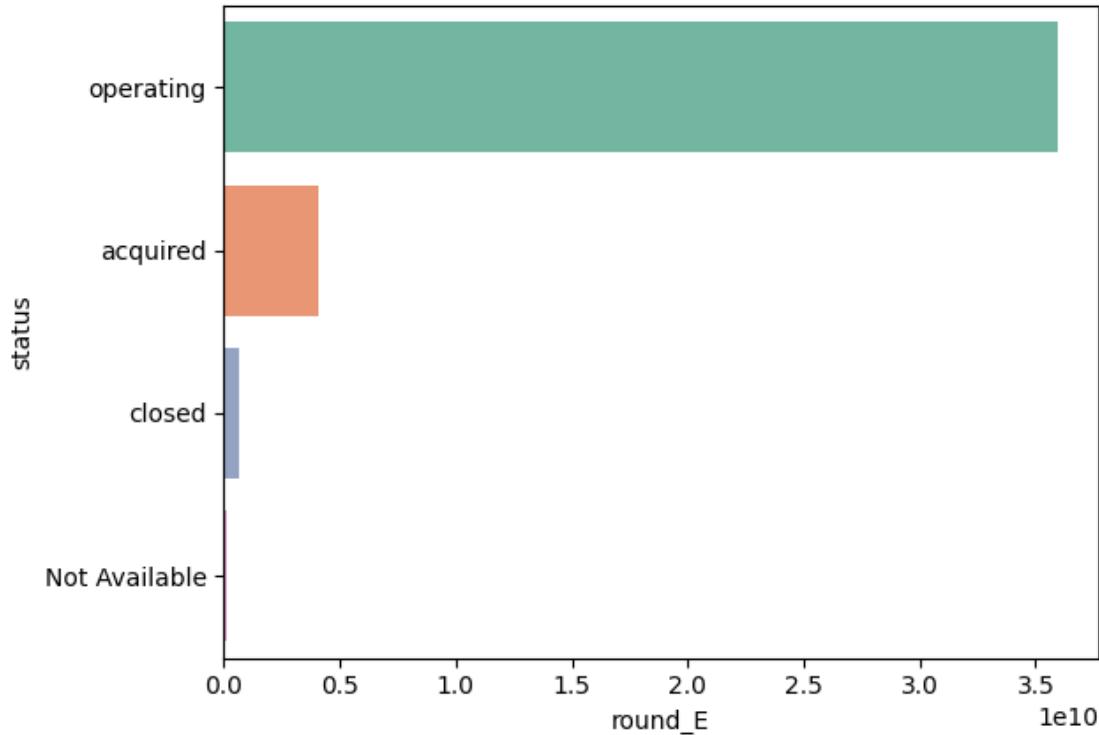
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='round_E', ylabel=' market '>
```



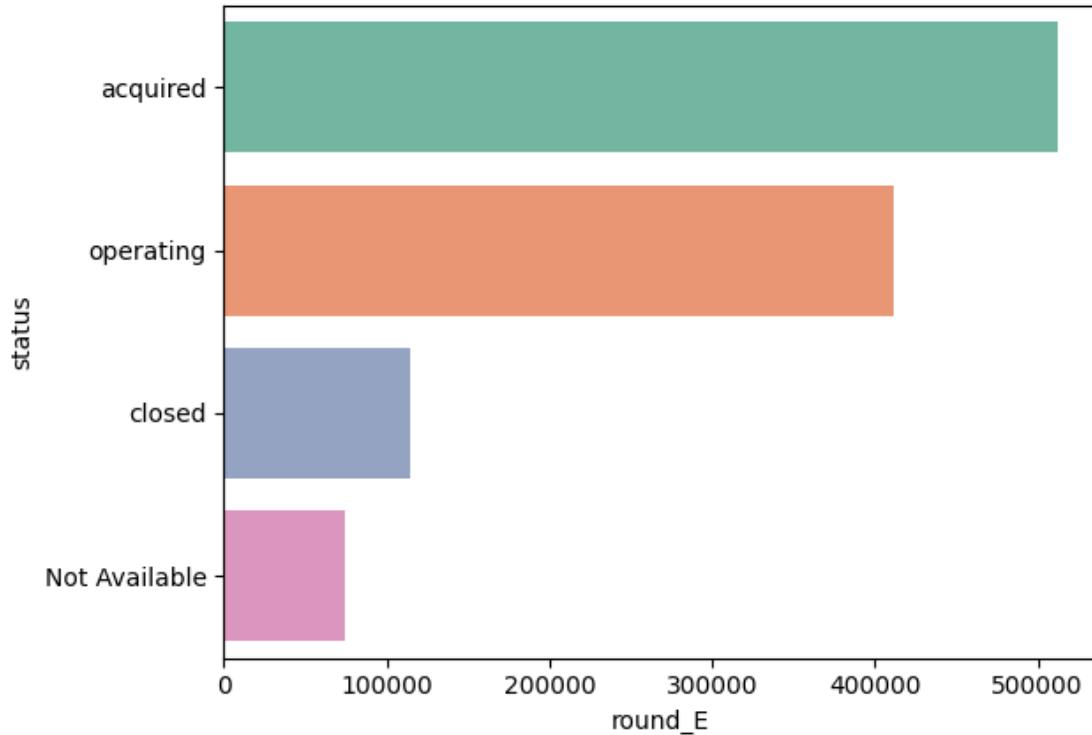
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'sum'}).reset_index() .  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['status'],palette='Set2')
```

```
[ ]: <Axes: xlabel='round_E', ylabel='status'>
```



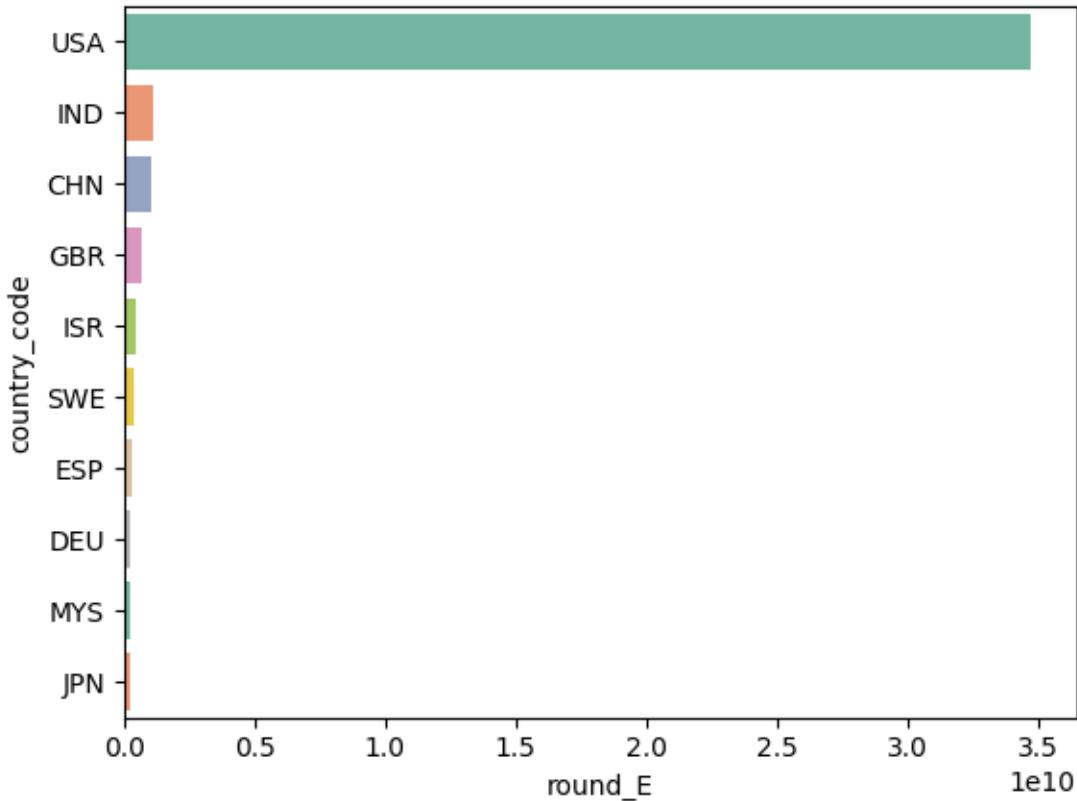
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'mean'}).reset_index()
      .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_E', ylabel='status'>
```



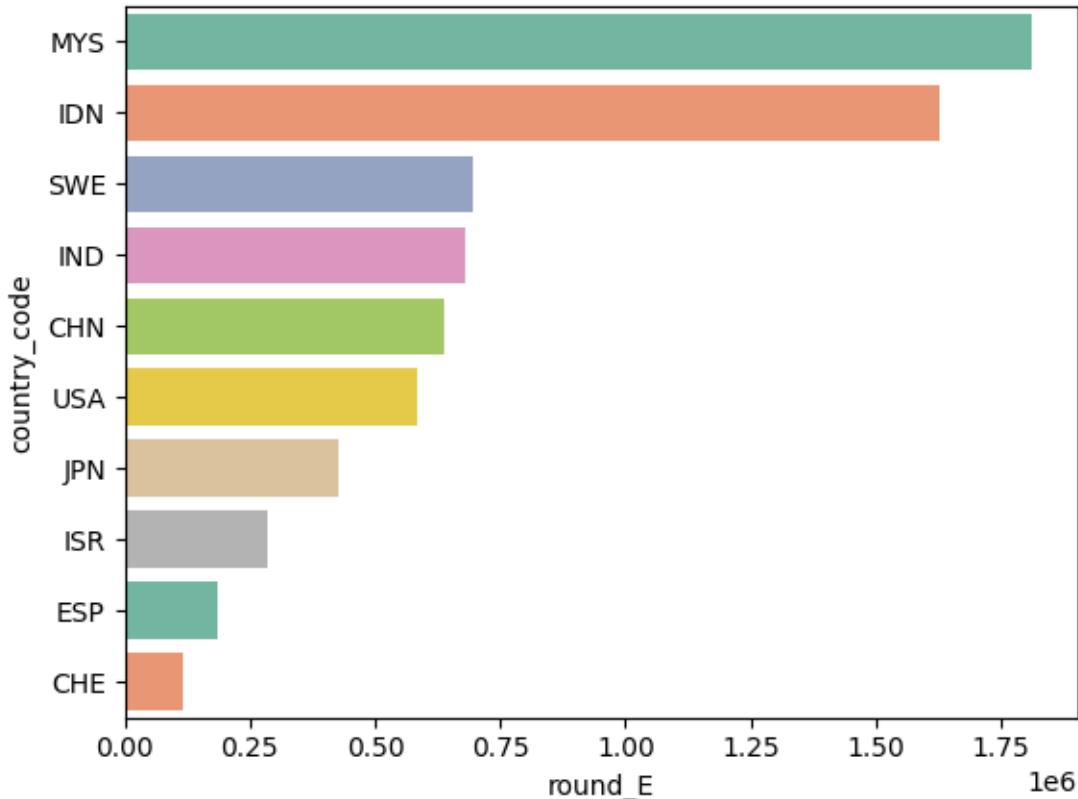
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column,ascending=False).head(11)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_E', ylabel='country_code'>
```



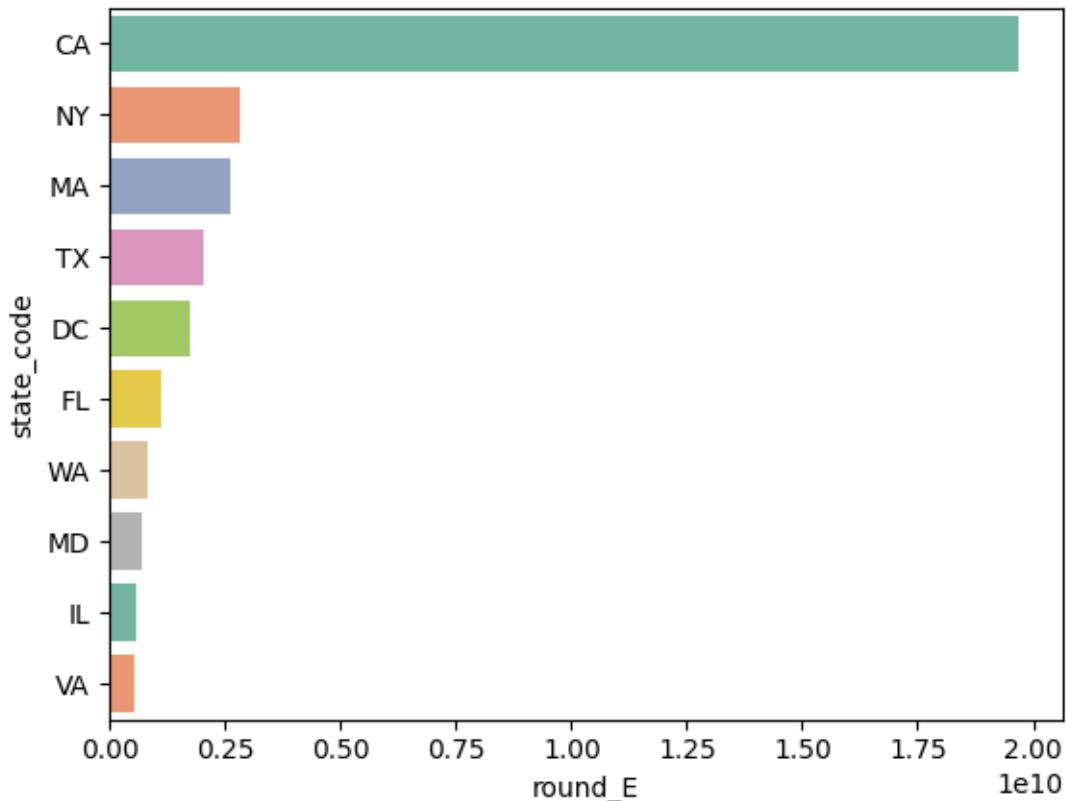
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_E', ylabel='country_code'>
```



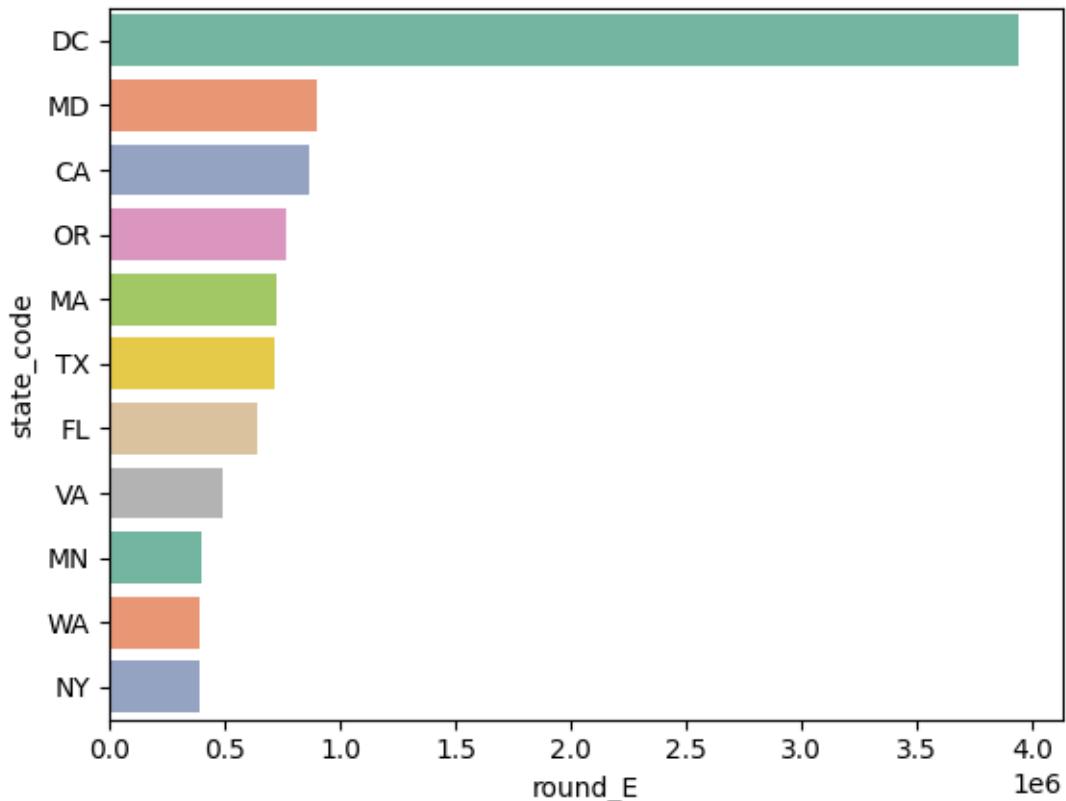
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_E', ylabel='state_code'>
```



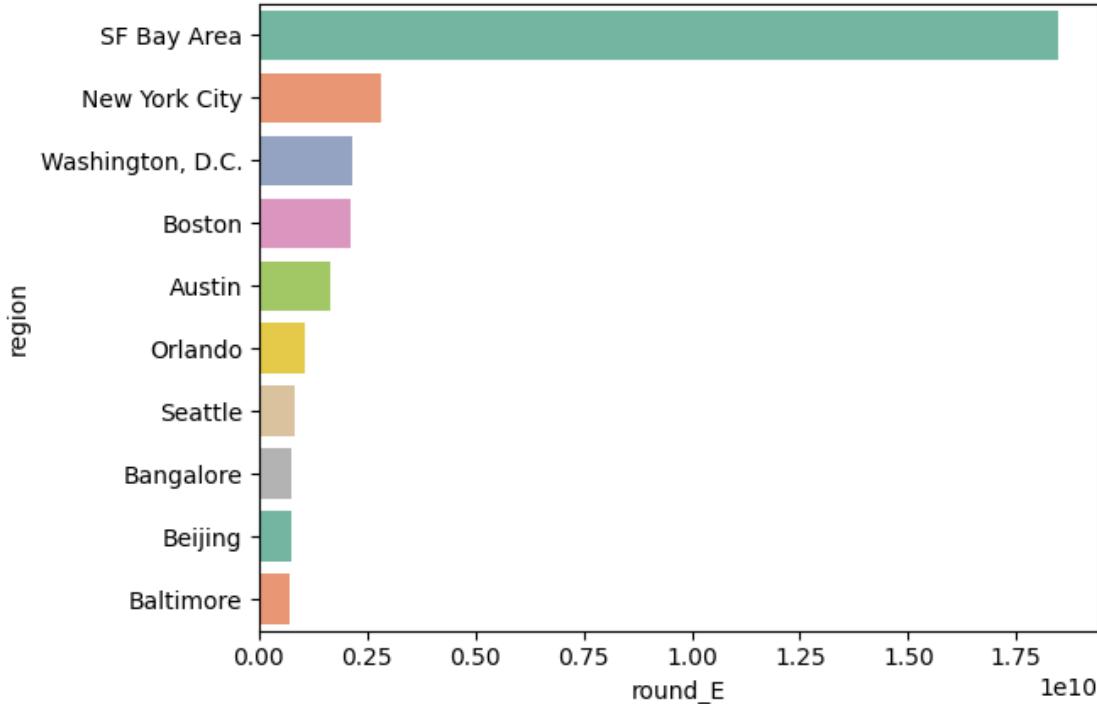
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'mean'}).reset_index().  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_E', ylabel='state_code'>
```



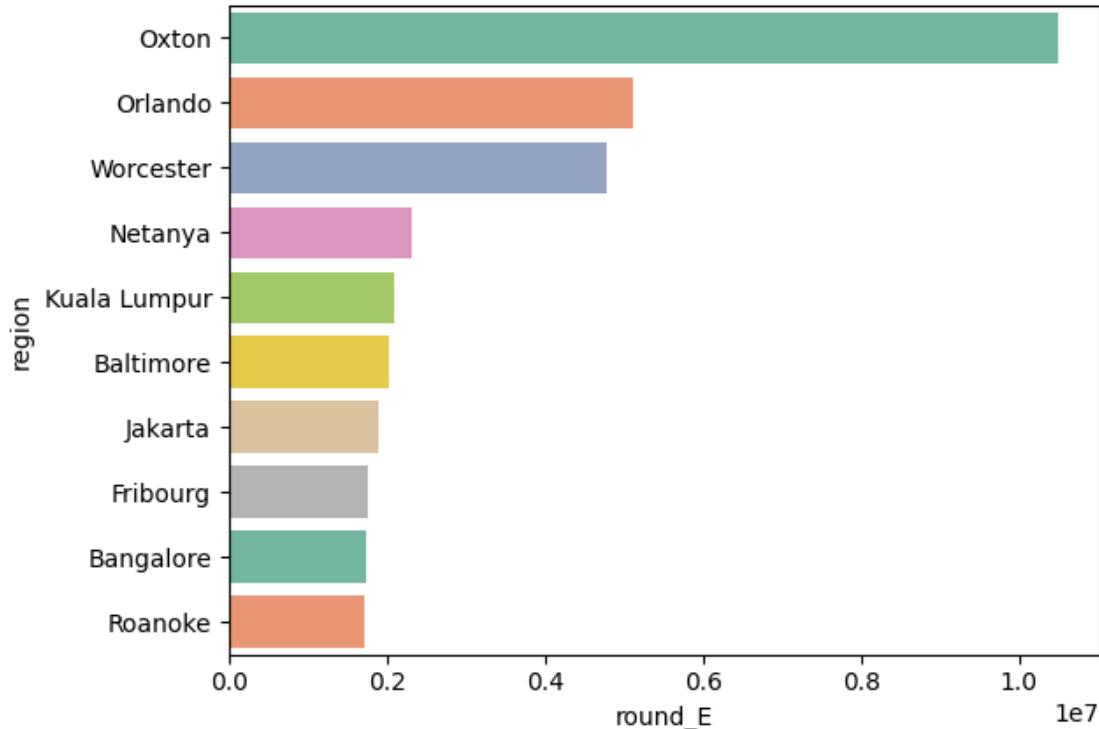
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_E', ylabel='region'>
```



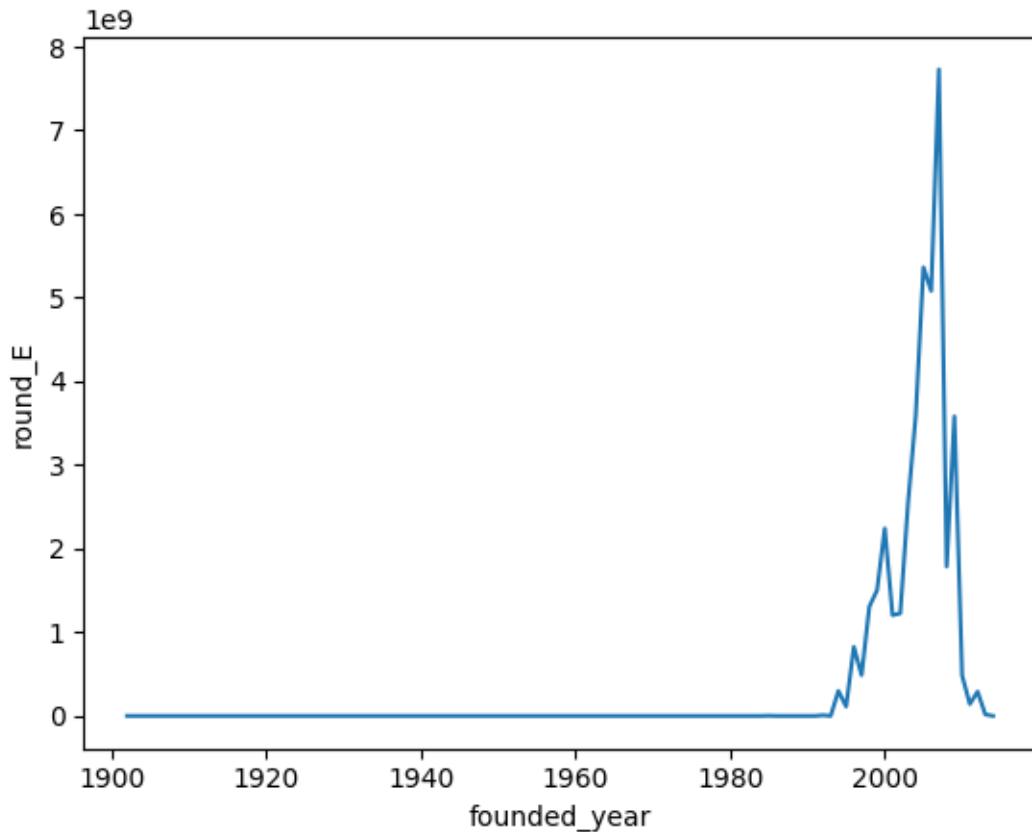
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'mean'}).reset_index()
     ↪sort_values(column, ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_E', ylabel='region'>
```



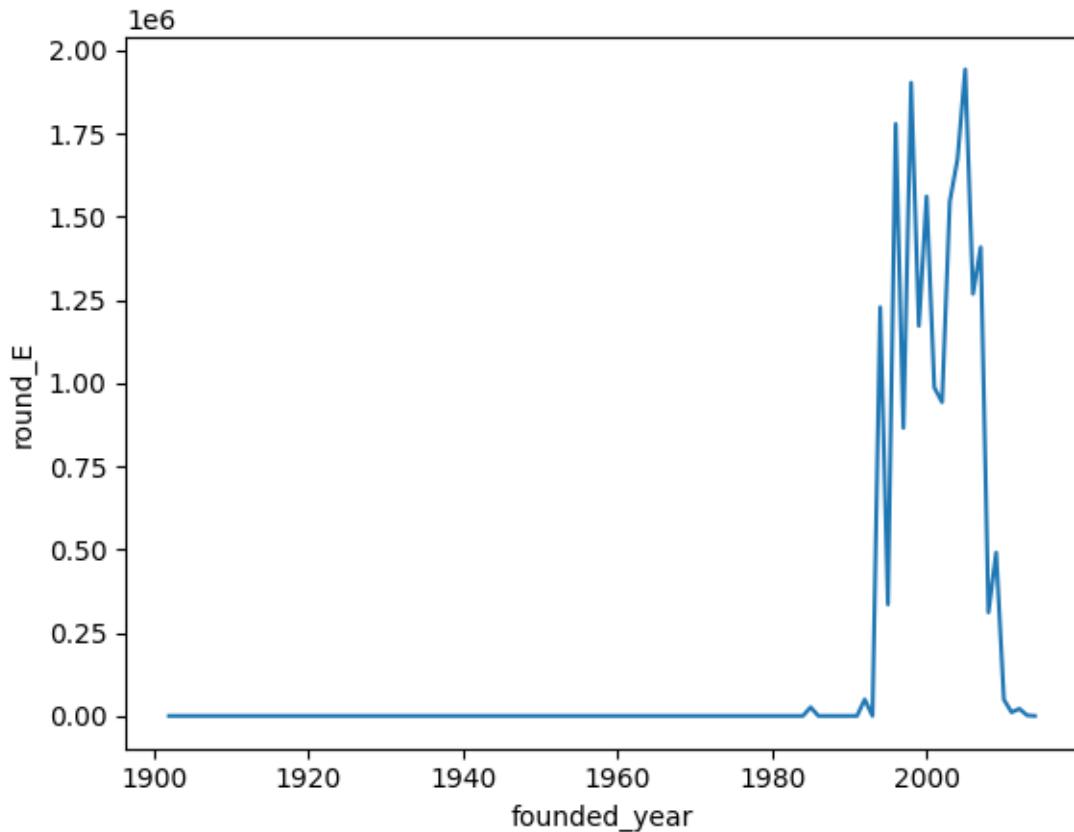
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'sum'}).reset_index().  
     .sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='round_E'>
```



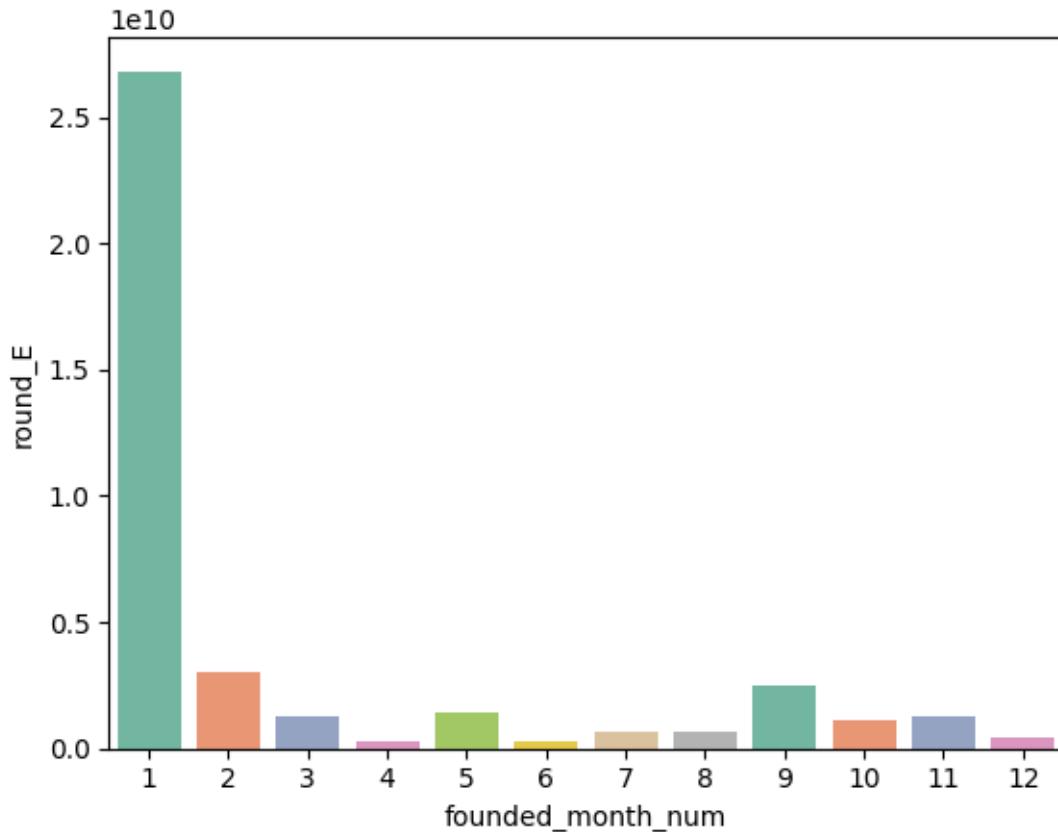
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='round_E'>
```



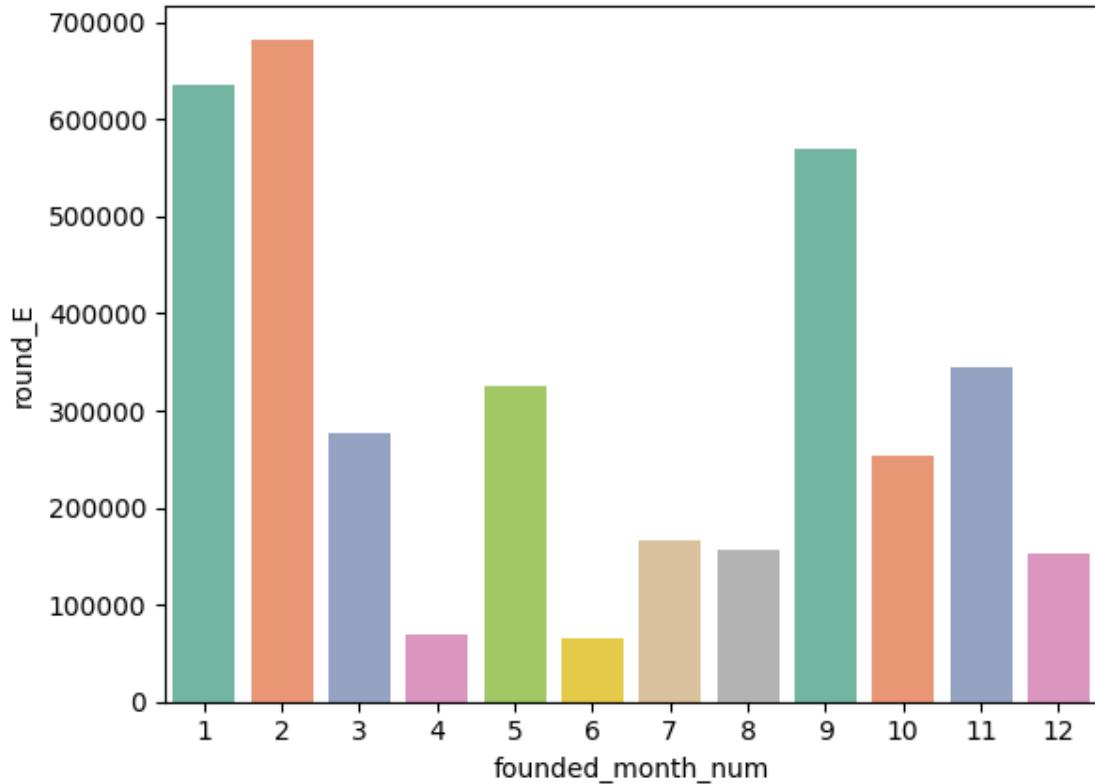
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'sum'}).
      ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='round_E'>
```



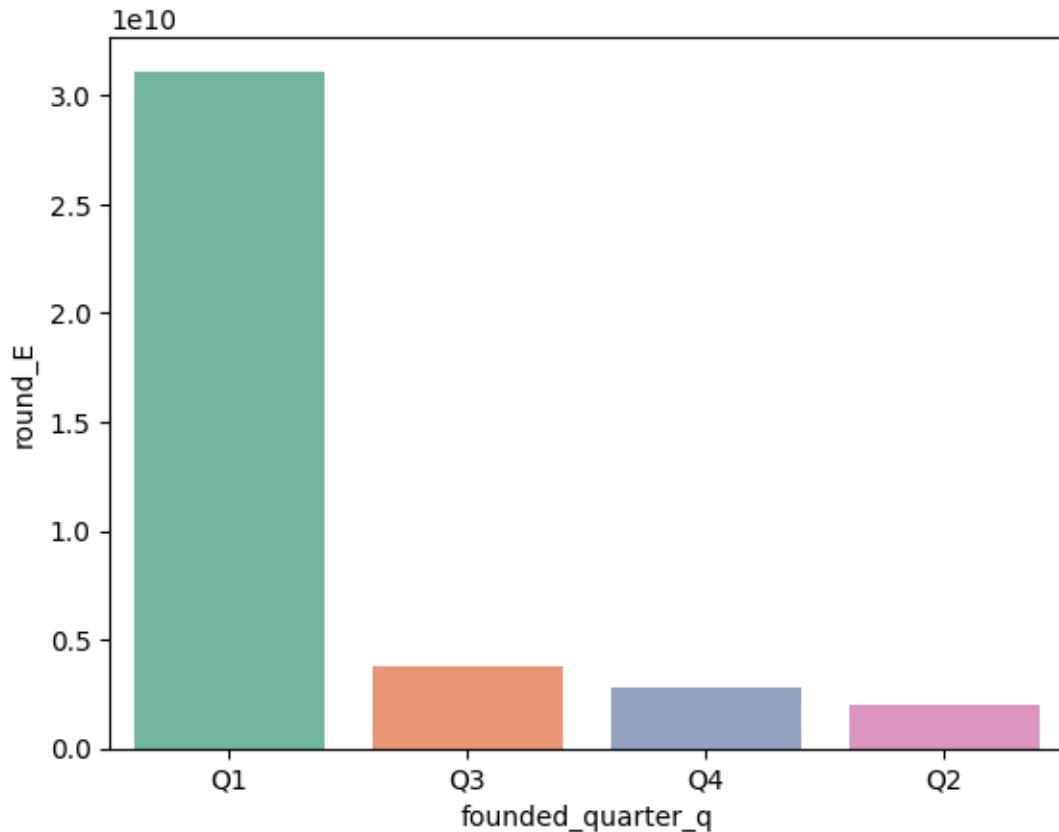
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='round_E'>
```



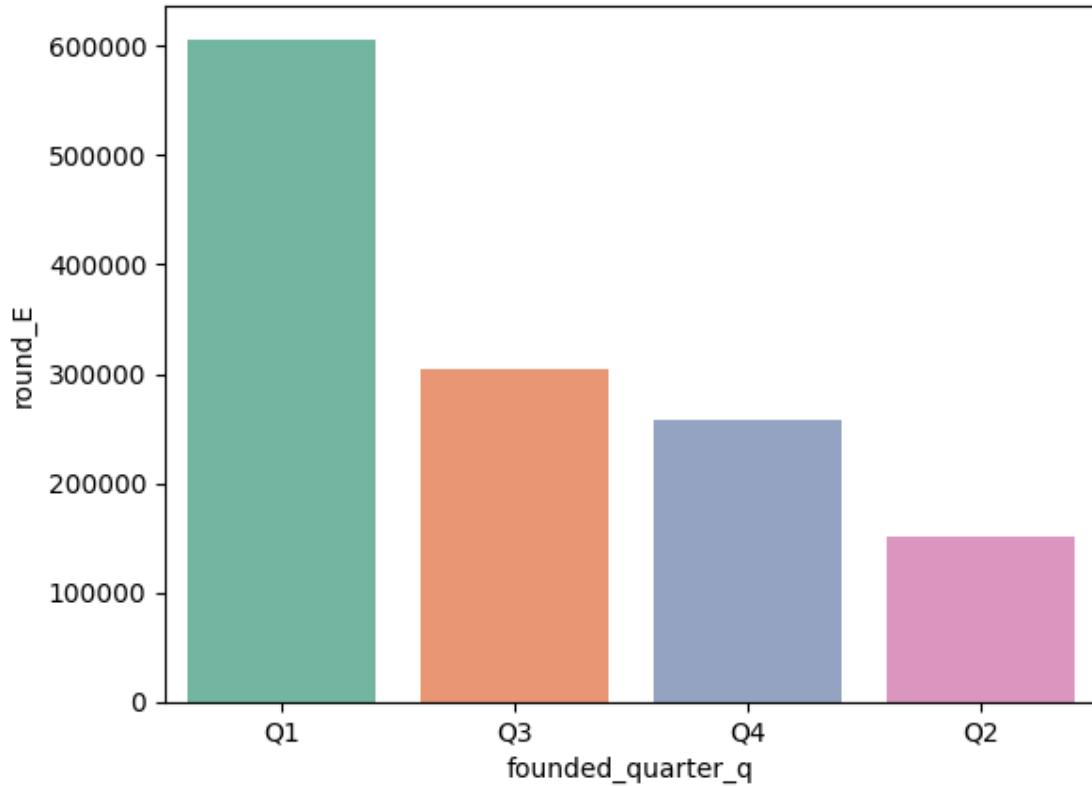
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'sum'}).
    ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q']!='Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'],palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='round_E'>
```



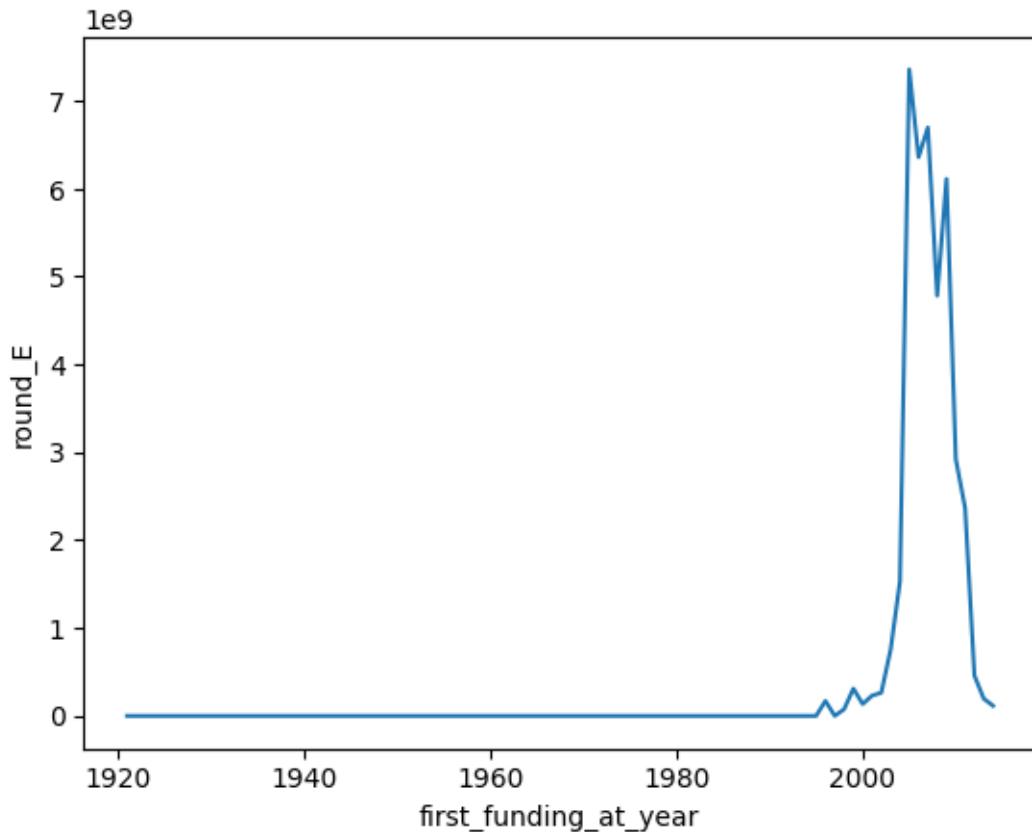
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='round_E'>
```



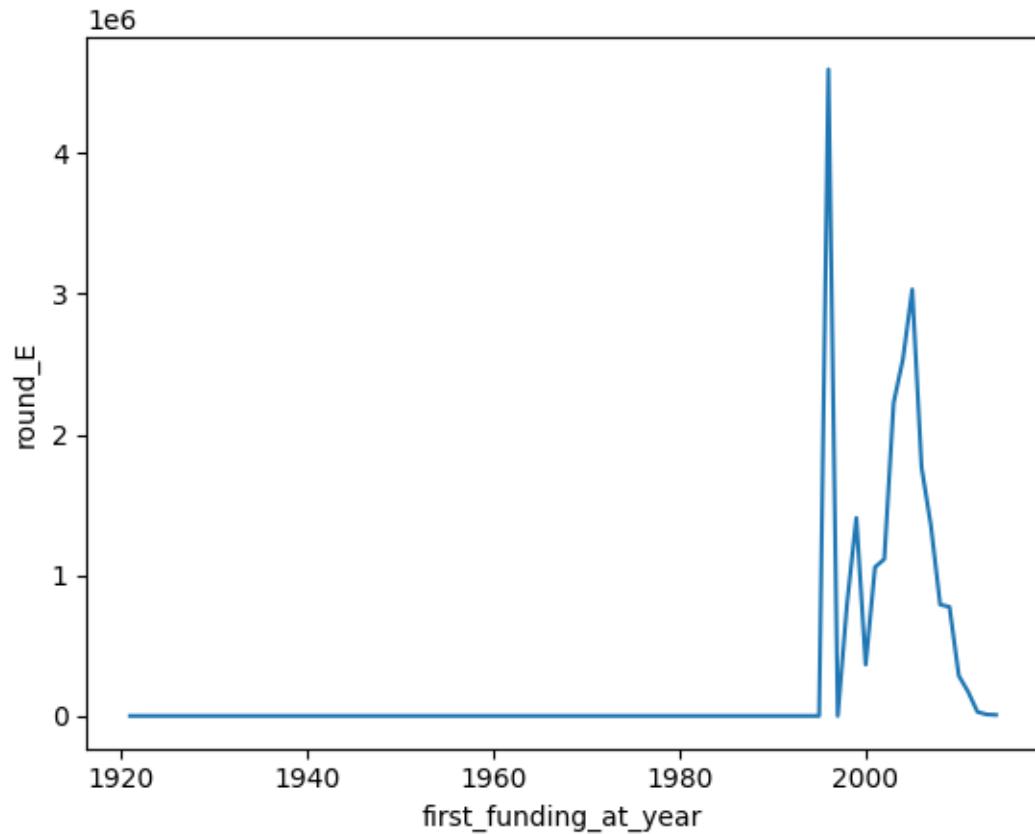
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='round_E'>
```



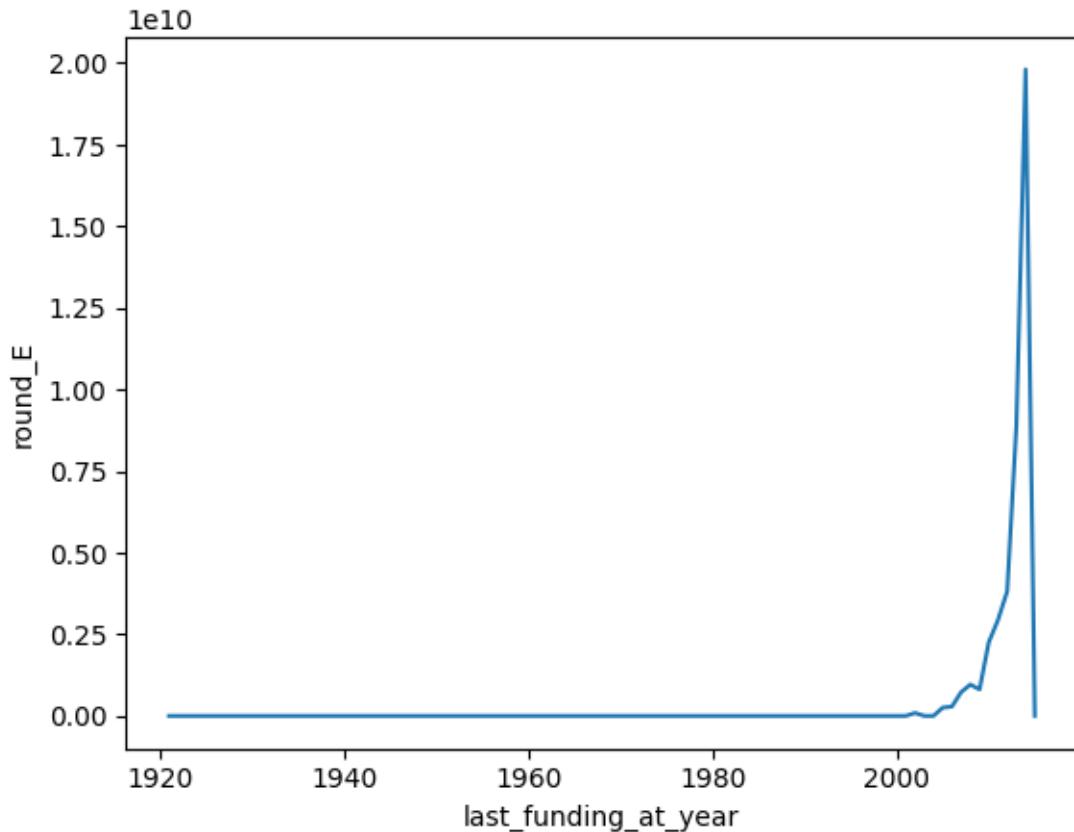
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='round_E'>
```



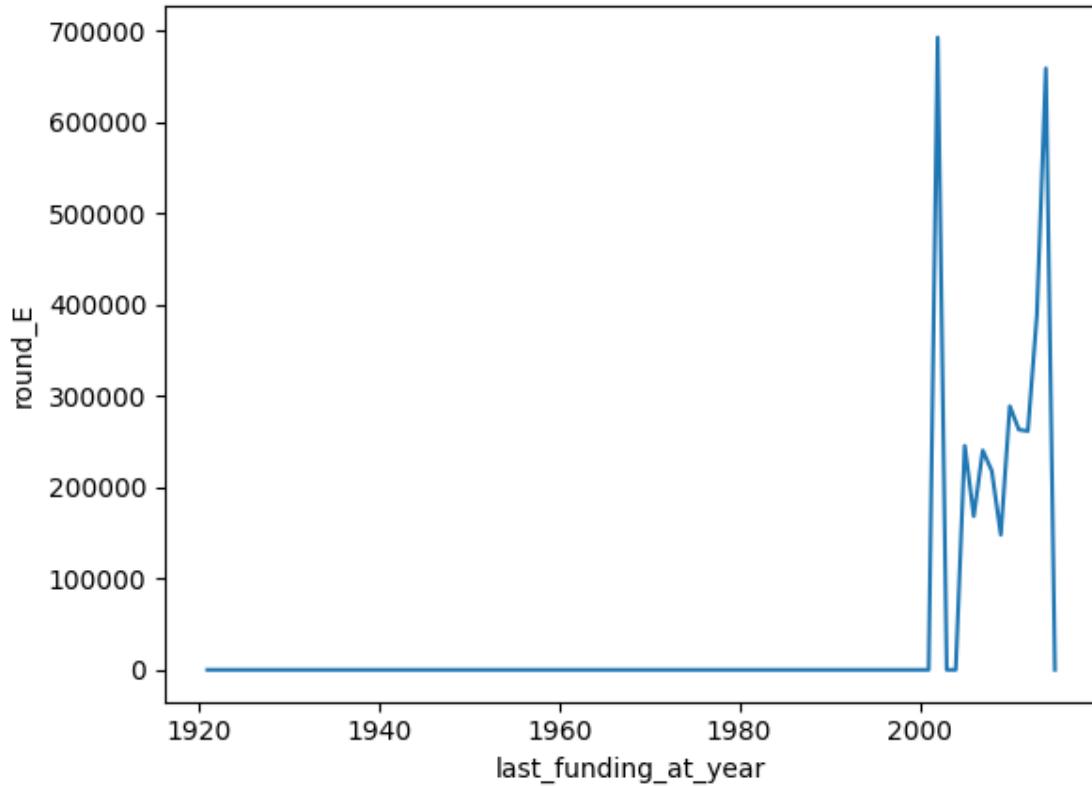
```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='round_E'>
```



```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='round_E'>
```



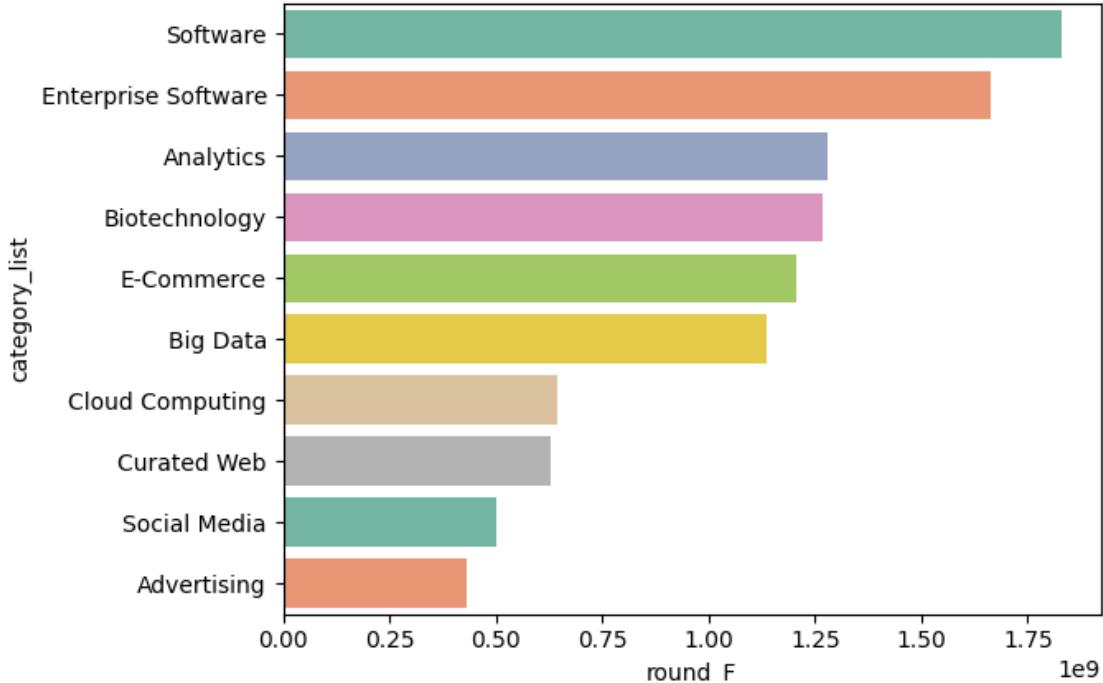
## 1.23 Round\_F

Average and Total Analysis of the Round F Funds as shown below.

```
[ ]: column = 'round_F'

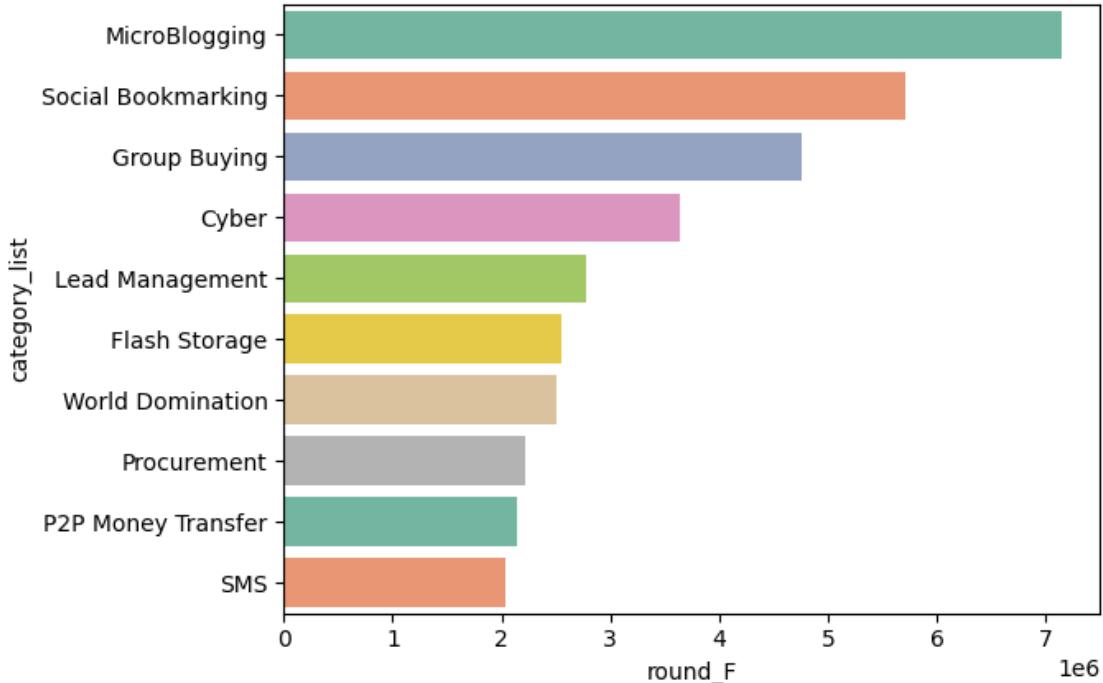
[ ]: df_plot = df_clean.groupby('category_list').agg({column: 'sum'}).reset_index()
     .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')

[ ]: <Axes: xlabel='round_F', ylabel='category_list'>
```



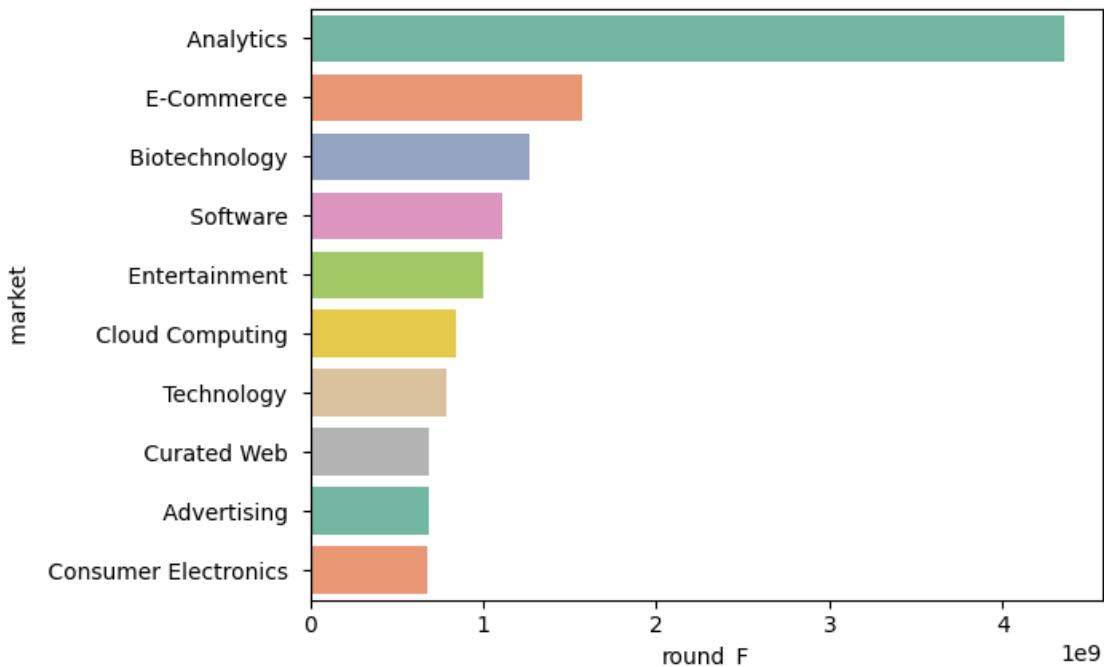
```
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_F', ylabel='category_list'>
```



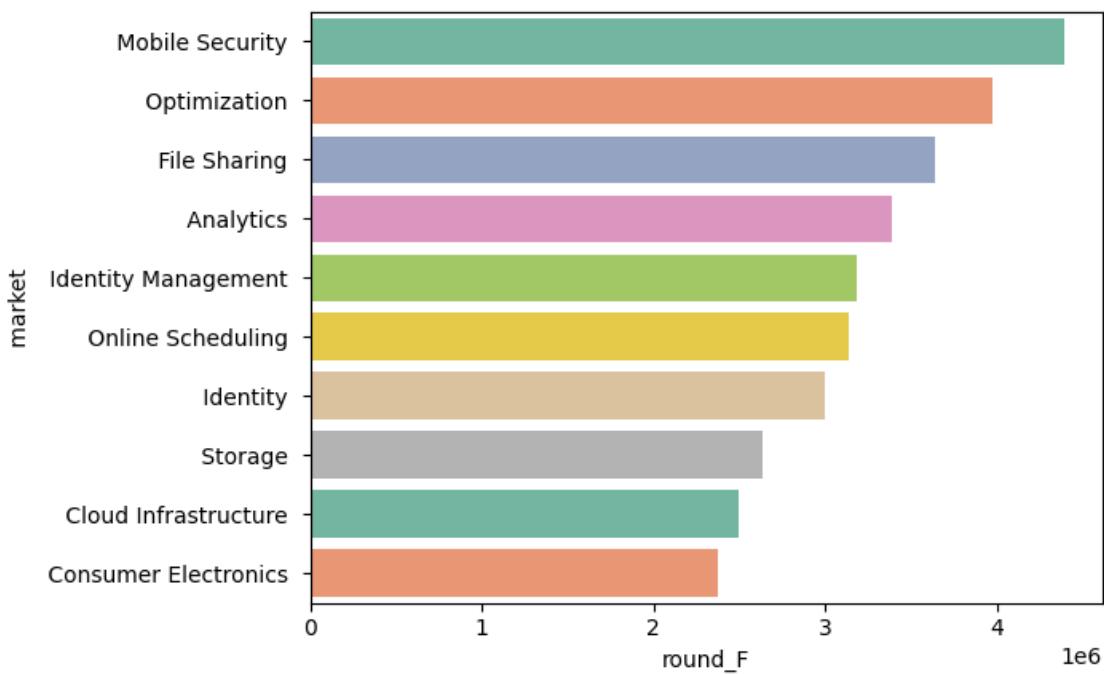
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'sum'}).reset_index().  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='round_F', ylabel=' market '>
```



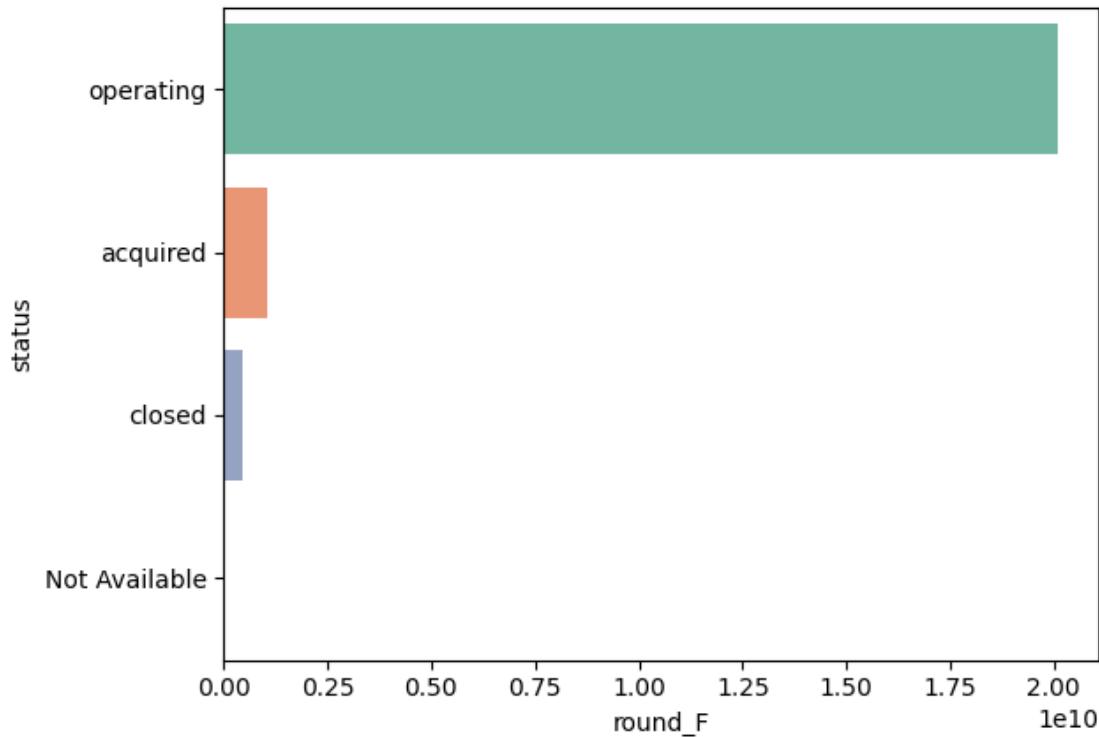
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'mean'}).reset_index()
    ↪sort_values(column,ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

[ ]: <Axes: xlabel='round\_F', ylabel=' market '>



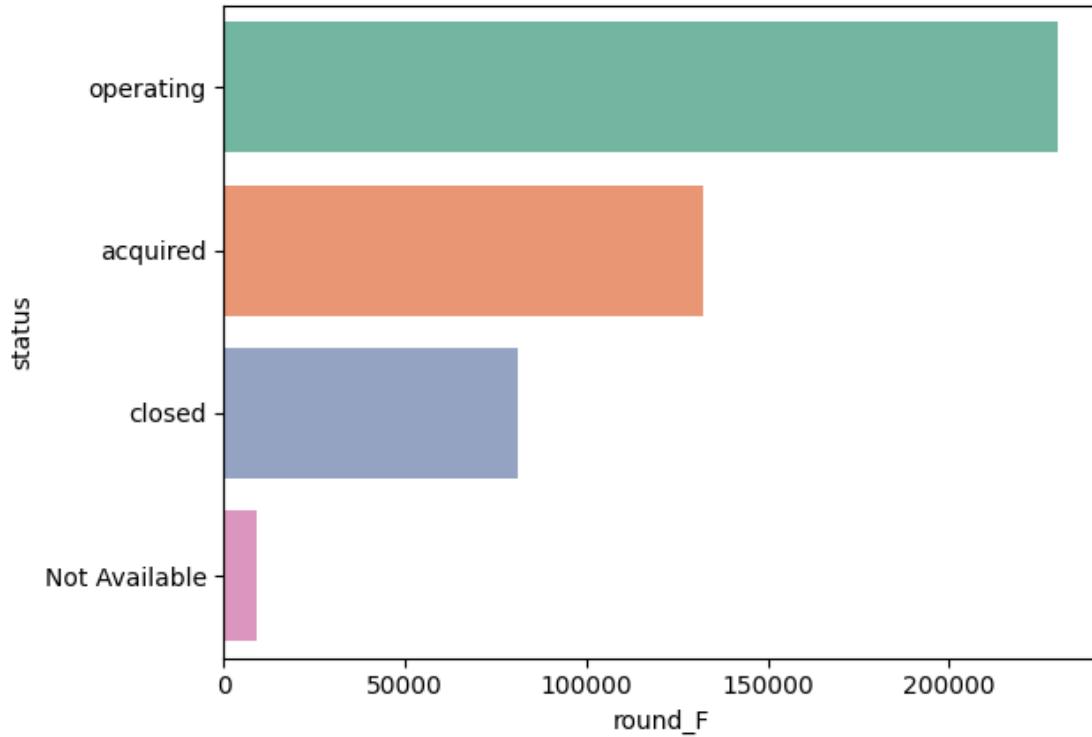
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_F', ylabel='status'>
```



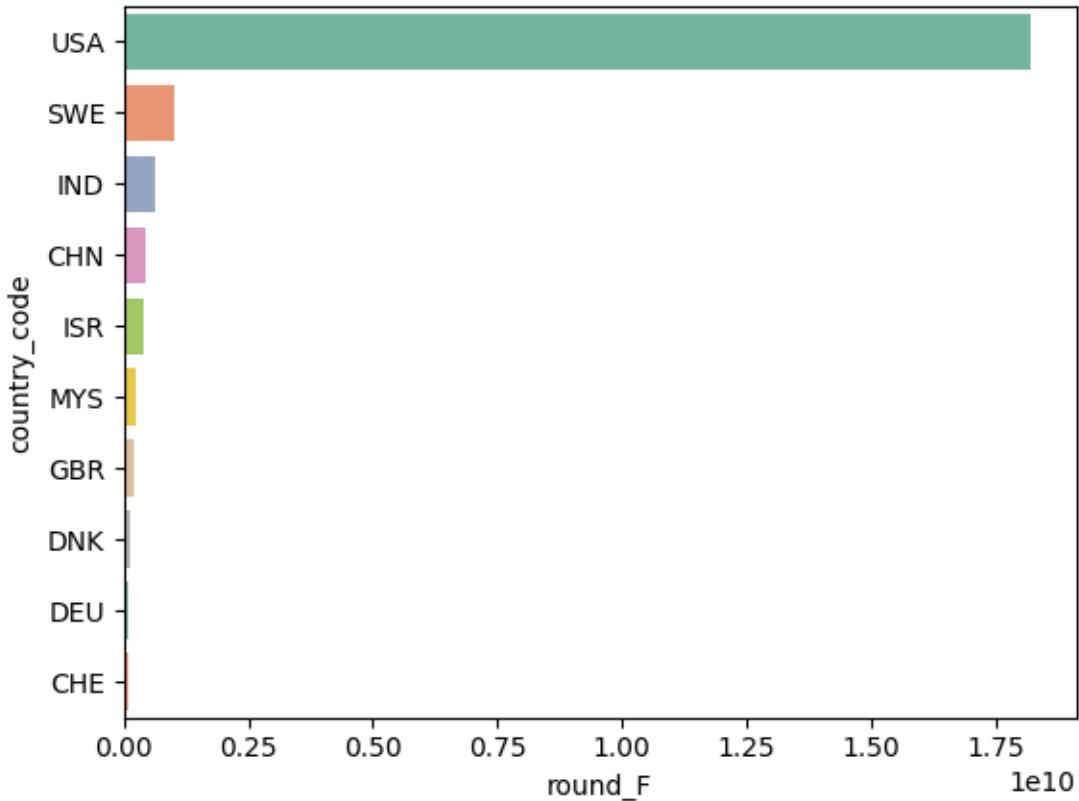
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'mean'}).reset_index() .
    ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_F', ylabel='status'>
```



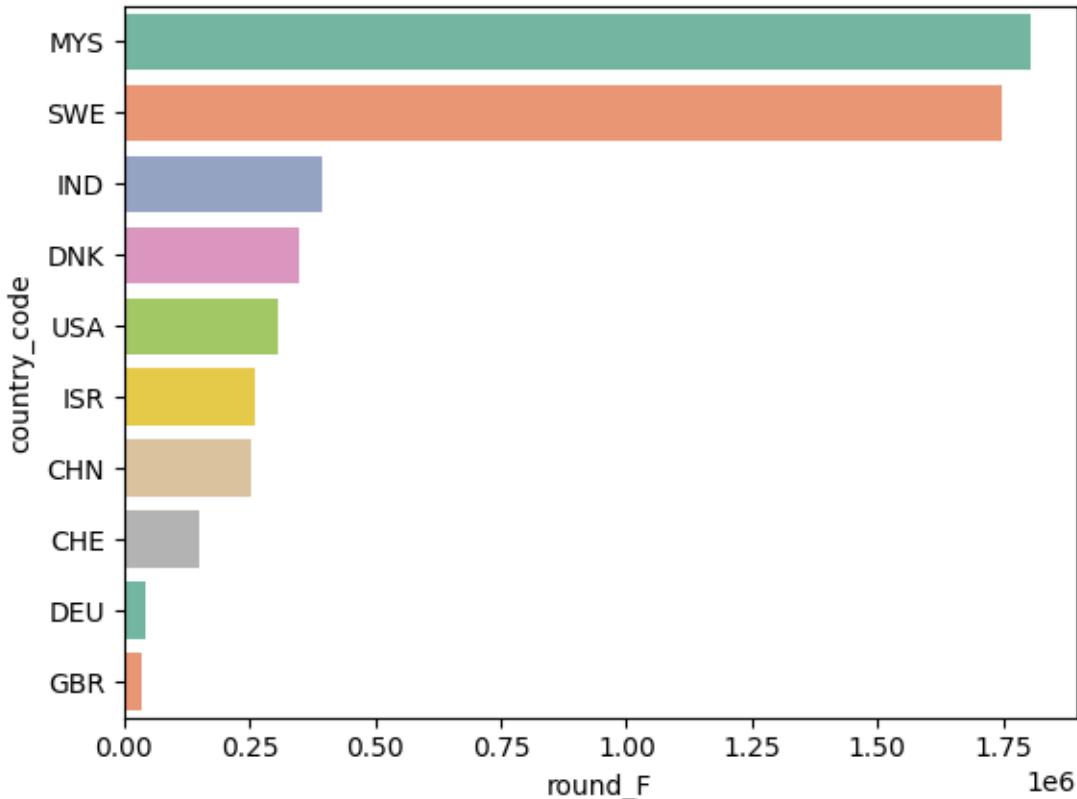
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column,ascending=False).head(11)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_F', ylabel='country_code'>
```



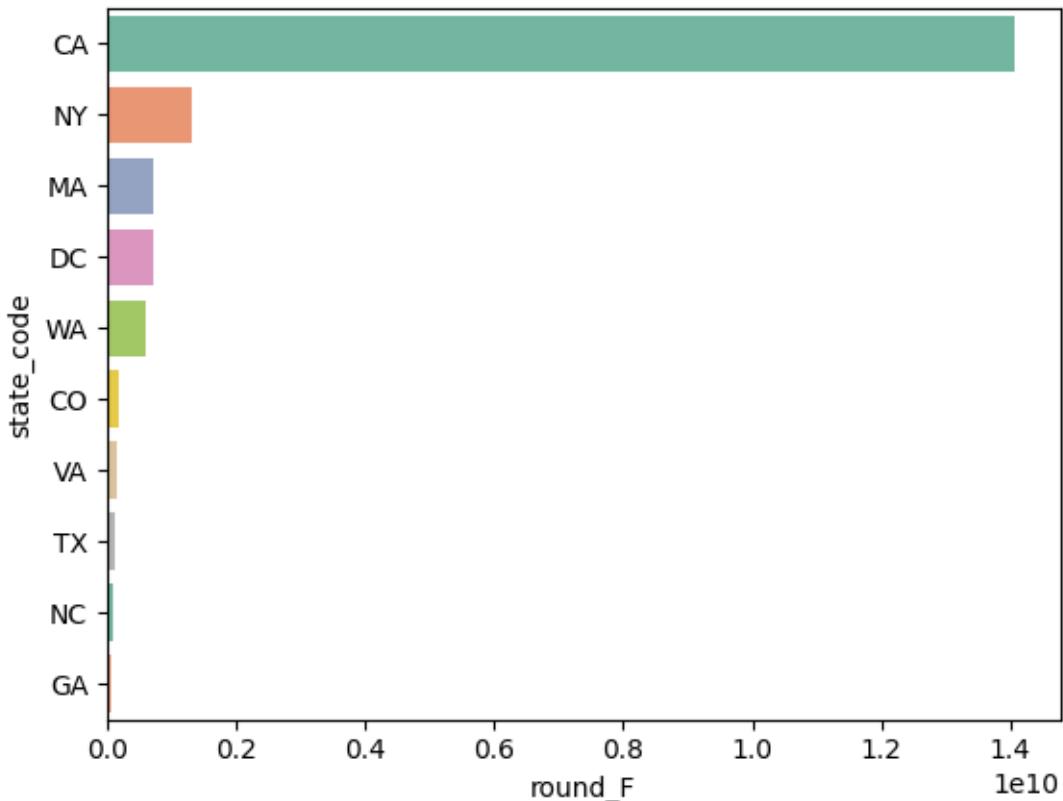
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_F', ylabel='country_code'>
```



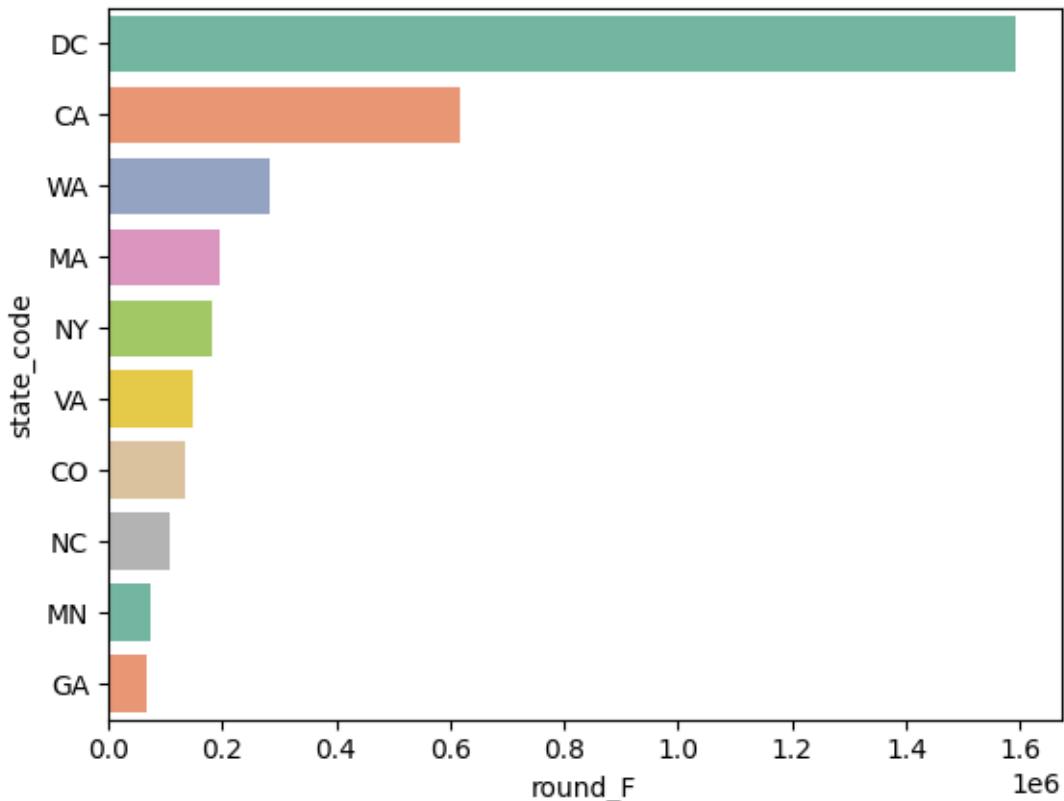
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'sum'}).reset_index().  
     ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_F', ylabel='state_code'>
```



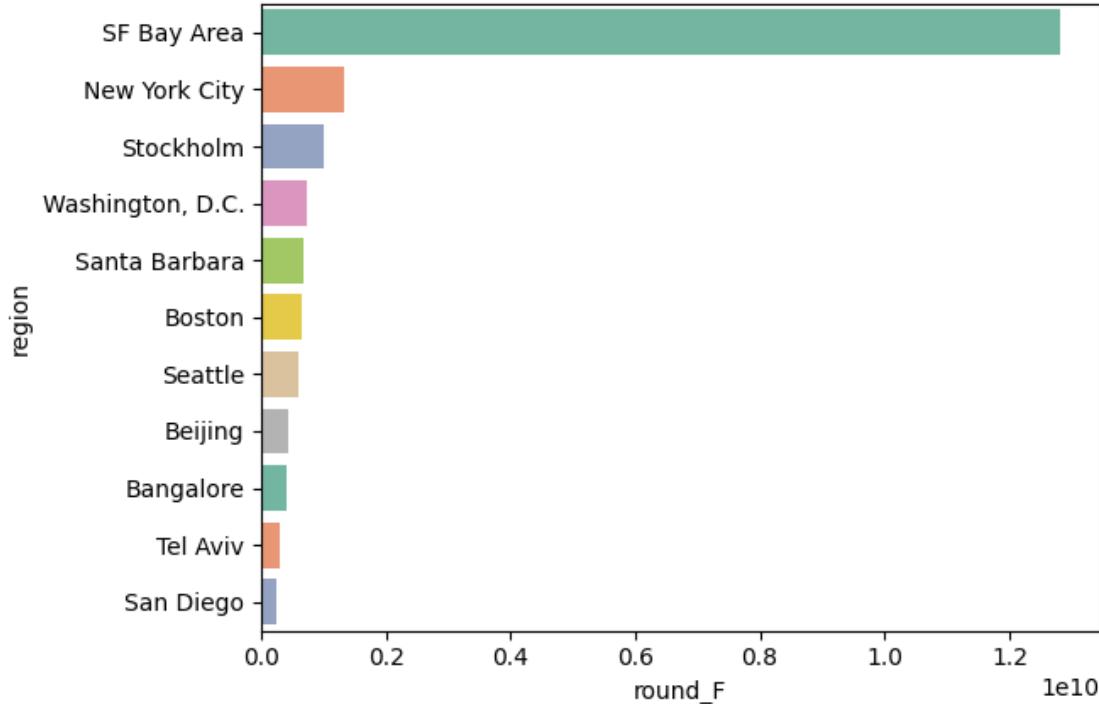
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_F', ylabel='state_code'>
```



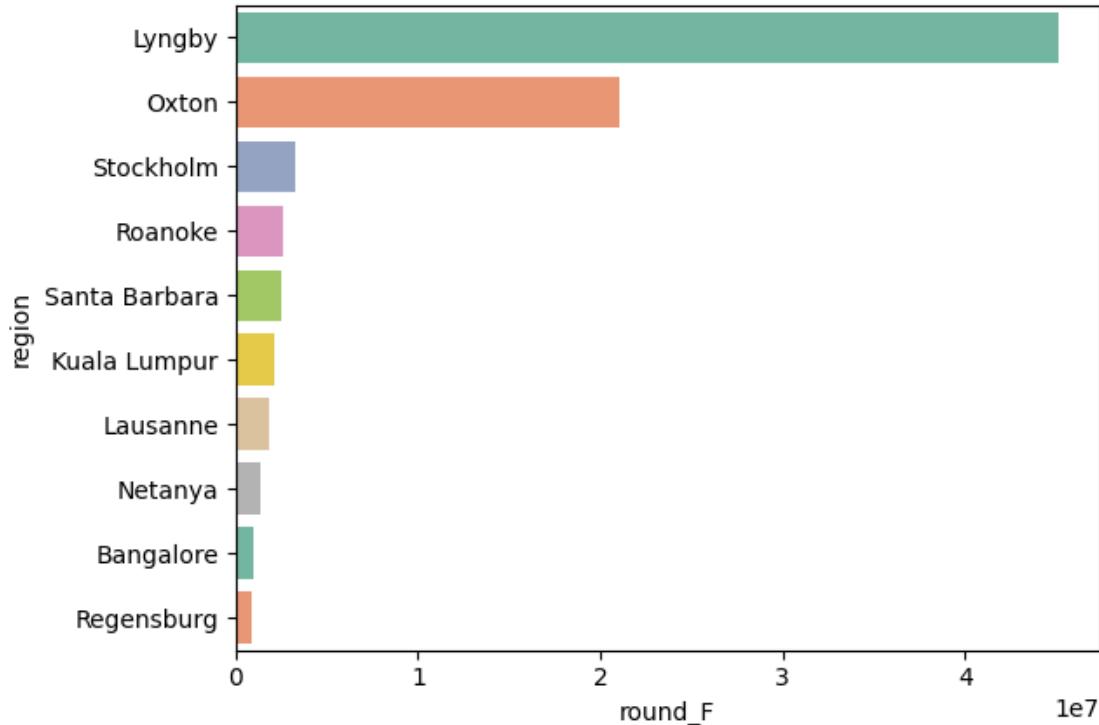
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_F', ylabel='region'>
```



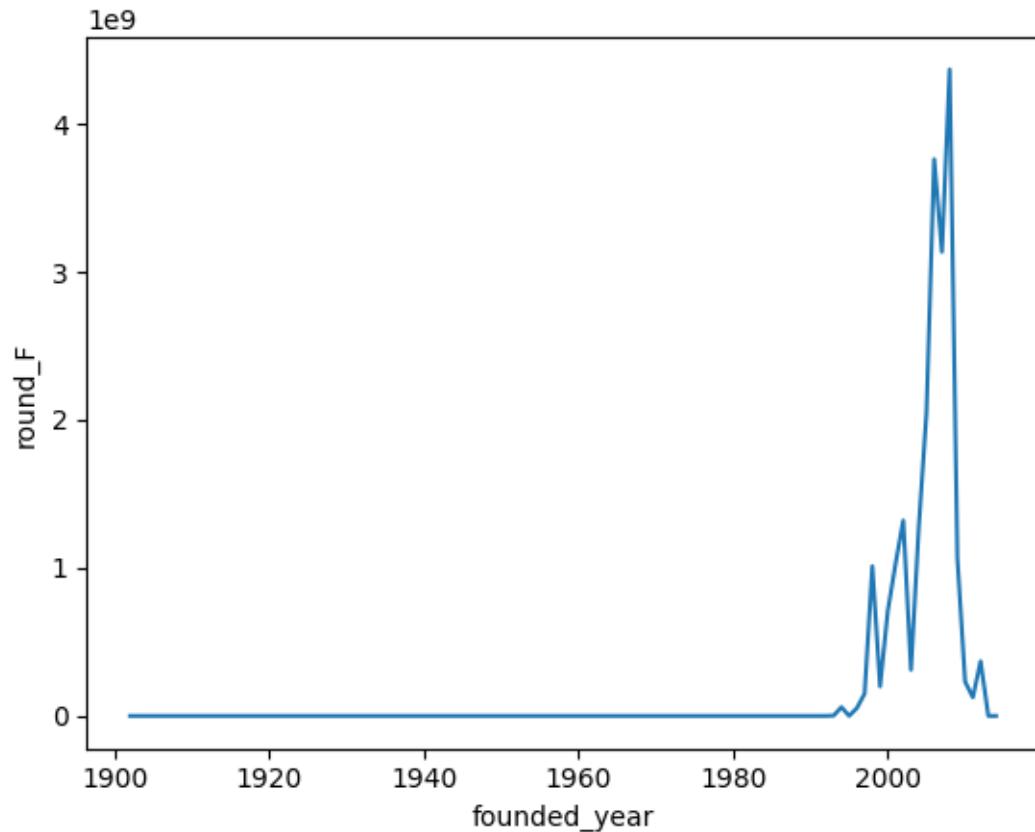
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'mean'}).reset_index().  
     ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['region']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_F', ylabel='region'>
```



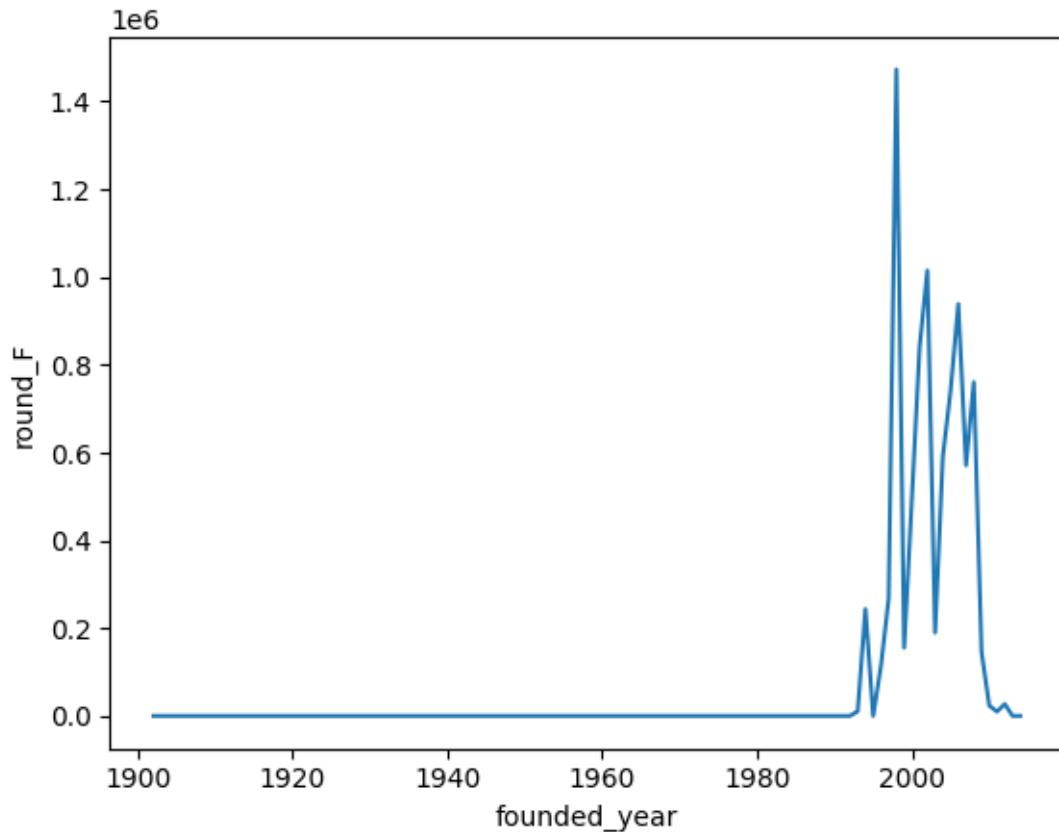
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'sum'}).reset_index().  
    ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='round_F'>
```



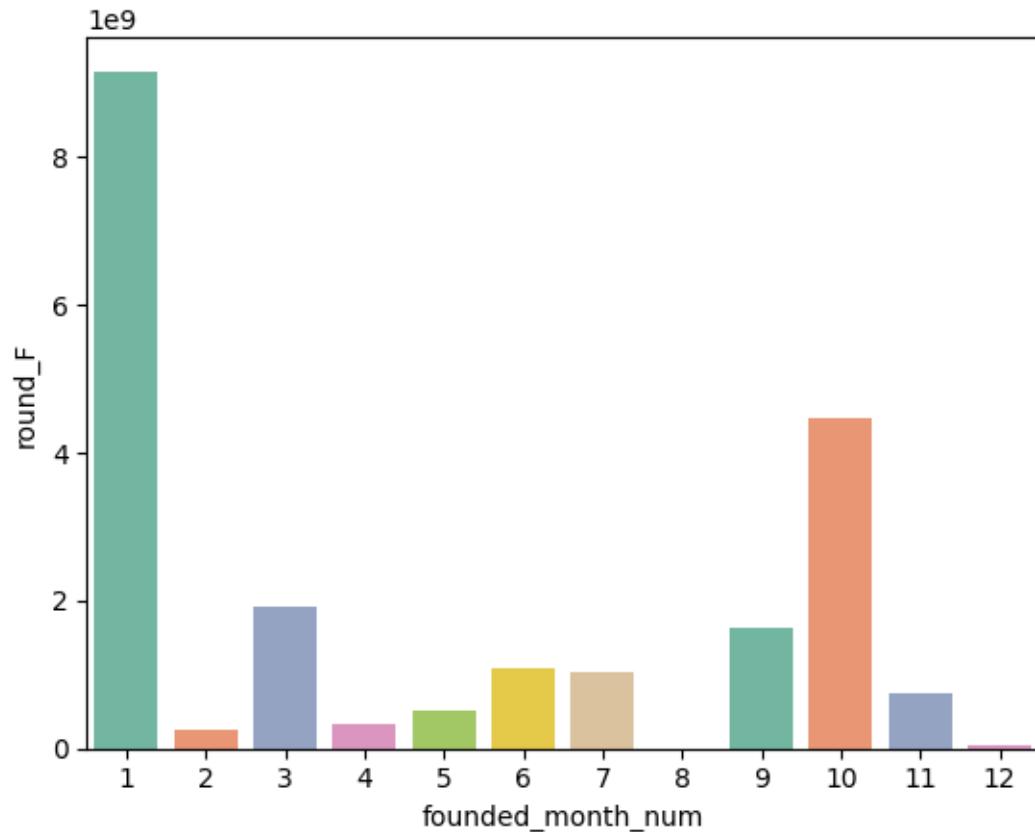
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'mean'}).reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='round_F'>
```



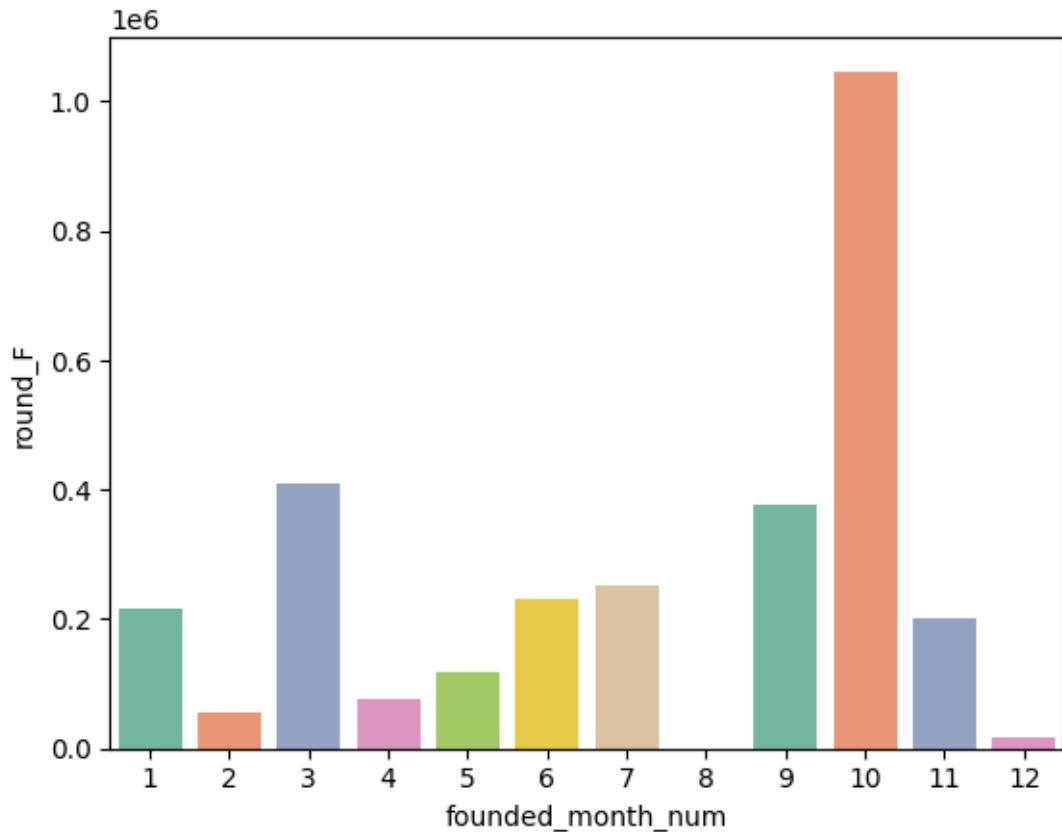
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_month_num'] > 0]  
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='round_F'>
```



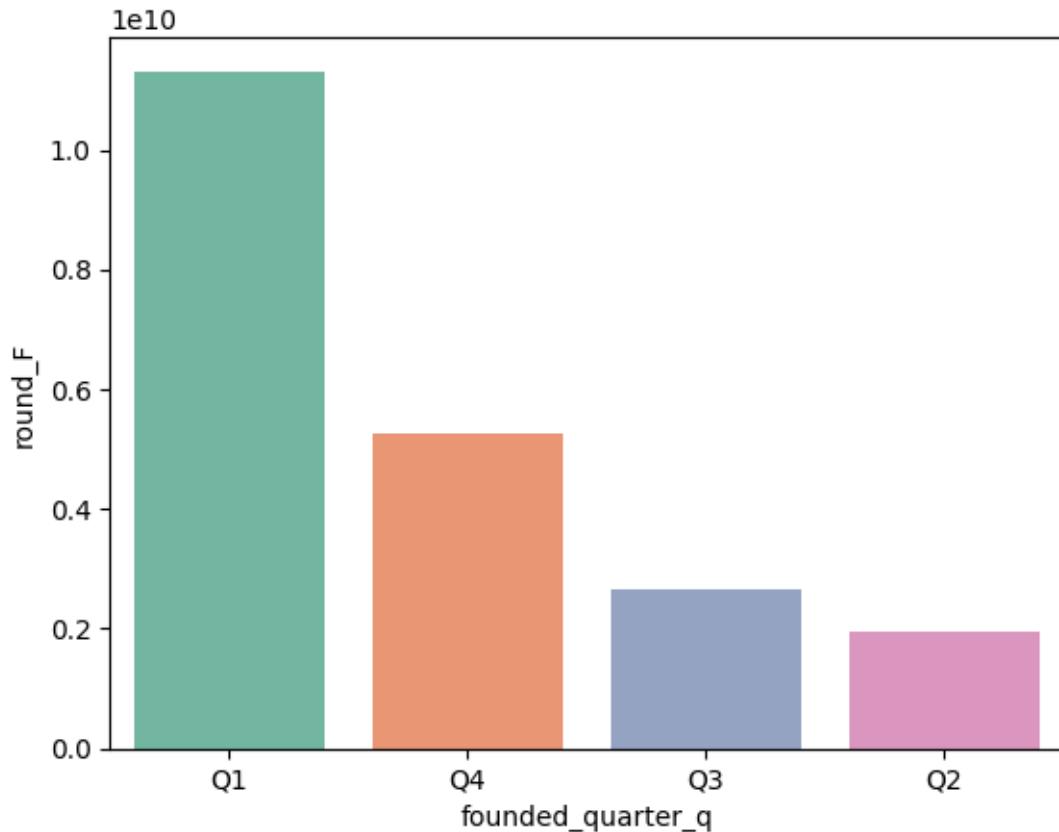
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='round_F'>
```



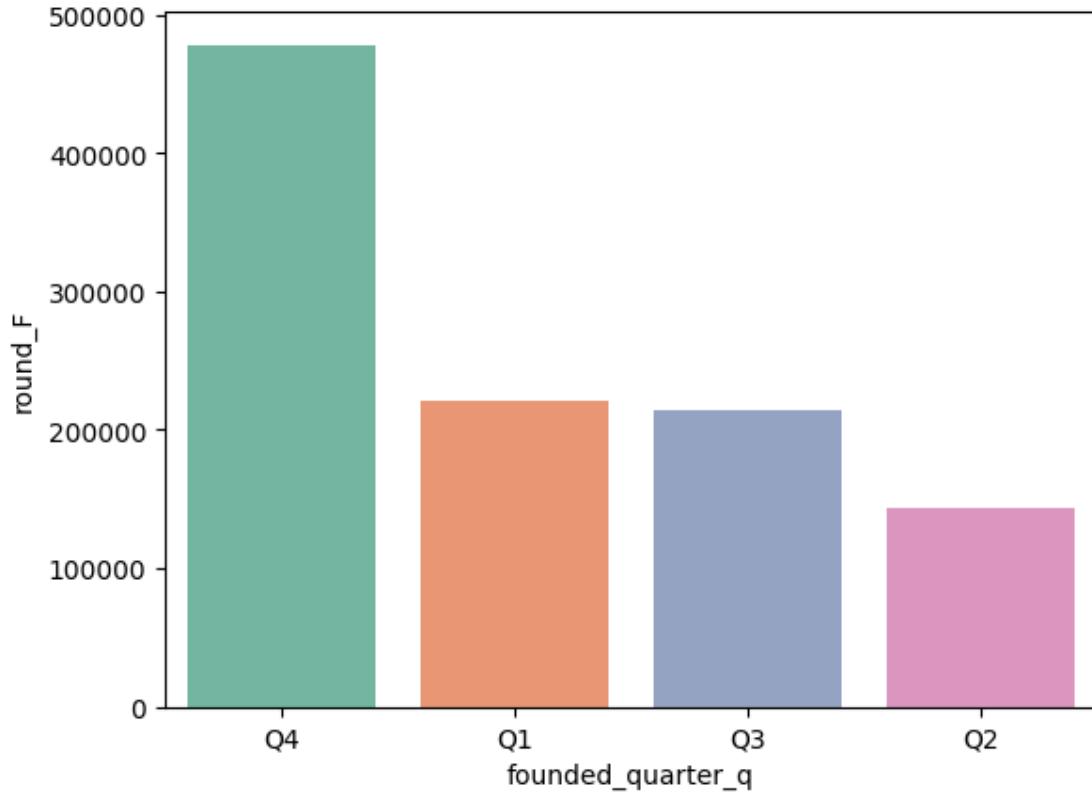
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'sum'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q']!= 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='round_F'>
```



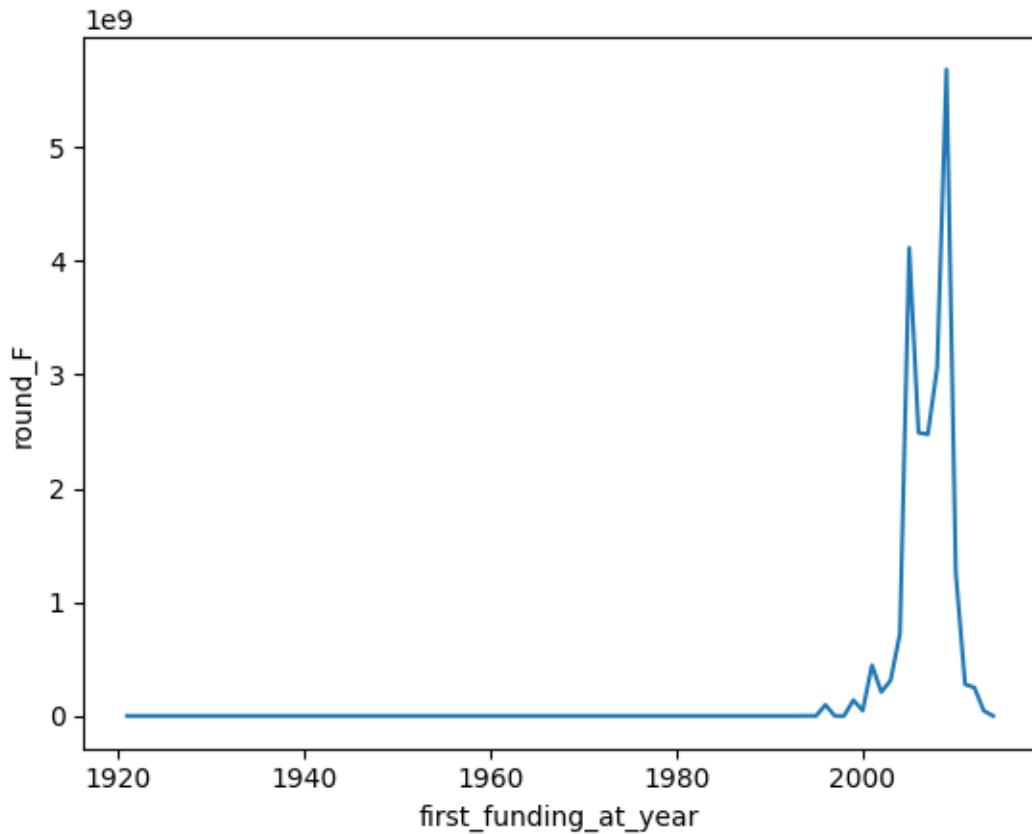
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='round_F'>
```



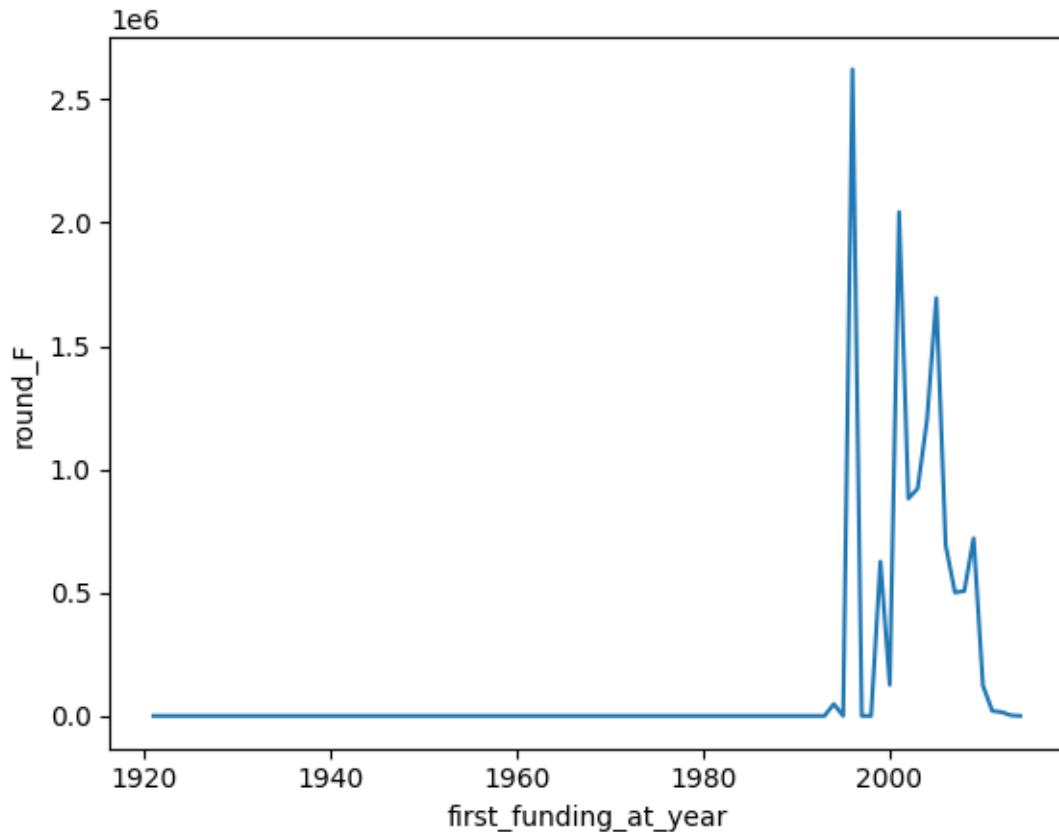
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'sum'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='round_F'>
```



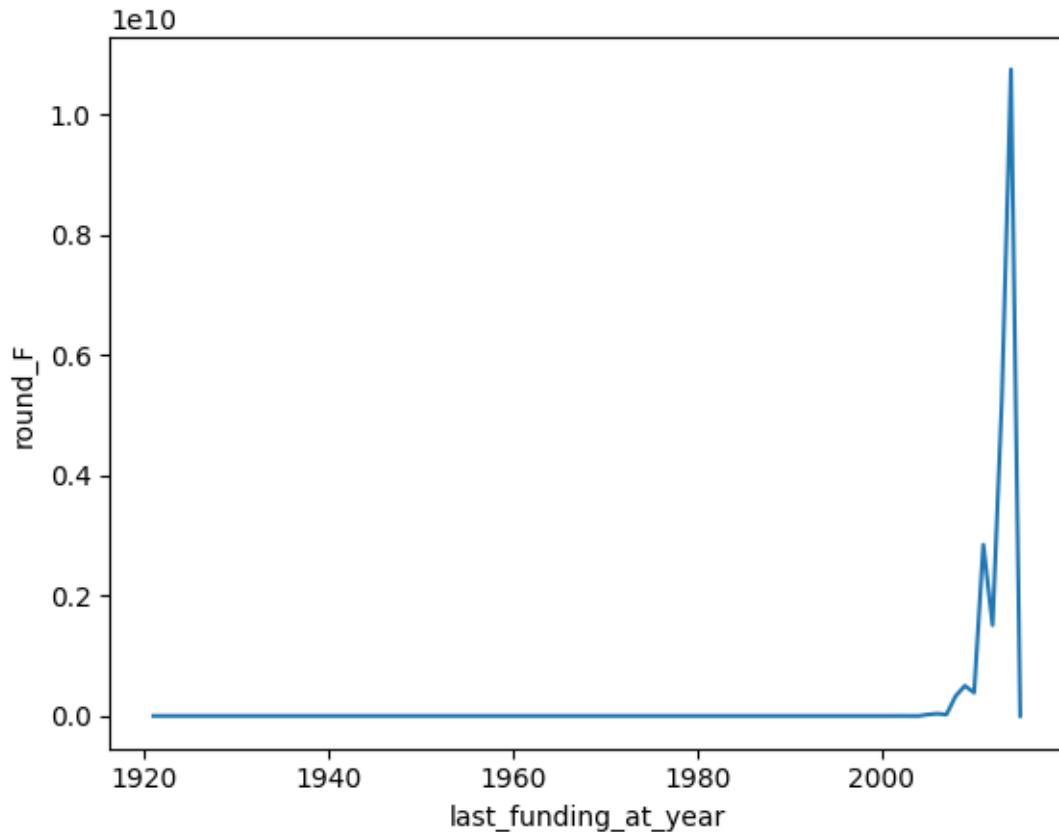
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='round_F'>
```



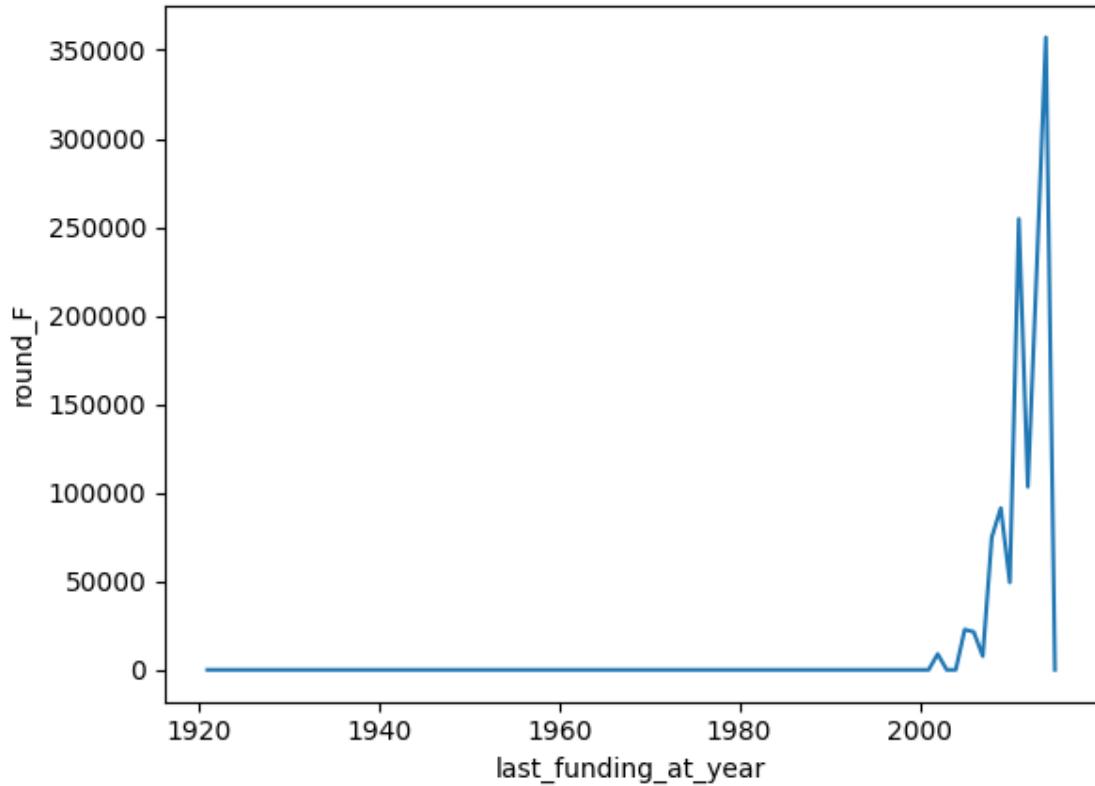
```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='round_F'>
```



```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'mean'}).
      ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='round_F'>
```



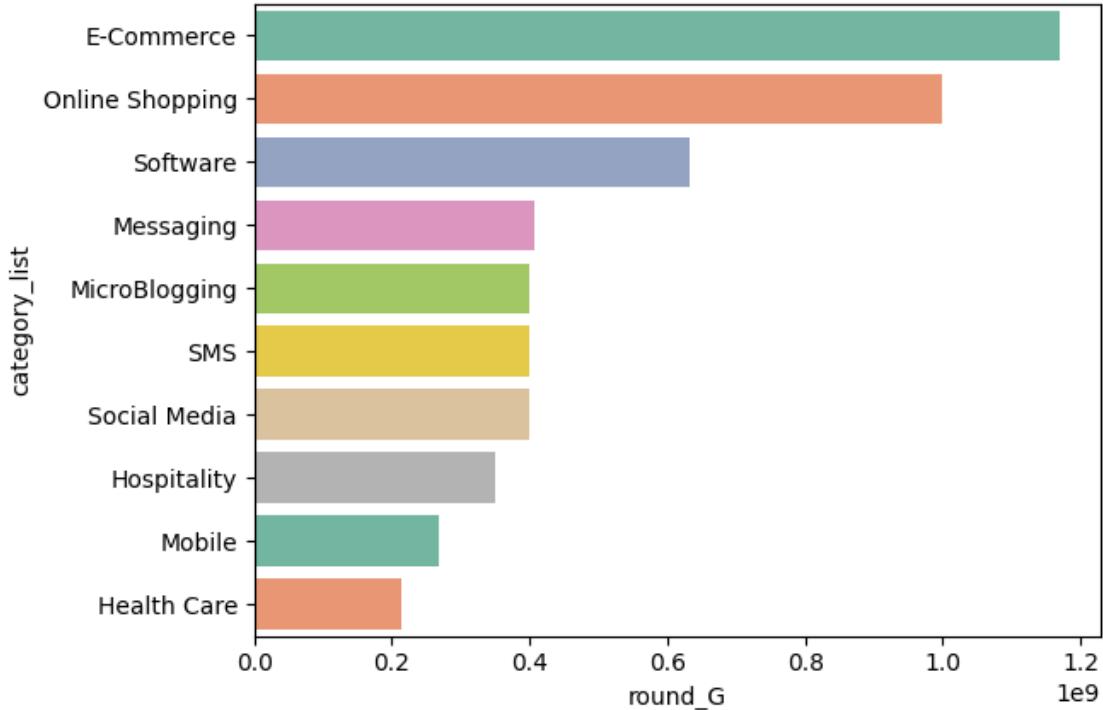
## 1.24 Round\_G

Average and Total Analysis of the Round G Funds as shown below.

```
[ ]: column = 'round_G'

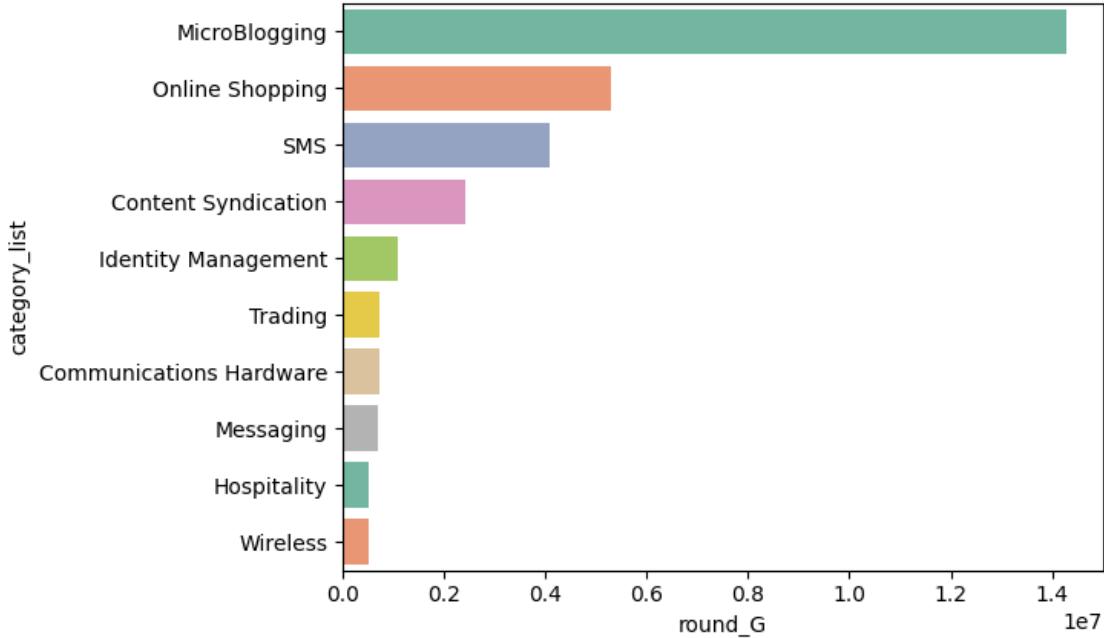
[ ]: df_plot = df_clean.groupby('category_list').agg({column: 'sum'}).reset_index()
     .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')

[ ]: <Axes: xlabel='round_G', ylabel='category_list'>
```



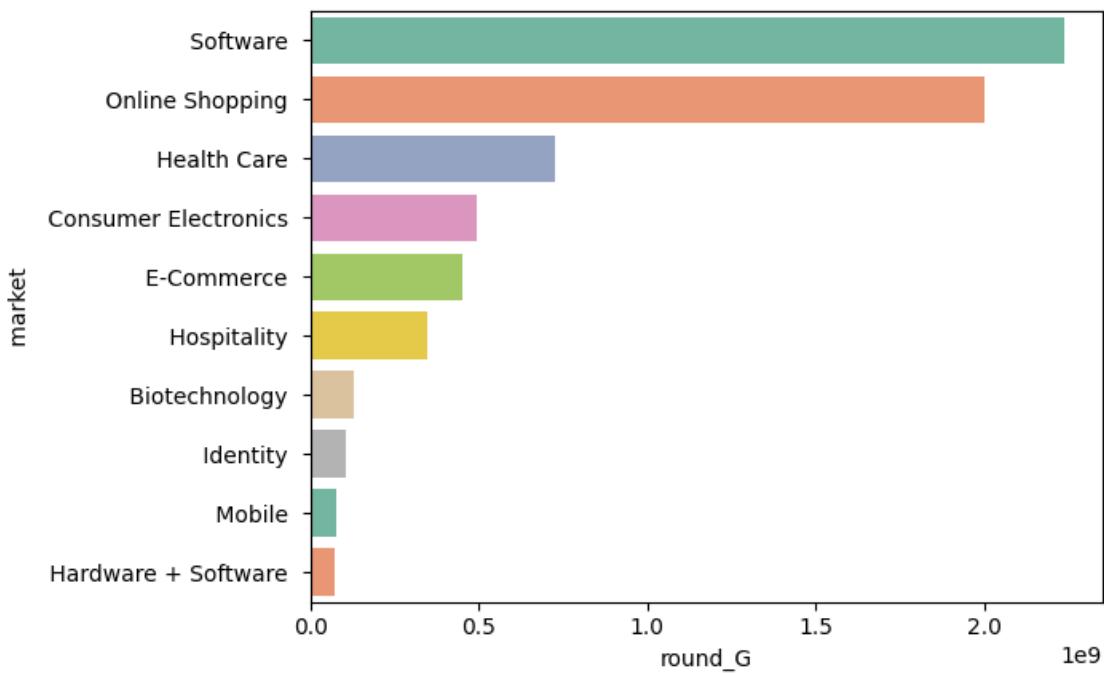
```
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'mean'}).reset_index()  
      .sort_values(column, ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_G', ylabel='category_list'>
```



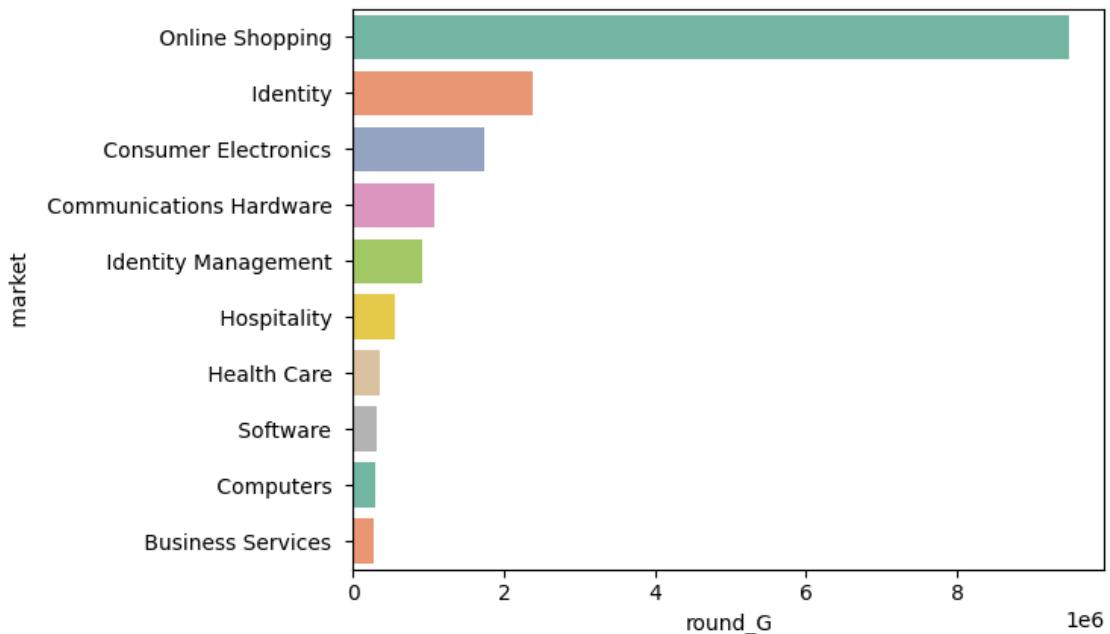
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'sum'}).reset_index()
      ↪sort_values(column,ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='round_G', ylabel=' market '>
```



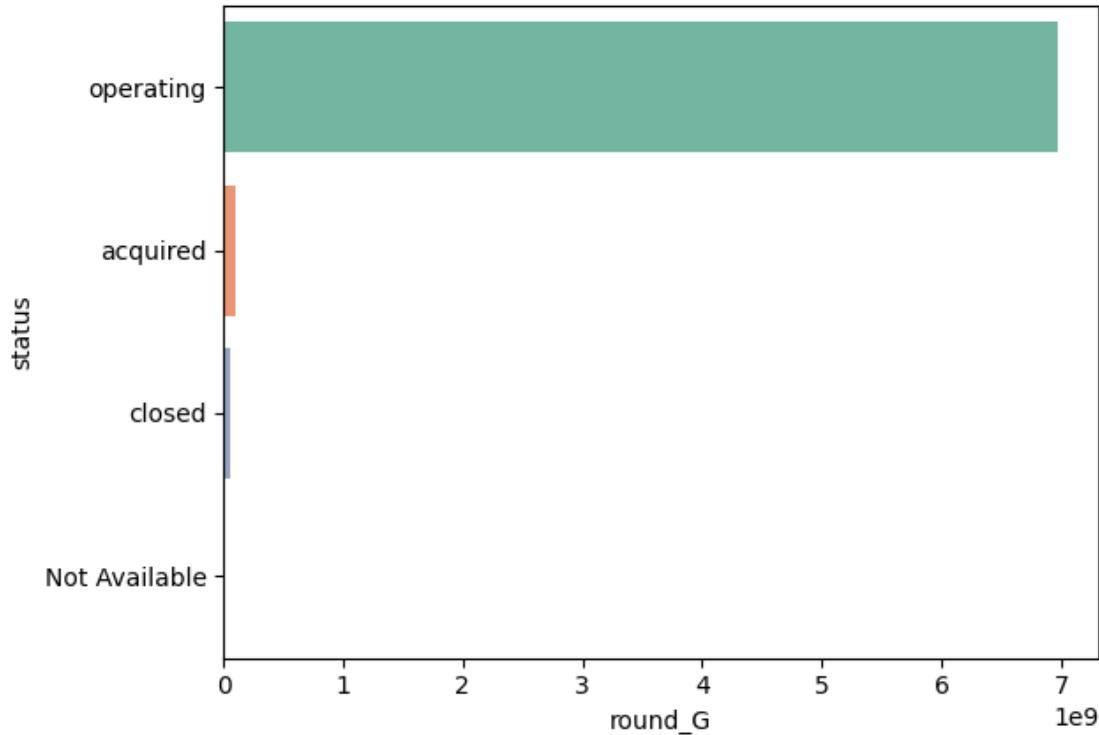
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='round_G', ylabel=' market '>
```



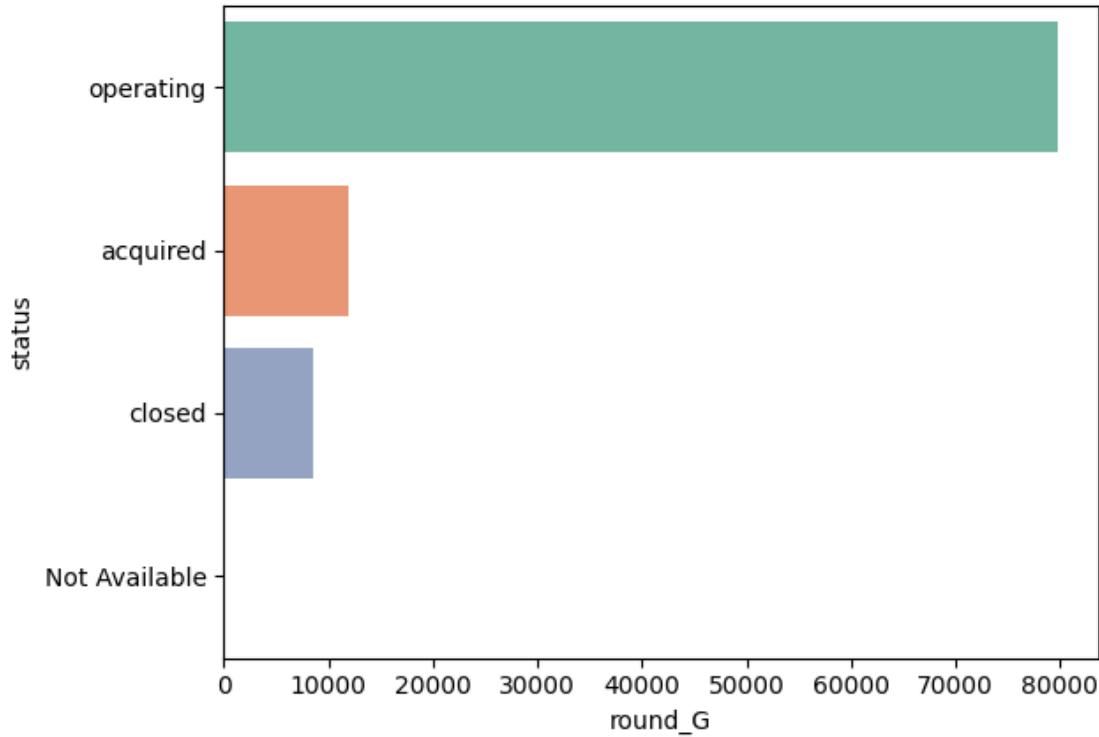
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'sum'}).reset_index() .  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['status'],palette='Set2')
```

```
[ ]: <Axes: xlabel='round_G', ylabel='status'>
```



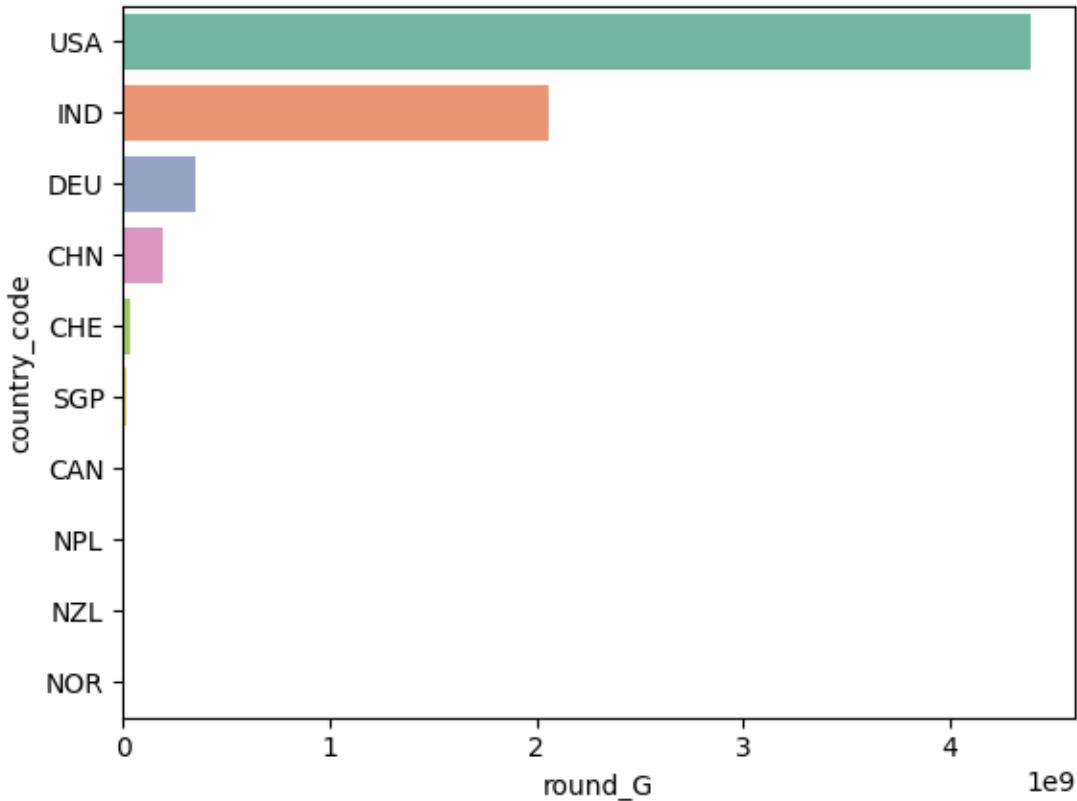
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'mean'}).reset_index()
      .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_G', ylabel='status'>
```



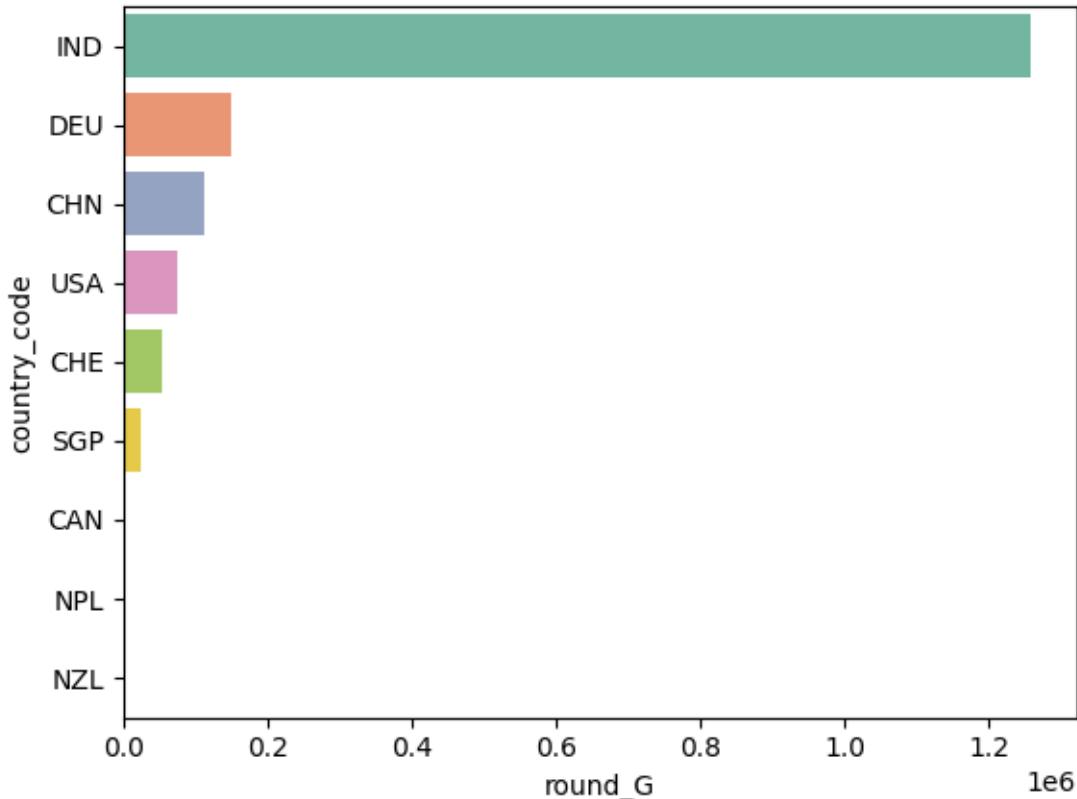
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column,ascending=False).head(11)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_G', ylabel='country_code'>
```



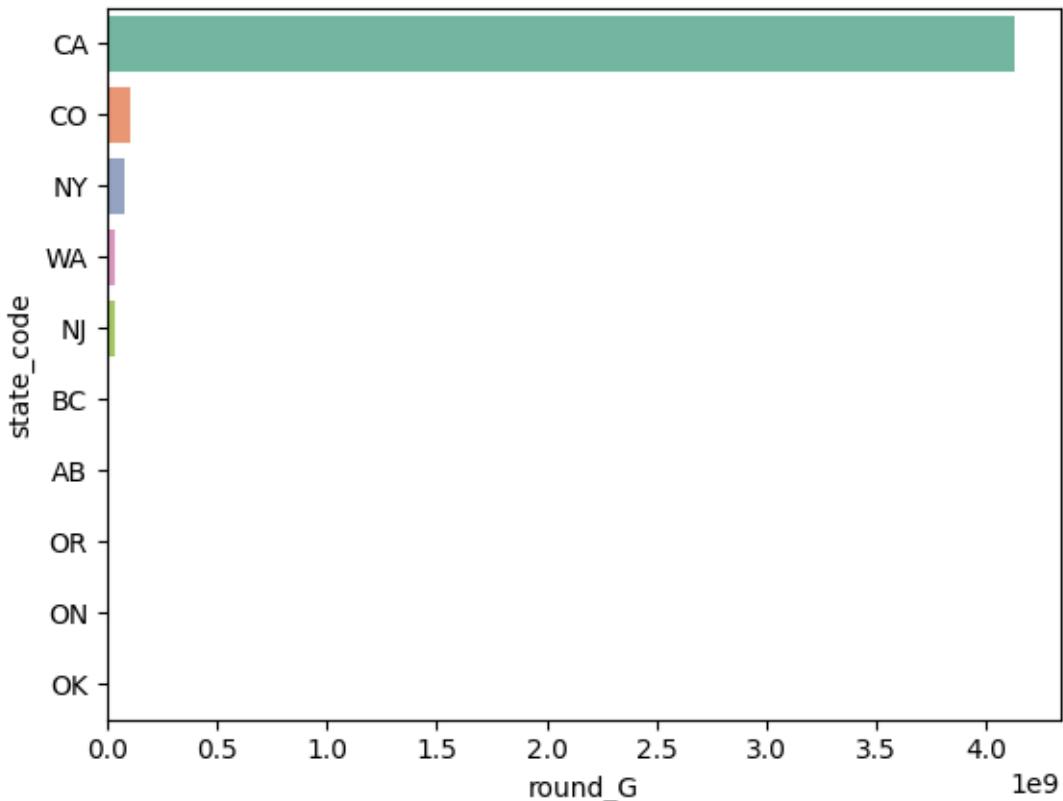
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_G', ylabel='country_code'>
```



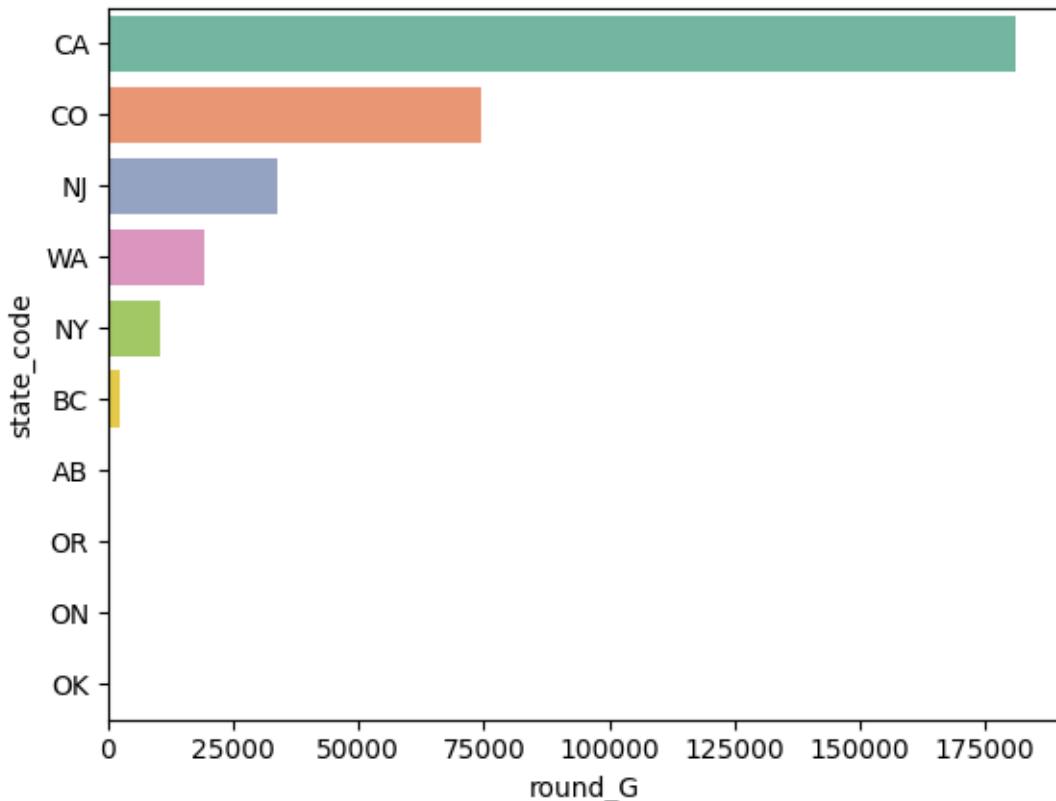
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'sum'}).reset_index()
      ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['state_code']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_G', ylabel='state_code'>
```



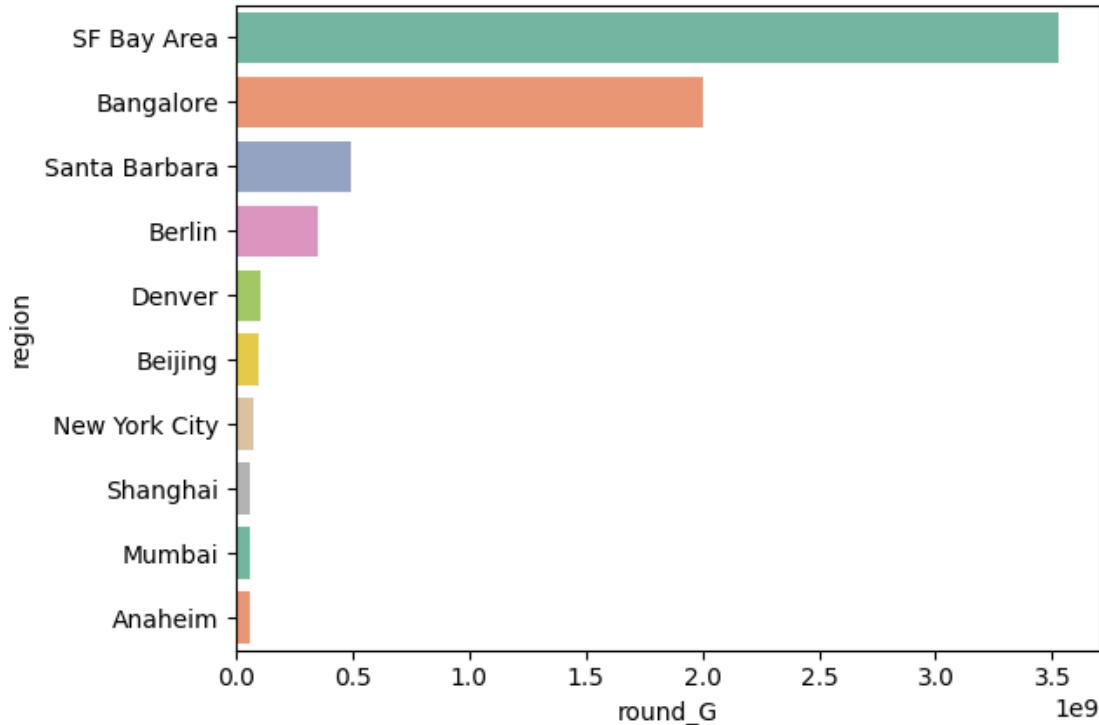
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_G', ylabel='state_code'>
```



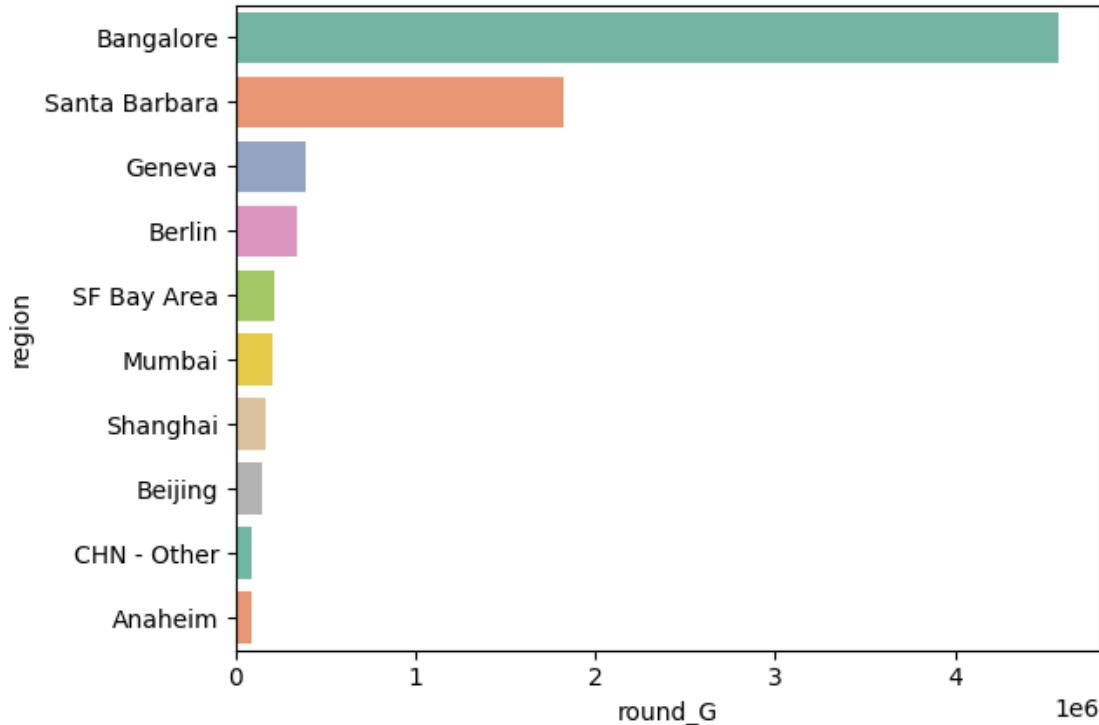
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_G', ylabel='region'>
```



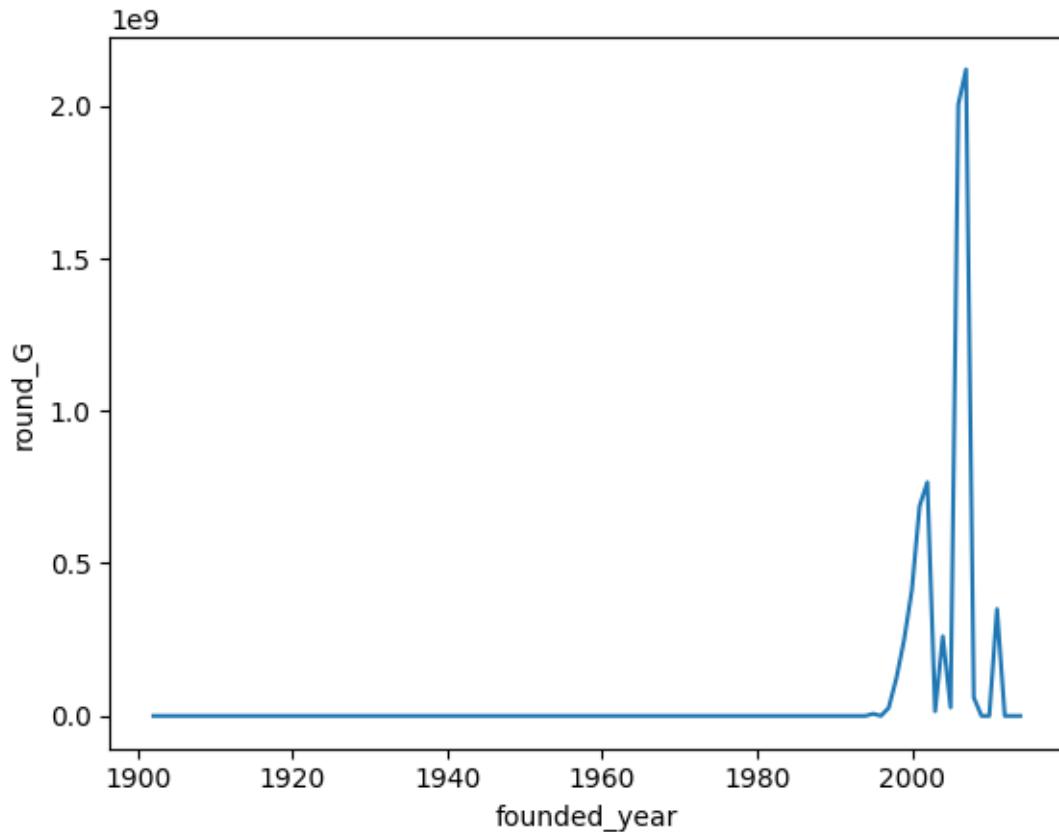
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'mean'}).reset_index()
      .sort_values(column, ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_G', ylabel='region'>
```



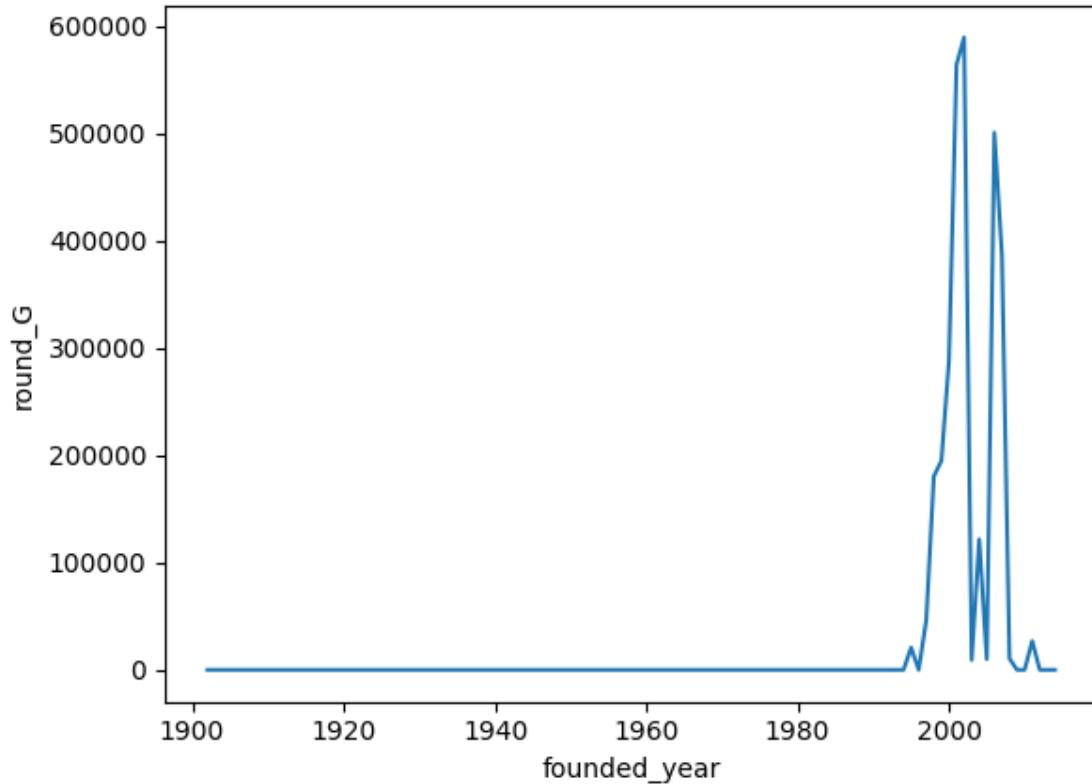
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'sum'}).reset_index().  
    ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='round_G'>
```



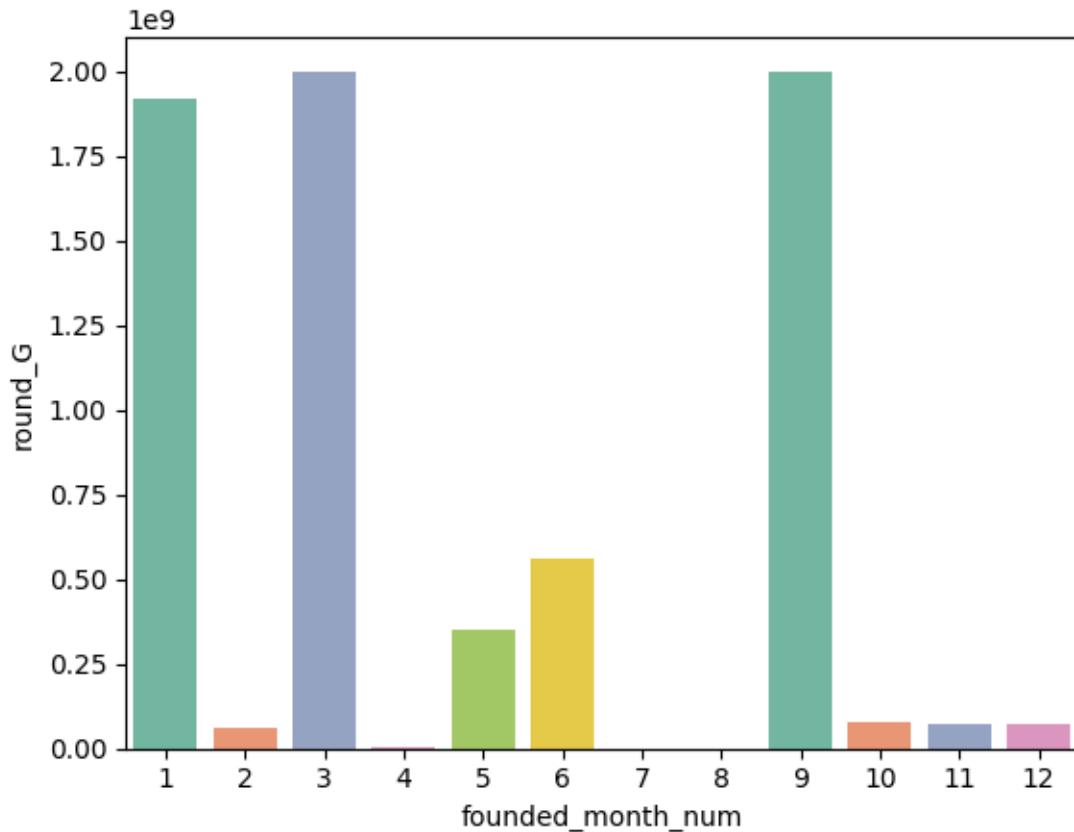
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'mean'}).reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='round_G'>
```



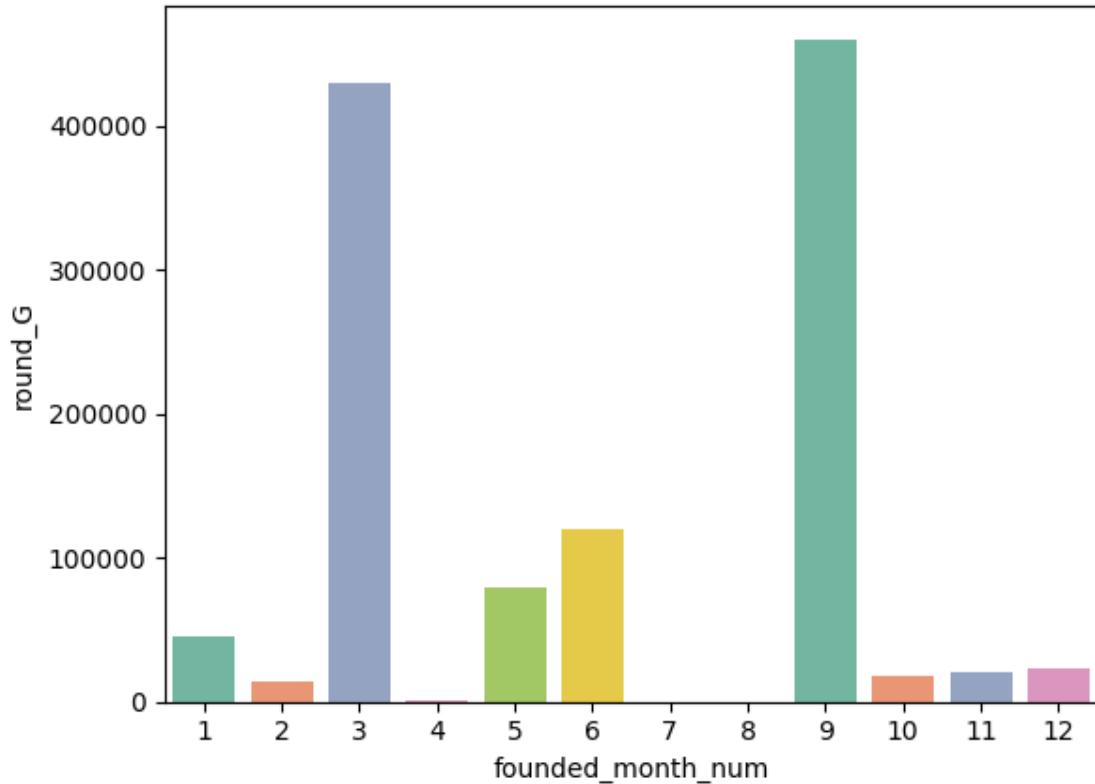
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'sum'}).
    ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='round_G'>
```



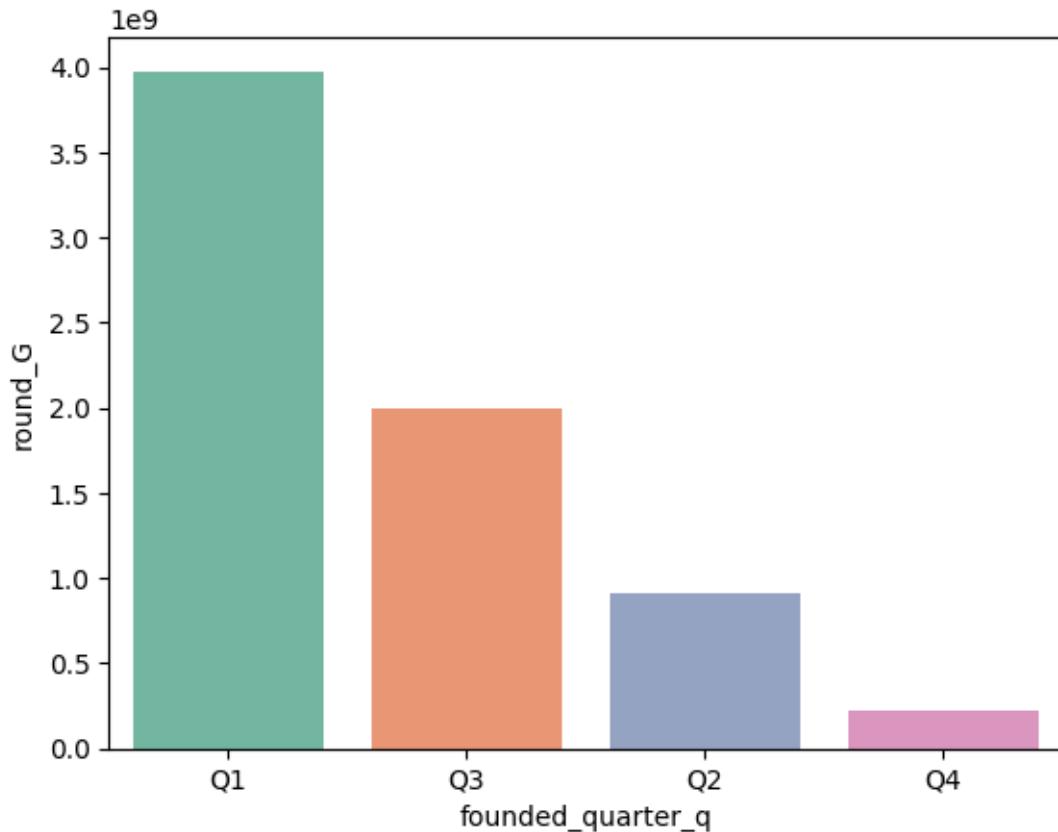
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'mean'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_month_num'] > 0]  
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='round_G'>
```



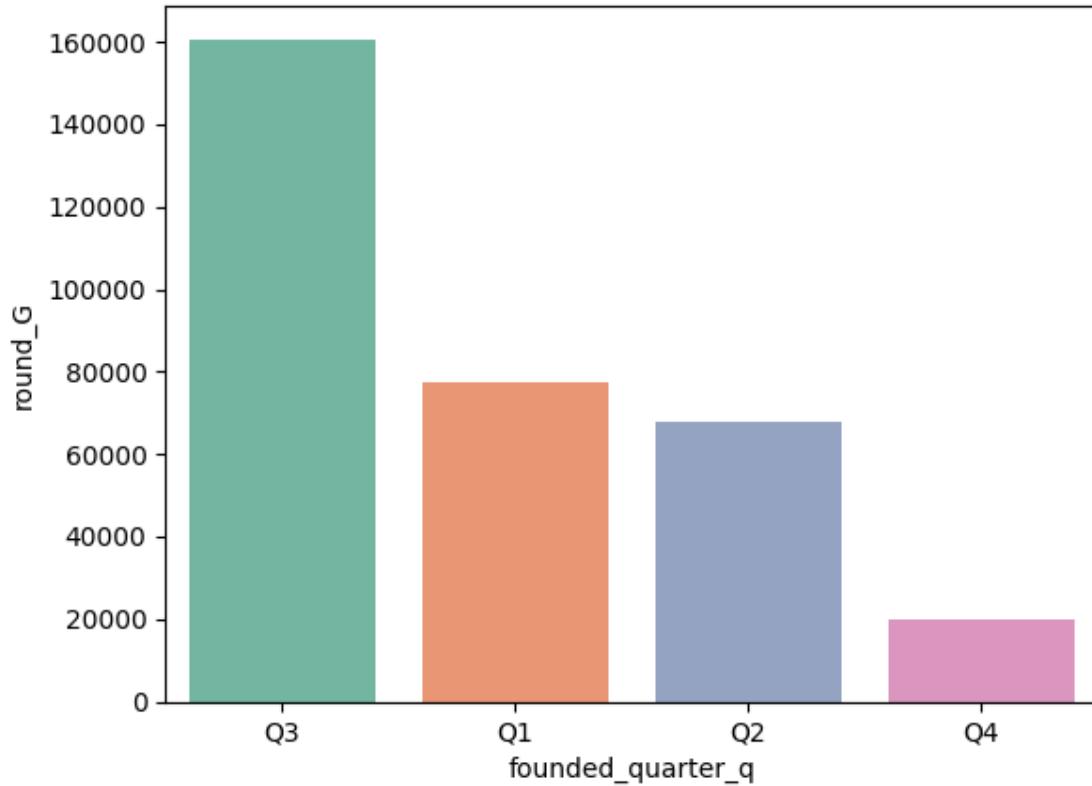
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'sum'}).
    ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q']!='Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')

[ ]: <Axes: xlabel='founded_quarter_q', ylabel='round_G'>
```



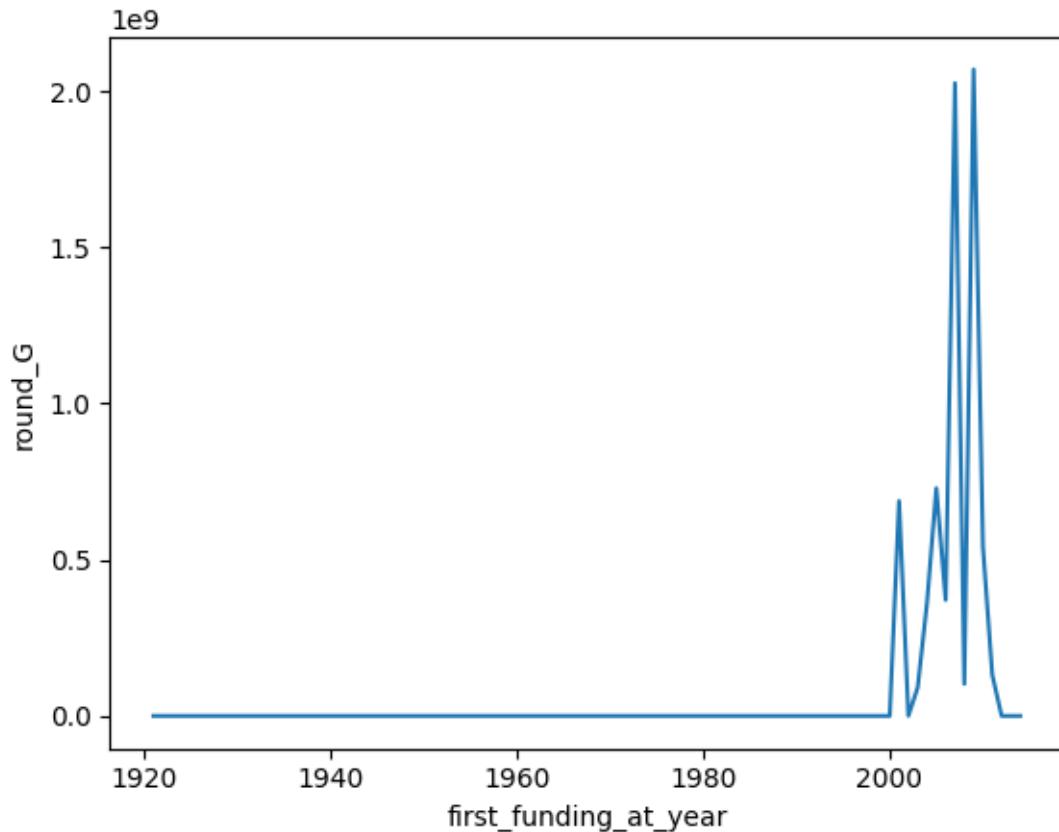
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'mean'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']  
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='round_G'>
```



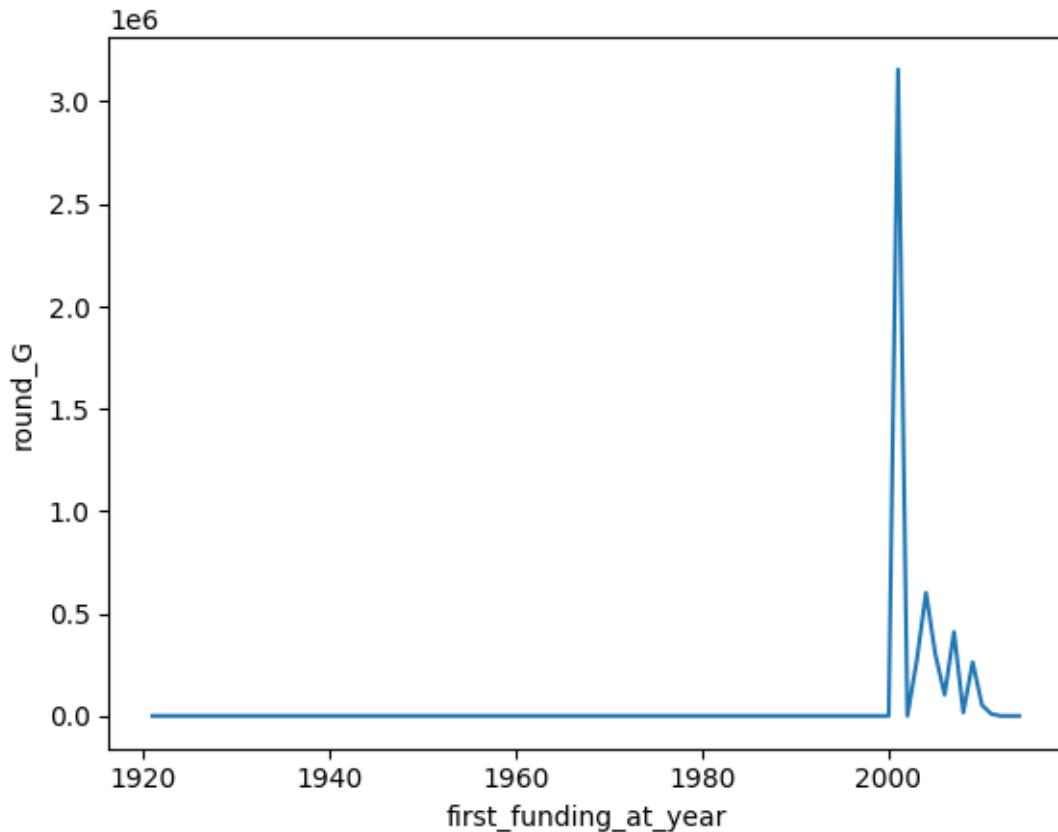
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='round_G'>
```



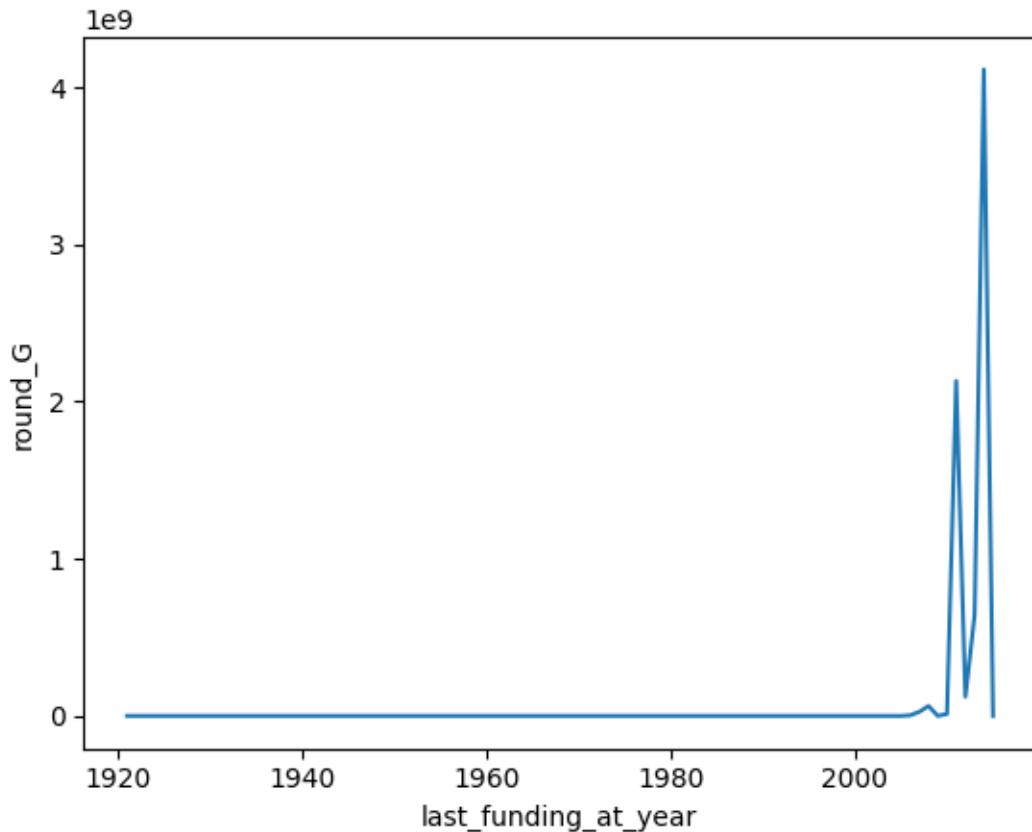
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='round_G'>
```



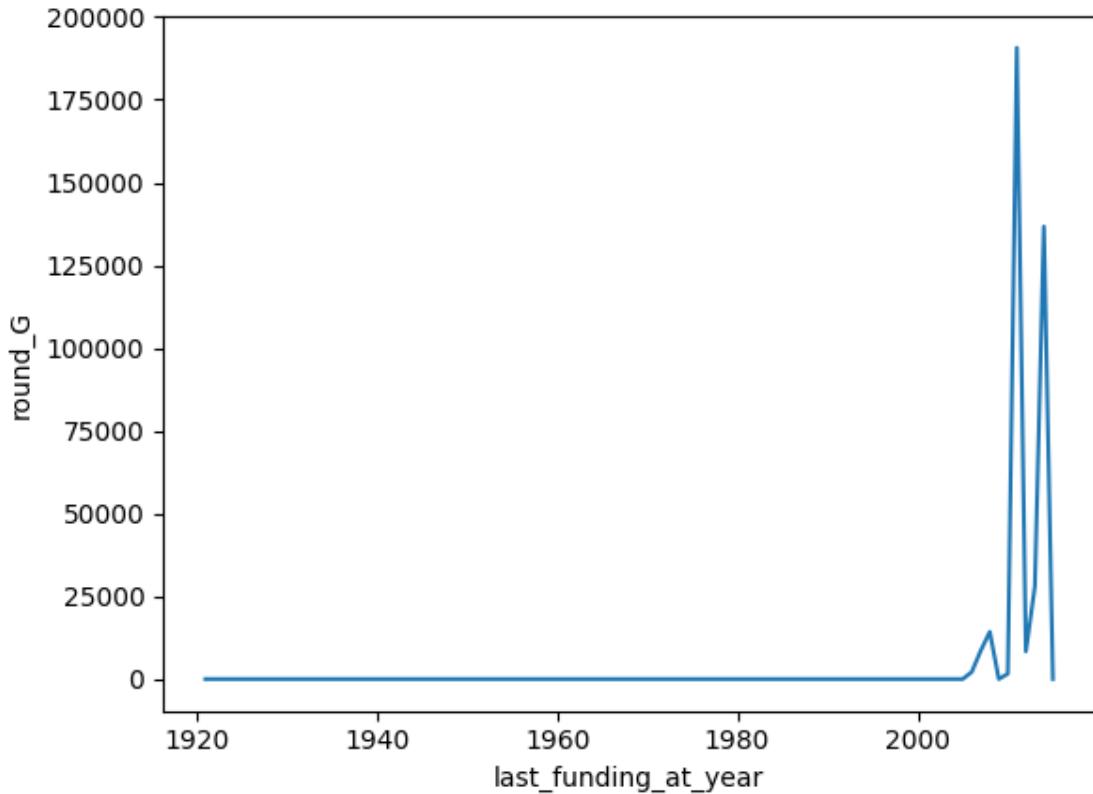
```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='round_G'>
```



```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='round_G'>
```



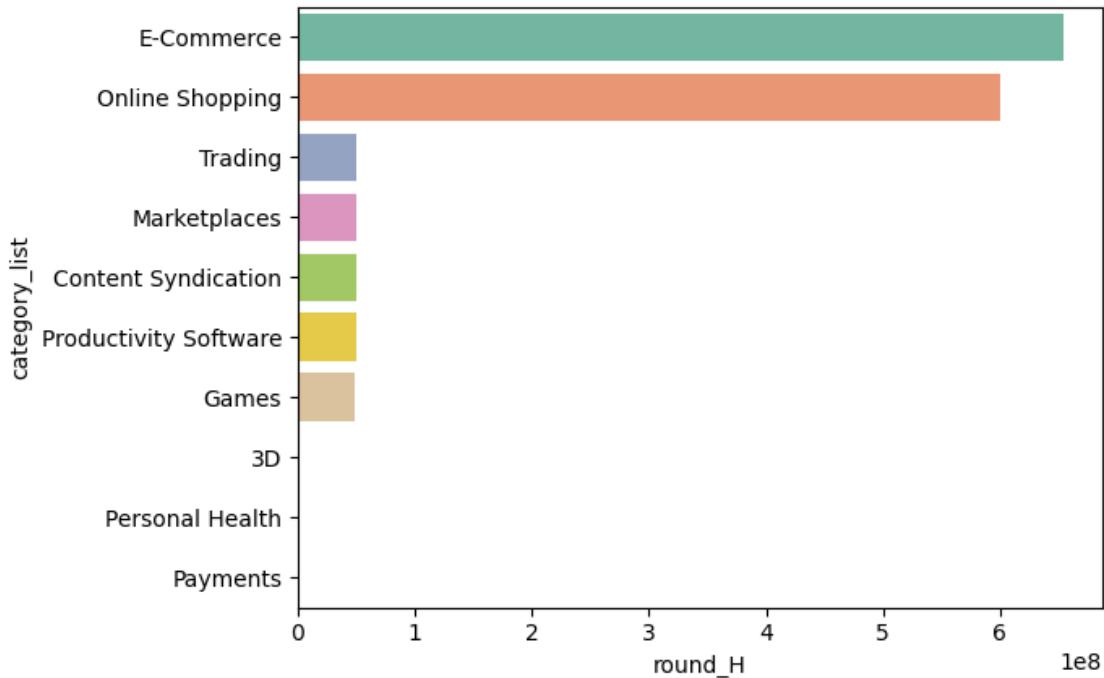
## 1.25 Round\_H

Average and Total Analysis of the Round H Funds as shown below.

```
[ ]: column = 'round_H'

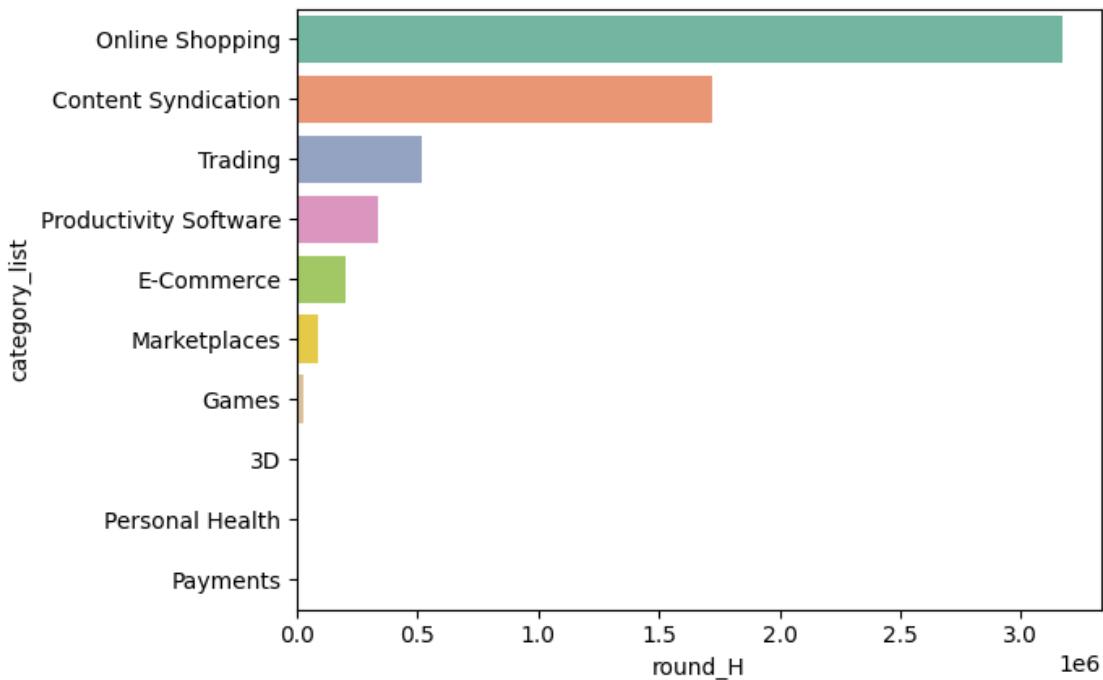
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')

[ ]: <Axes: xlabel='round_H', ylabel='category_list'>
```



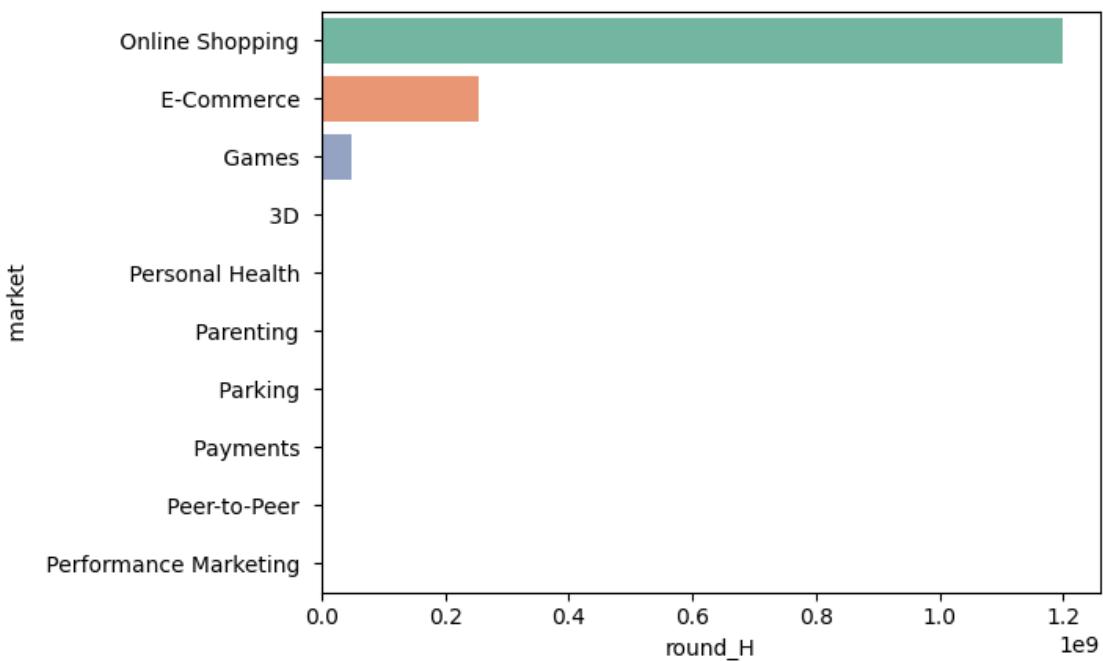
```
[ ]: df_plot = df_clean.groupby('category_list').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['category_list'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_H', ylabel='category_list'>
```



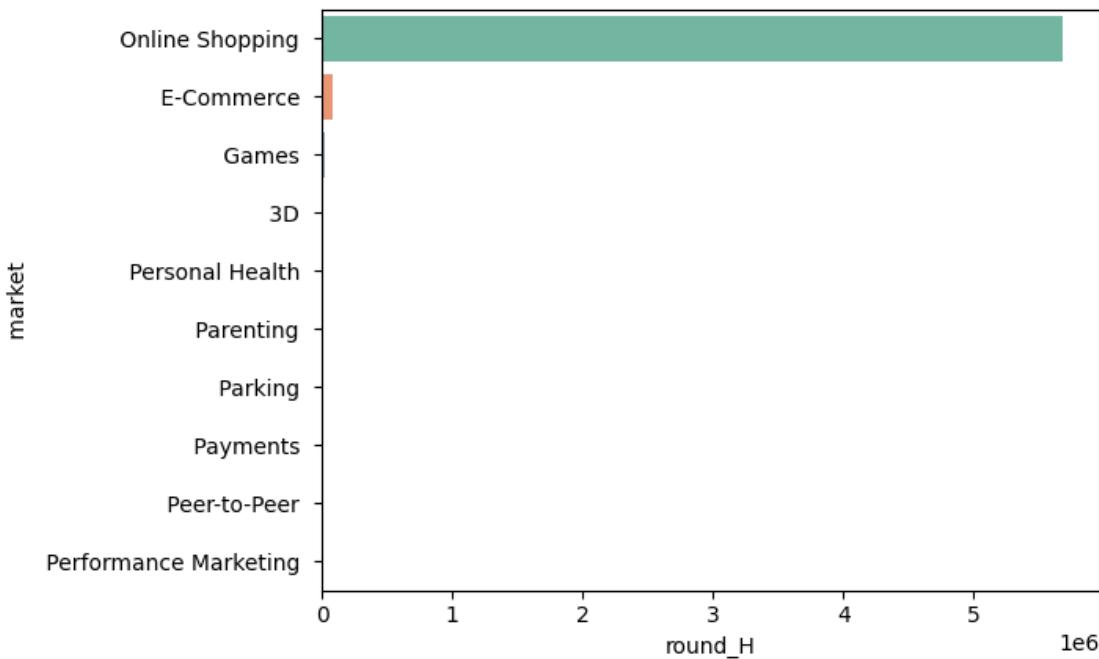
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'sum'}).reset_index()
      ↪sort_values(column,ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot[' market '],palette='Set2')
```

```
[ ]: <Axes: xlabel='round_H', ylabel=' market '>
```



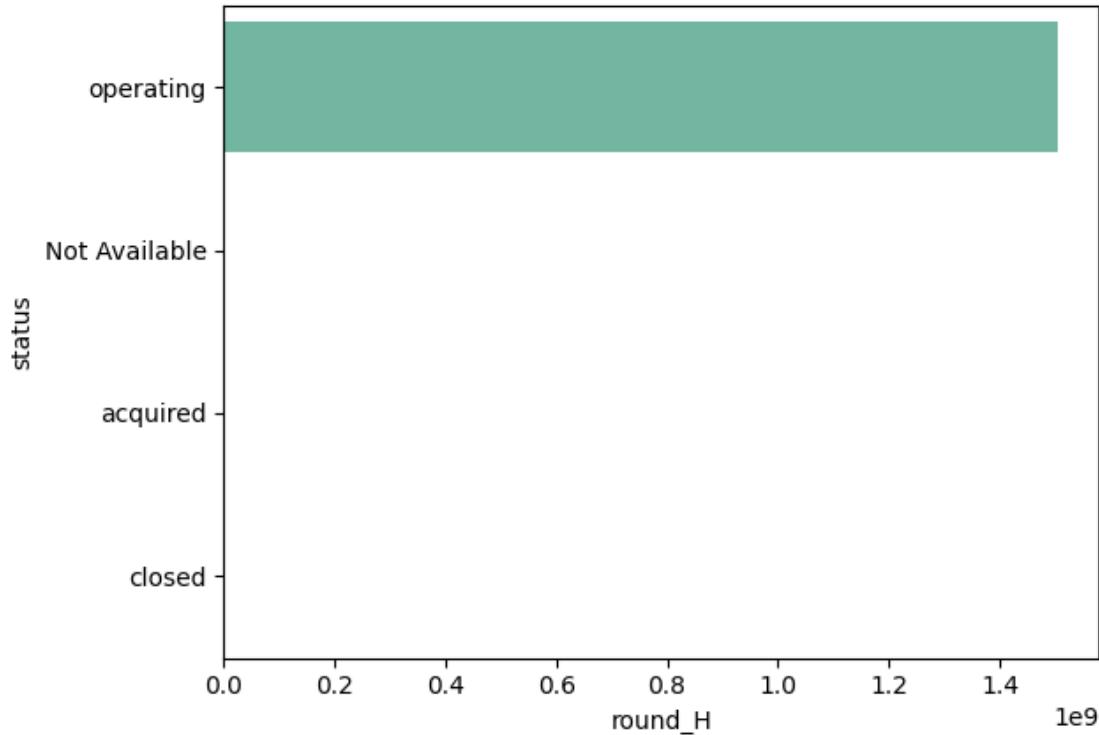
```
[ ]: df_plot = df_clean.groupby(' market ').agg({column:'mean'}).reset_index().  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot[' market '], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_H', ylabel=' market '>
```



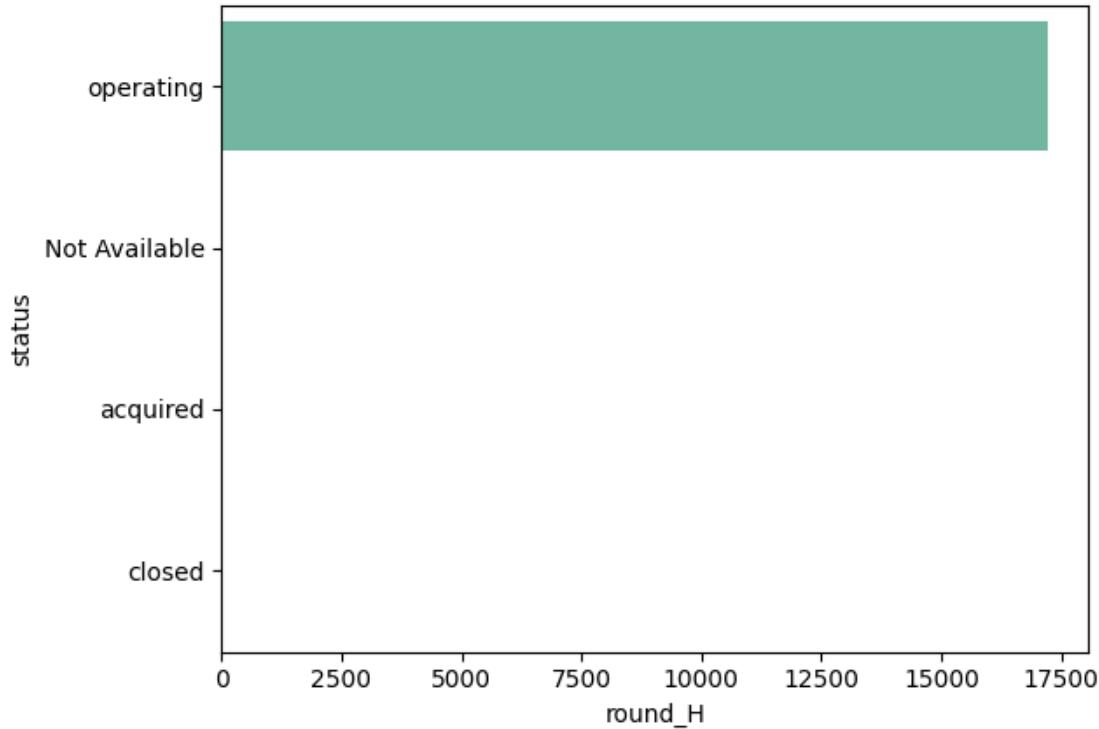
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'sum'}).reset_index().  
    ↪sort_values(column,ascending=False).head(10)  
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_H', ylabel='status'>
```



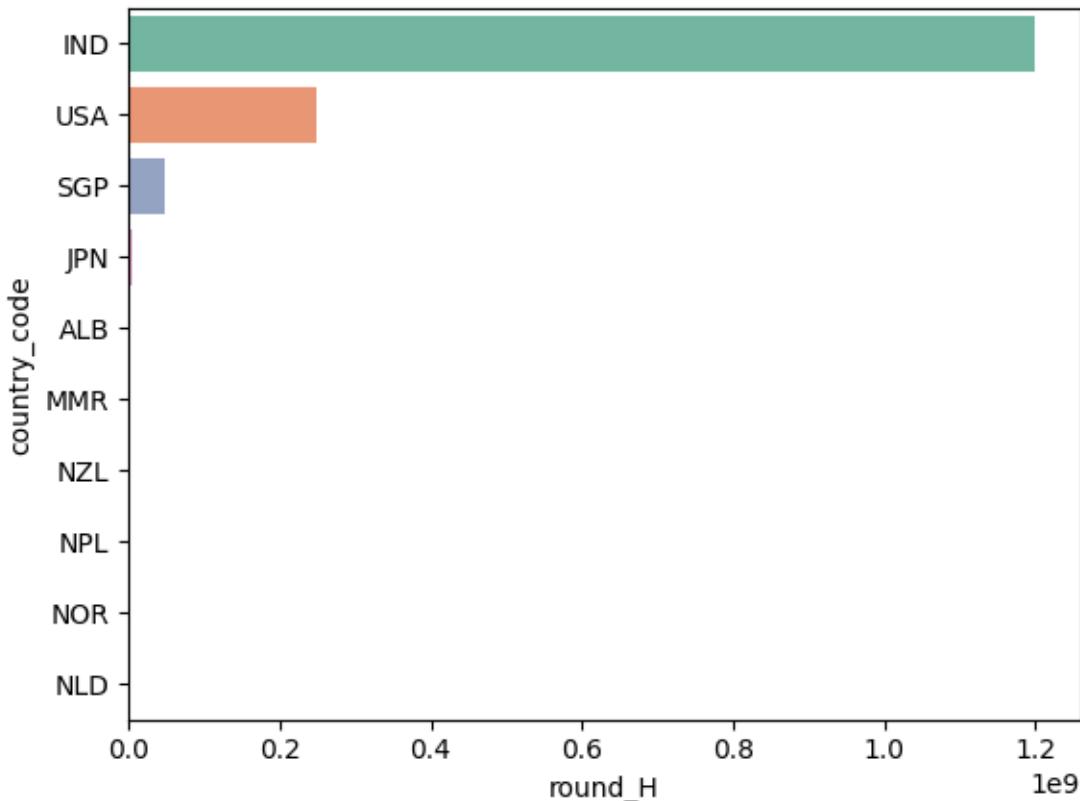
```
[ ]: df_plot = df_clean.groupby('status').agg({column:'mean'}).reset_index()
      .sort_values(column, ascending=False).head(10)
sns.barplot(x=df_plot[column], y=df_plot['status'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_H', ylabel='status'>
```



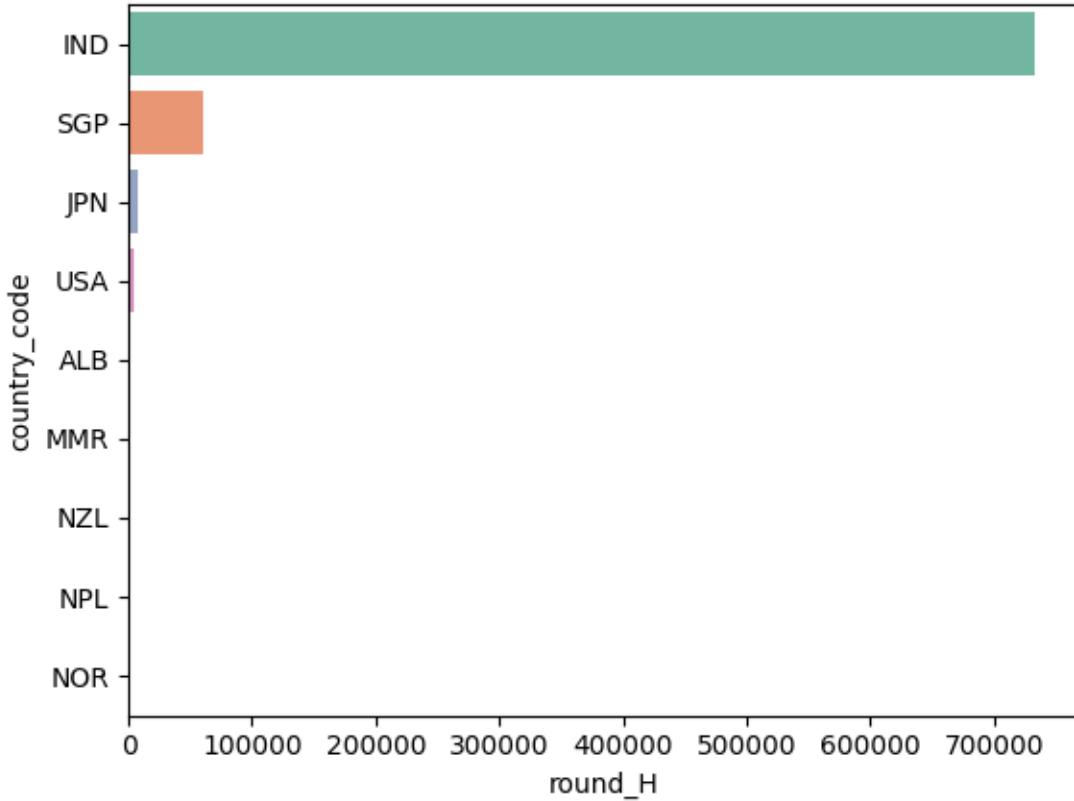
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_H', ylabel='country_code'>
```



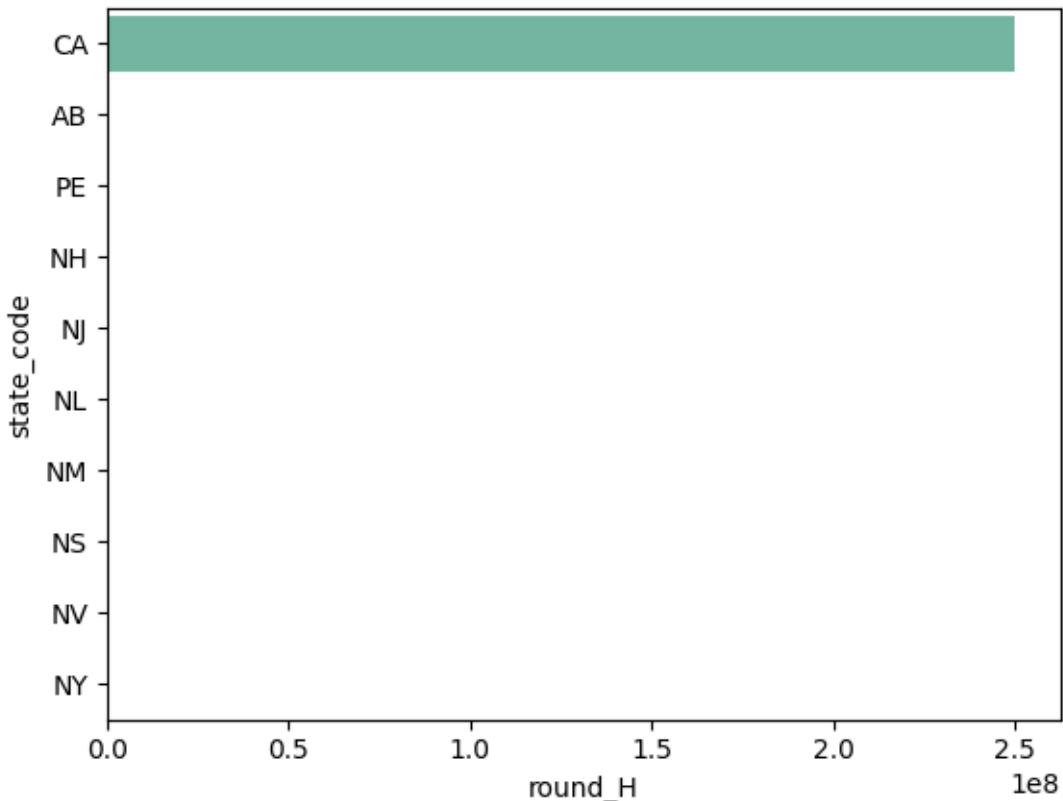
```
[ ]: df_plot = df_clean.groupby('country_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(10)  
df_plot = df_plot[df_plot['country_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['country_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_H', ylabel='country_code'>
```



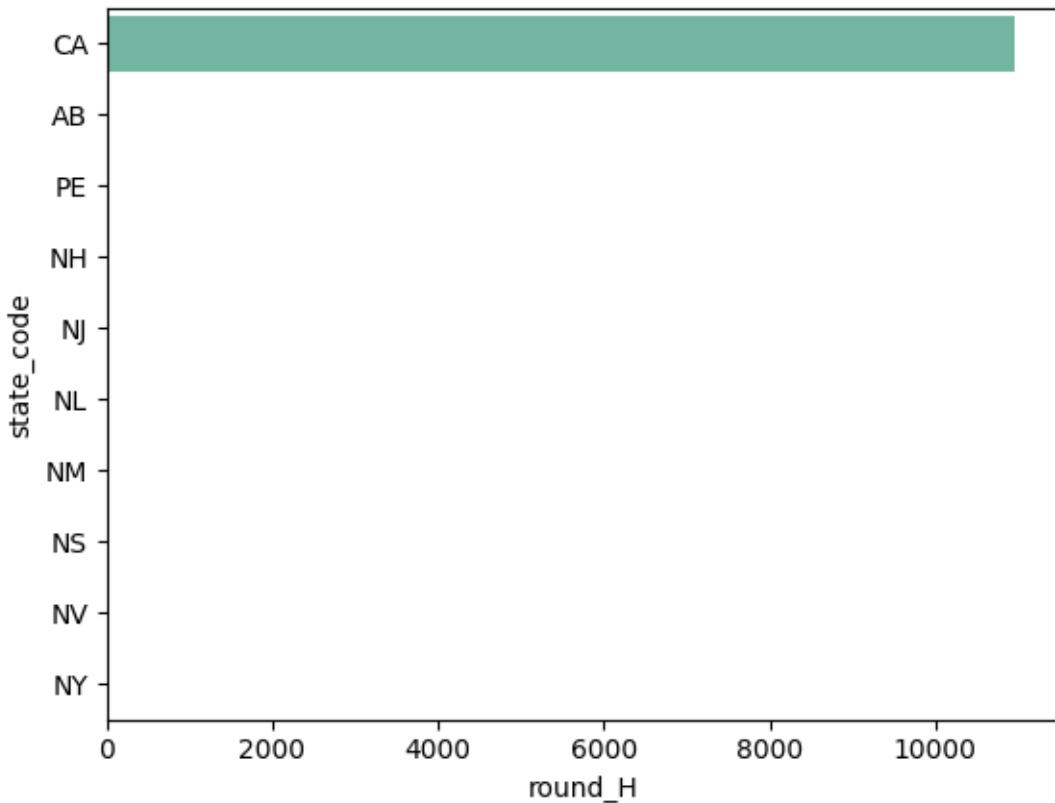
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'sum'}).reset_index().  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_H', ylabel='state_code'>
```



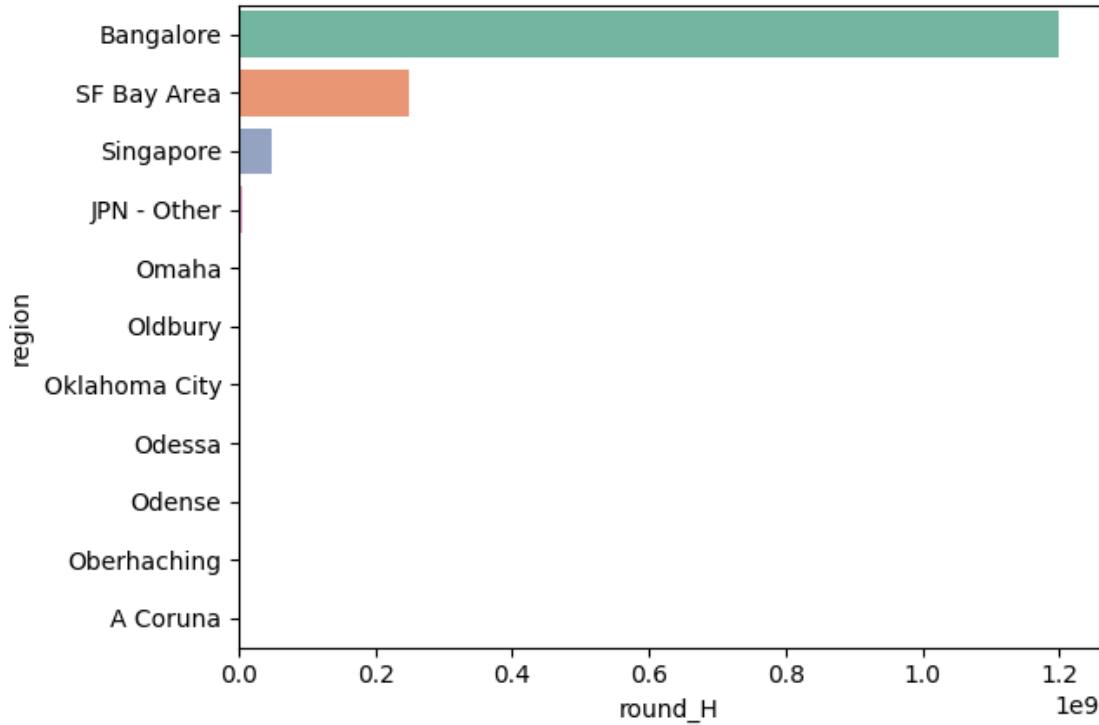
```
[ ]: df_plot = df_clean.groupby('state_code').agg({column:'mean'}).reset_index() .  
    ↪sort_values(column, ascending=False).head(11)  
df_plot = df_plot[df_plot['state_code']!='Not Available']  
sns.barplot(x=df_plot[column], y=df_plot['state_code'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_H', ylabel='state_code'>
```



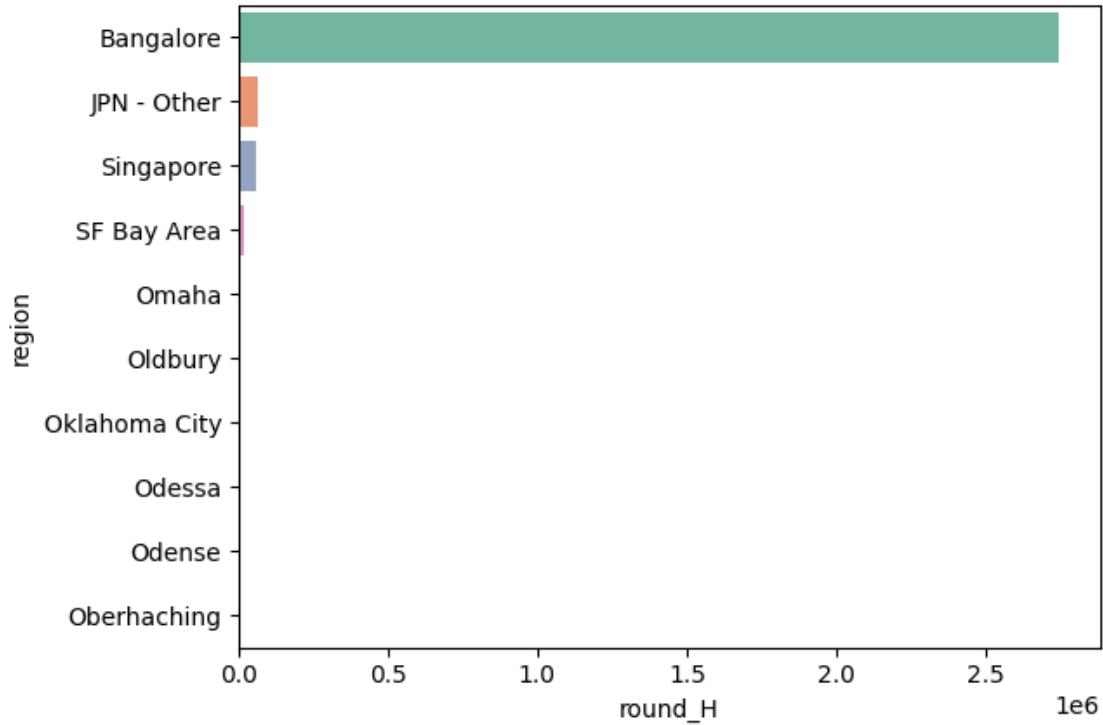
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'sum'}).reset_index() .
    ↪sort_values(column, ascending=False).head(11)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_H', ylabel='region'>
```



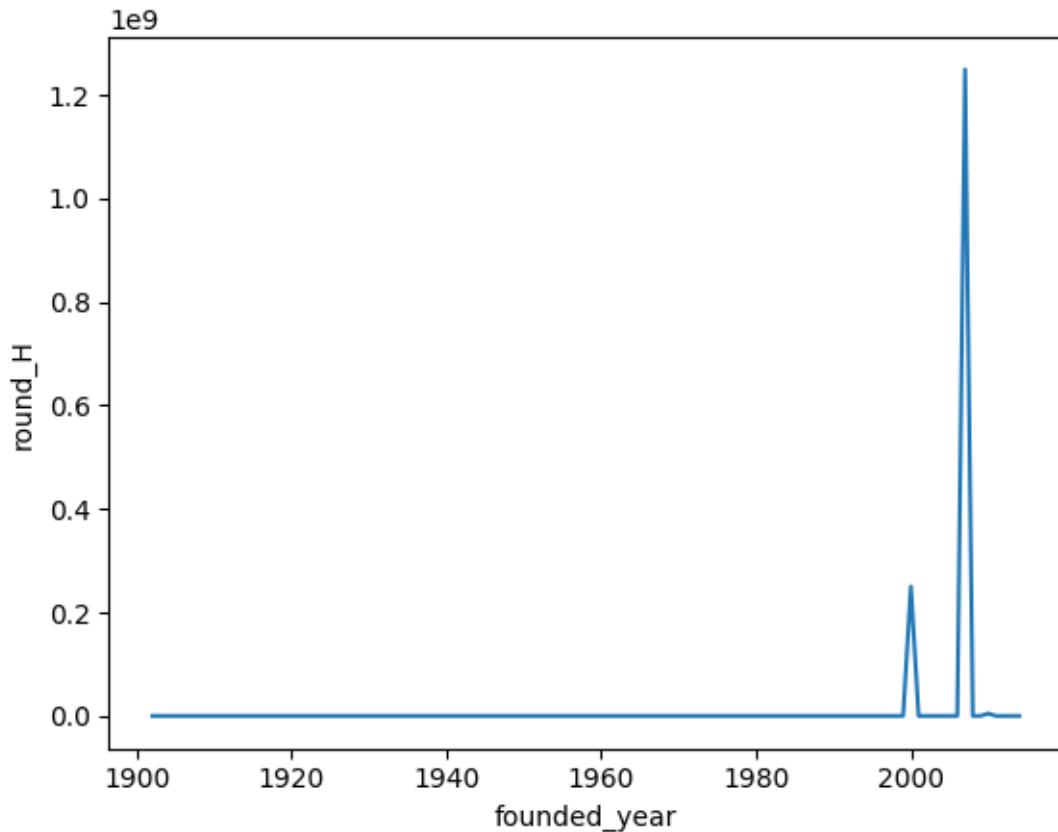
```
[ ]: df_plot = df_clean.groupby('region').agg({column:'mean'}).reset_index()
      ↪sort_values(column, ascending=False).head(10)
df_plot = df_plot[df_plot['region']!='Not Available']
sns.barplot(x=df_plot[column], y=df_plot['region'], palette='Set2')
```

```
[ ]: <Axes: xlabel='round_H', ylabel='region'>
```



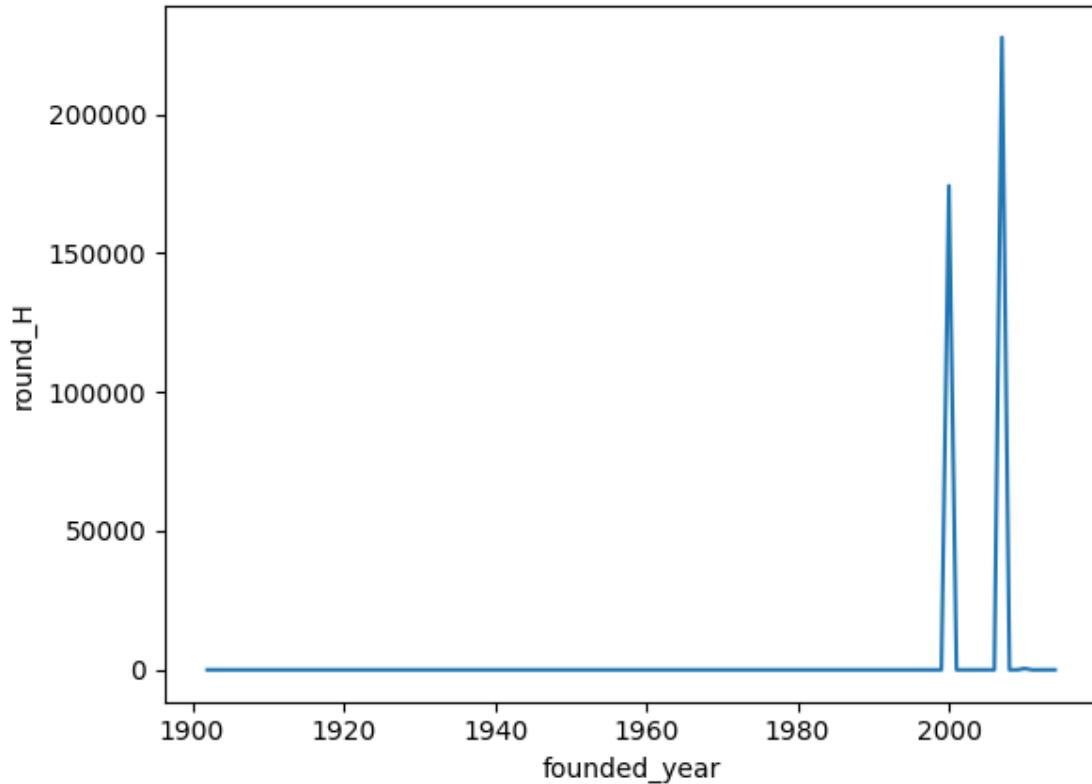
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'sum'}).reset_index().  
    ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='round_H'>
```



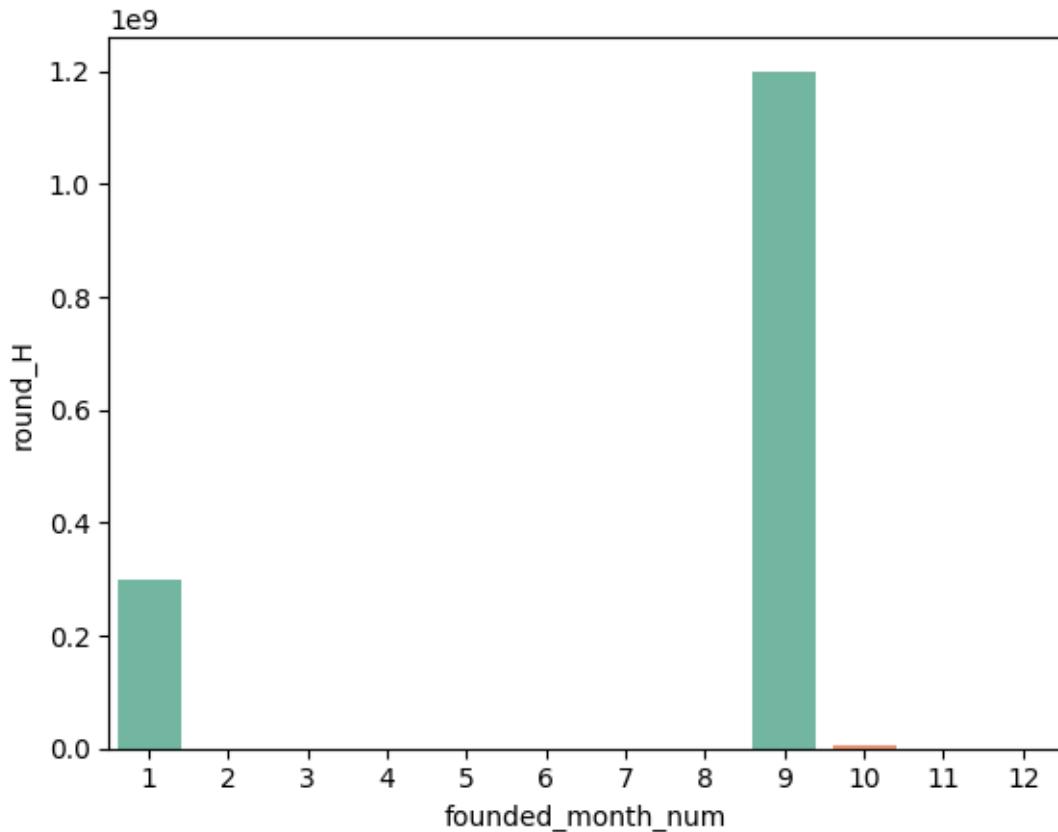
```
[ ]: df_plot = df_clean.groupby('founded_year').agg({column:'mean'}).reset_index().  
      ↪sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['founded_year'])
```

```
[ ]: <Axes: xlabel='founded_year', ylabel='round_H'>
```



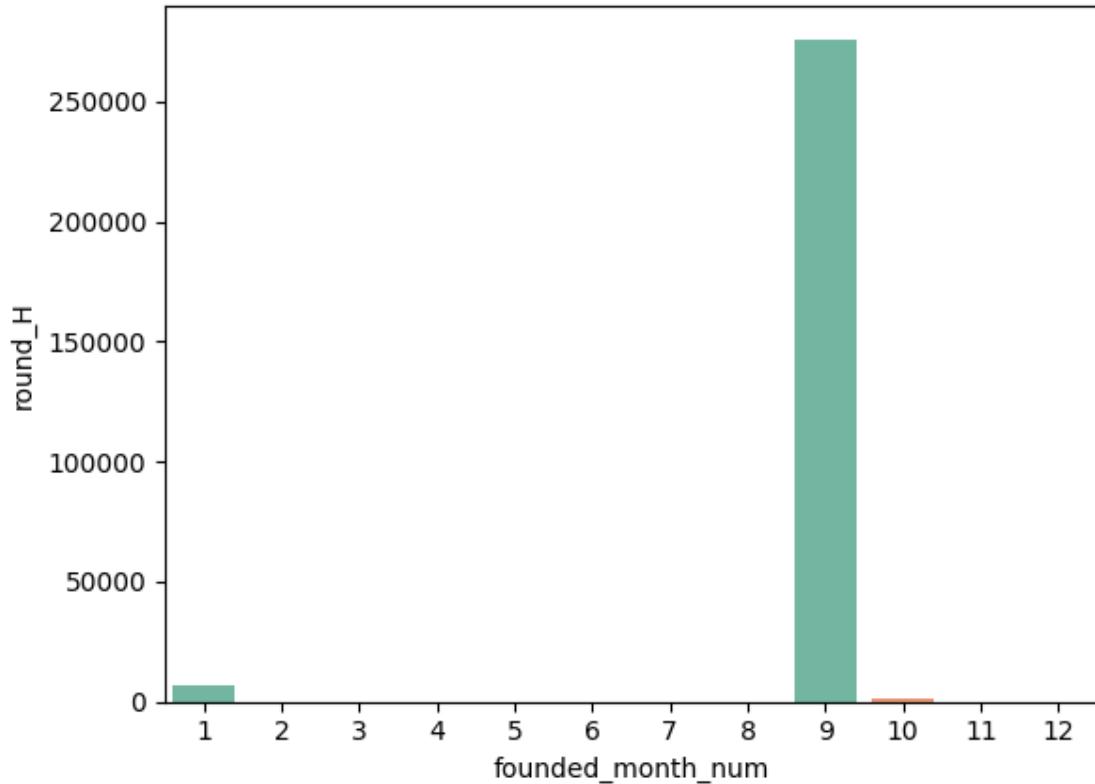
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'sum'}).
    ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['founded_month_num'] > 0]
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='round_H'>
```



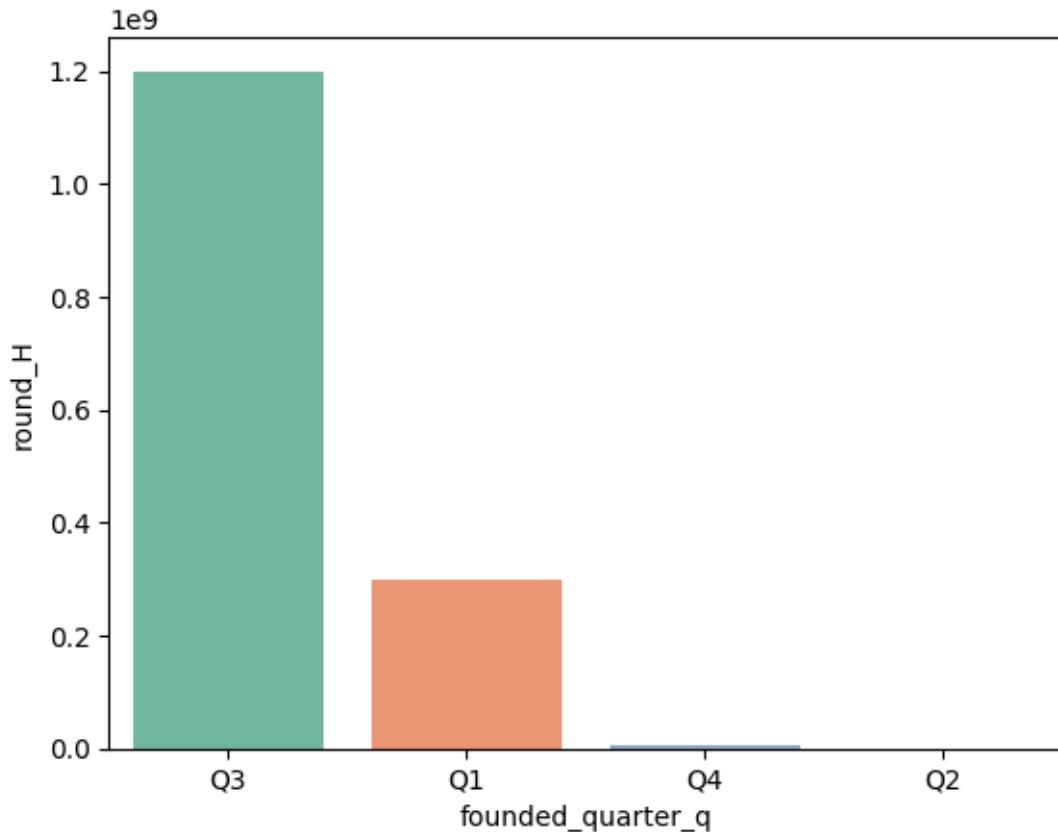
```
[ ]: df_plot = df_clean.groupby('founded_month_num').agg({column:'mean'})  
     .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['founded_month_num'] > 0]  
sns.barplot(y=df_plot[column], x=df_plot['founded_month_num'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_month_num', ylabel='round_H'>
```



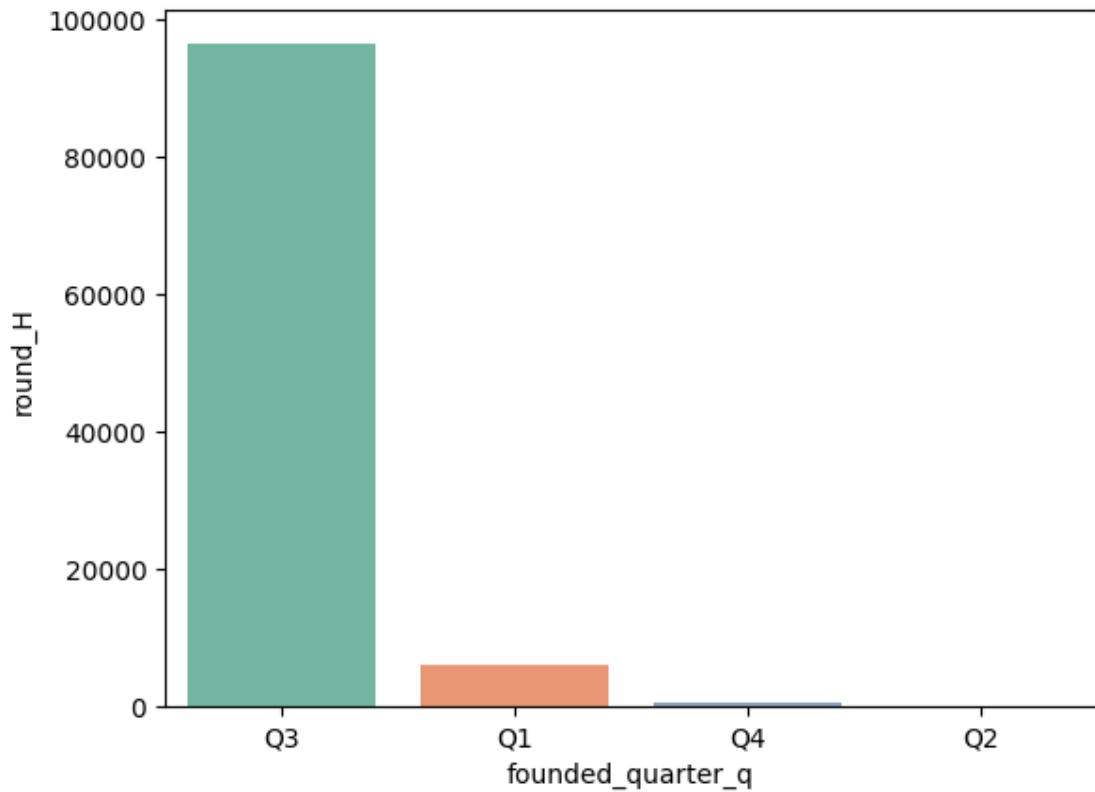
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'sum'}).
    ↪reset_index().sort_values(column,ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q']!='Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='round_H'>
```



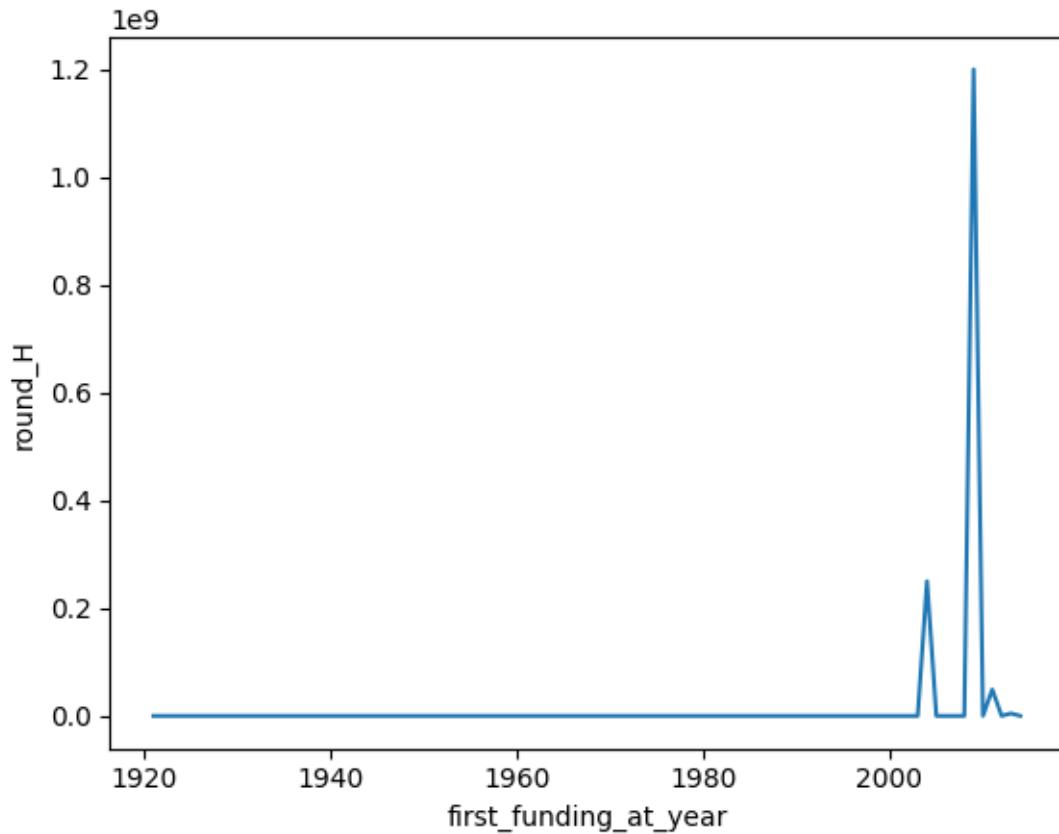
```
[ ]: df_plot = df_clean.groupby('founded_quarter_q').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['founded_quarter_q'] != 'Q0']
sns.barplot(y=df_plot[column], x=df_plot['founded_quarter_q'], palette='Set2')
```

```
[ ]: <Axes: xlabel='founded_quarter_q', ylabel='round_H'>
```



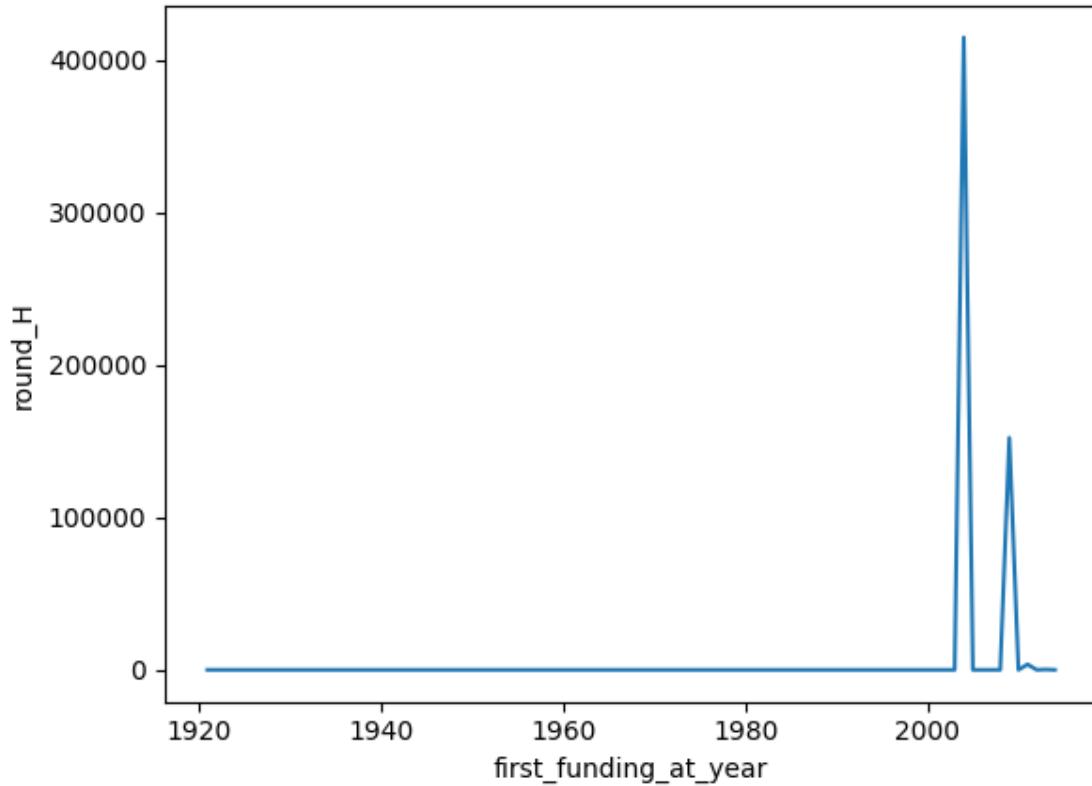
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'sum'})  
    .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='round_H'>
```



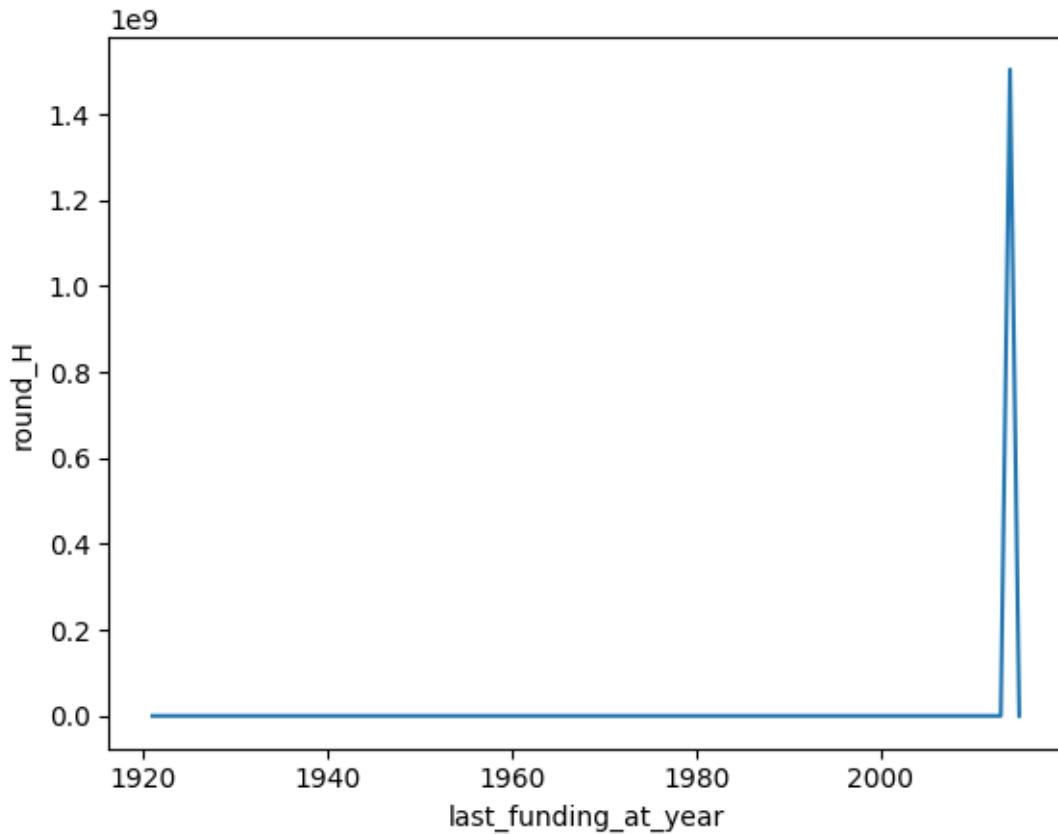
```
[ ]: df_plot = df_clean.groupby('first_funding_at_year').agg({column:'mean'}).
    ↪reset_index().sort_values(column, ascending=False)
df_plot = df_plot[df_plot['first_funding_at_year'] > 1000]
sns.lineplot(y=df_plot[column], x=df_plot['first_funding_at_year'])
```

```
[ ]: <Axes: xlabel='first_funding_at_year', ylabel='round_H'>
```



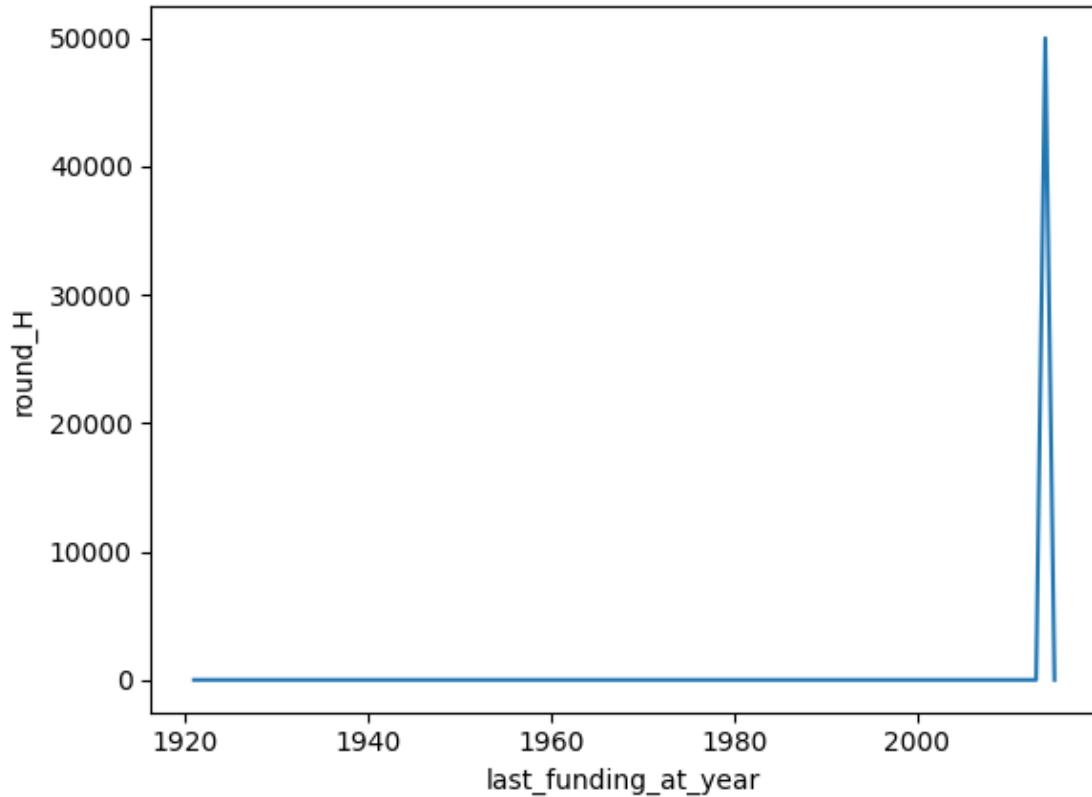
```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'sum'})  
      .reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='round_H'>
```



```
[ ]: df_plot = df_clean.groupby('last_funding_at_year').agg({column:'mean'}).  
      ↪reset_index().sort_values(column, ascending=False)  
df_plot = df_plot[df_plot['last_funding_at_year'] > 1000]  
sns.lineplot(y=df_plot[column], x=df_plot['last_funding_at_year'])
```

```
[ ]: <Axes: xlabel='last_funding_at_year', ylabel='round_H'>
```



## 1.26 Tabluar Analysis

```
[ ]: agg_dict = {'seed':'sum',
 'venture':'sum',
 'equity_crowdfunding':'sum',
 'undisclosed':'sum',
 'convertible_note':'sum',
 'debt_financing':'sum',
 'angel':'sum',
 'grant':'sum',
 'private_equity':'sum',
 'post_ipo_equity':'sum',
 'post_ipo_debt':'sum',
 'secondary_market':'sum',
 'product_crowdfunding':'sum',
 } 
```

```
[ ]: attribute = 'category_list'
column = 'venture'
```

```
[ ]: df_clean.groupby(attribute).agg(agg_dict).reset_index().
    ↪sort_values(column, ascending=False).head(10)
```

	category_list	seed	venture	equity_crowdfunding	\	
63	Biotechnology	435184351	59451553212	4929000		
693	Software	1546521908	47422006420	25637596		
464	Mobile	1468670815	28487793993	3625227		
215	E-Commerce	940496019	26805939118	13639308		
254	Enterprise Software	631805923	26486127159	2461553		
333	Health Care	340702404	24427876691	1375000		
105	Clean Technology	135474935	24180266430	13879518		
8	Advertising	632320528	18977376959	3928197		
166	Curated Web	879983910	15042243529	1145190		
20	Analytics	533068020	13037322956	2615200		
	undisclosed	convertible_note	debt_financing	angel	grant	\
63	411735799	287344889	10772010383	39431235	1194360753	
693	542757052	75644603	4092151492	479794852	70786380	
464	180598135	85339231	32242436839	507582129	349956460	
215	910726800	26018762	1361031373	390251036	9675575	
254	176625874	42730932	1662771709	190643654	31472551	
333	166444801	156388024	6919274297	48786460	402414079	
105	431710718	24019380	7669131322	28085680	1386677315	
8	156383181	7348207	790779667	236982015	3779732	
166	177522118	18964198	1231376812	270408703	22273996	
20	40656561	16268286	908414054	145131287	13196219	
	private_equity	post_ipo_equity	post_ipo_debt	secondary_market	\	
63	10220041660	5089391623	796883079	79300000		
693	8804023503	2071886793	205590000	471093789		
464	4811657880	6153869702	1231396395	20000000		
215	5817222351	486626162	235000000	4700000		
254	2285046167	269608086	2000000000	210000000		
333	5604667881	2273507835	362000000	2500000		
105	13033673330	1616136303	101900000	0		
8	2326172993	34926547	0	0		
166	2241536491	1462696463	0	126910000		
20	2487591929	14263769	0	13911263		
	product_crowdfunding					
63		6361749				
693		13728429				
464		9322732				
215		9747003				
254		1400000				
333		6034381				
105		3122580				

```
8          969882
166        1014981
20          0
```

```
[ ]: agg_dict_rnd = {'round_A':'sum',
'round_B':'sum',
'round_C':'sum',
'round_D':'sum',
'round_E':'sum',
'round_F':'sum',
'round_G':'sum',
'round_H':'sum'}
```

```
[ ]: attribute = 'category_list'
column = 'round_A'
```

```
[ ]: df_clean.groupby(attribute).agg(agg_dict_rnd).reset_index().
    ↪sort_values(column,ascending=False).head(10)
```

```
[ ]: category_list      round_A      round_B      round_C      round_D \
63           Biotechnology  9656487166  12076248199  8876420030  5120227612
693          Software       8032902872   9460918340  7140657357  4430169881
464          Mobile        6243842028   6469898148  4835186794  2676826584
215          E-Commerce    4701625673   4614868723  4773659748  2390078381
254 Enterprise Software  4464590231   5739120778  4601069406  3071643561
8            Advertising   3462689450   4273744038  3351548842  2330464004
166          Curated Web  2957617015   2967335635  2418025784  2182105237
333          Health Care  2932645358   4825176647  4439154315  2373223359
301          Games         2746634515   2844414858  2363037626  834197810
679          Social Media  2491368621   2800037101  2457875648  1672429659
```

```
      round_E      round_F      round_G      round_H
63  2163462493  1268872932  1280000000          0
693 1576180291  1829641870  6315000000          0
464 1379568255  361334761   269067711           0
215 2319059013  1204801159  1169985435  6546000000
254 1835124156  1663863463   300000000          0
8   1191787447  4300000000     818427           0
166 8305000000  6287500000  637000000          0
333 1528271391  257500004   212890114           0
301 175055336   47200019   190000000  490000000
679 634966511   5000000000  400000000          0
```

```
[ ]:
```

### **1.27 Recommendations:**

1. Among different sources of funds Venture Capital Funds have funded start ups in the past. Hence start up founders should focus on gaining access to these funds.
2. Historically it is seen that Round B has the most amount of funds accumulated so start up founders need to target the first and second round to raise maximum number of funds from investors.
3. Commonly most sector undergo funding of from 3-5 rounds
4. Start ups from Biotechnology, Mobile and Software sectors have posed the largest opportunities to raise funds. While Natural Gas Uses, Limousines and Oil and Gas sectors have produced large average funding figures historically.
5. Most startups which are operating currently have secured the highest amount of funds while acquired startups have the highest average fundings
6. USA is the prime country for prosperous startup ecosystem and investment options
7. California is one of the most successful states in the world to nurture startup ecosystem as it has startups that have received huge amount of fundings
8. SF Bay Area is the most popular city to nurture start up ecosystems and fetch large fundings
9. The 21st century has posed to be the era of start ups as the fundings in this age have increased exponentially
10. Over the years from 1900 there have been a lot of start ups which have attracted large fundings
11. January month which in turn is the 1st quarter poses to be the most successful months for start ups found during this month have attracted large amount of funds

[ ]: