In [1]:

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
sns.set(color_codes=True)
```

In [2]:

```
data = pd.read_csv("games.csv")
data.head()
```

Out[2]:

	id	type	name	yearpublished	minplayers	maxplayers	playingtime	minplaytime	maxplay
0	12333	boardgame	Twilight Struggle	2005.0	2.0	2.0	180.0	180.0	
1	120677	boardgame	Terra Mystica	2012.0	2.0	5.0	150.0	60.0	
2	102794	boardgame	Caverna: The Cave Farmers	2013.0	1.0	7.0	210.0	30.0	
3	25613	boardgame	Through the Ages: A Story of Civilization	2006.0	2.0	4.0	240.0	240.0	
4	3076	boardgame	Puerto Rico	2002.0	2.0	5.0	150.0	90.0	

In [3]:

```
data.shape
```

Out[3]:

```
(81312, 20)
```

In [4]:

```
data.info
```

Out[4]:

```
<bound method DataFrame.info of            id                type  \
0       12333           boardgame
1      120677           boardgame
2      102794           boardgame
3       25613           boardgame
4        3076           boardgame
...       ...                 ...
81307  184441  boardgameexpansion
81308  184442           boardgame
81309  184443           boardgame
81310  184449           boardgame
81311  184451           boardgame

                                                    name  yearpublished  \
0                                    Twilight Struggle         2005.0
1                                        Terra Mystica         2012.0
2                             Caverna: The Cave Farmers         2013.0
3              Through the Ages: A Story of Civilization         2006.0
4                                          Puerto Rico         2002.0
...                                                ...            ...
81307                          Micro Rome: Aegyptus         2015.0
81308  Trivial Pursuit: Marvel Cinematic Universe  Da...         2013.0
81309                                       BEARanoia         2015.0
81310                                         Freight         2015.0
81311                          Bingo Animal Kids         2010.0

       minplayers  maxplayers  playingtime  minplaytime  maxplaytime  minage  \
```

```
0             2.0         2.0        180.0        180.0        180.0    13.0
1             2.0         5.0        150.0         60.0        150.0    12.0
2             1.0         7.0        210.0         30.0        210.0    12.0
3             2.0         4.0        240.0        240.0        240.0    12.0
4             2.0         5.0        150.0         90.0        150.0    12.0
...           ...         ...          ...          ...          ...     ...
81307         1.0         1.0          0.0         30.0          0.0    10.0
81308         2.0         0.0          0.0          0.0          0.0    12.0
81309         2.0        15.0          1.0          1.0          1.0     0.0
81310         2.0         4.0         60.0         30.0         60.0     8.0
81311         1.0         6.0         10.0         10.0         10.0     2.0

       users_rated  average_rating  bayes_average_rating  total_owners  \
0            20113         8.33774               8.22186         26647
1            14383         8.28798               8.14232         16519
2             9262         8.28994               8.06886         12230
3            13294         8.20407               8.05804         14343
4            39883         8.14261               8.04524         44362
...            ...             ...                   ...           ...
81307            0         0.00000               0.00000             0
81308            0         0.00000               0.00000             0
81309            0         0.00000               0.00000             0
81310            0         0.00000               0.00000             0
81311            0         0.00000               0.00000             0

       total_traders  total_wanters  total_wishers  total_comments  \
0                372           1219           5865            5347
1                132           1586           6277            2526
2                 99           1476           5600            1700
3                362           1084           5075            3378
4                795            861           5414            9173
...              ...            ...            ...             ...
81307              0              0              0               0
81308              0              0              0               0
81309              0              0              0               0
81310              0              0              0               0
81311              0              0              0               0

       total_weights  average_weight
0               2562          3.4785
1               1423          3.8939
2                777          3.7761
3               1642          4.1590
4               5213          3.2943
...              ...             ...
81307              0          0.0000
81308              0          0.0000
81309              0          0.0000
81310              0          0.0000
81311              0          0.0000

[81312 rows x 20 columns]>
```

In [5]:
```
data.columns
```

Out[5]:
```
Index(['id', 'type', 'name', 'yearpublished', 'minplayers', 'maxplayers',
       'playingtime', 'minplaytime', 'maxplaytime', 'minage', 'users_rated',
       'average_rating', 'bayes_average_rating', 'total_owners',
       'total_traders', 'total_wanters', 'total_wishers', 'total_comments',
       'total_weights', 'average_weight'],
      dtype='object')
```

In [6]:
```
data.isna().any()
```

Out[6]:
```
id                     False
type                   False
name                    True
yearpublished           True
```

```
minplayers              True
maxplayers              True
playingtime             True
minplaytime             True
maxplaytime             True
minage                  True
users_rated            False
average_rating         False
bayes_average_rating   False
total_owners           False
total_traders          False
total_wanters          False
total_wishers          False
total_comments         False
total_weights          False
average_weight         False
dtype: bool
```

In [7]:
```
data.describe()
```

Out[7]:

	id	yearpublished	minplayers	maxplayers	playingtime	minplaytime	maxplaytime	
count	81312.000000	81309.000000	81309.000000	81309.000000	81309.000000	81309.000000	81309.000000	8
mean	72278.150138	1806.630668	1.992018	5.637703	51.634788	49.276833	51.634788	
std	58818.237742	588.517834	0.931034	56.076890	345.699969	334.483934	345.699969	
min	1.000000	-3500.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
25%	21339.750000	1984.000000	2.000000	2.000000	8.000000	10.000000	8.000000	
50%	43258.000000	2003.000000	2.000000	4.000000	30.000000	30.000000	30.000000	
75%	128836.500000	2010.000000	2.000000	6.000000	60.000000	60.000000	60.000000	
max	184451.000000	2018.000000	99.000000	11299.000000	60120.000000	60120.000000	60120.000000	

In [8]:
```
data['id'].count()
```

Out[8]:
```
81312
```

In [10]:
```
data['type'].unique()
```

Out[10]:
```
array(['boardgame', 'boardgameexpansion'], dtype=object)
```

In [11]:
```
data.iloc[data['total_wanters'].idxmax()]
```

Out[11]:
```
id                          120677
type                     boardgame
name                Terra Mystica
yearpublished              2012.0
minplayers                    2.0
maxplayers                    5.0
playingtime                 150.0
minplaytime                  60.0
maxplaytime                 150.0
minage                       12.0
users_rated                 14383
average_rating            8.28798
bayes_average_rating      8.14232
total_owners                16519
total_traders                 132
total_wanters                1586
total_wishers                6277
total_comments               2526
```

```
total_weights                  1423
average_weight               3.8939
Name: 1, dtype: object
```

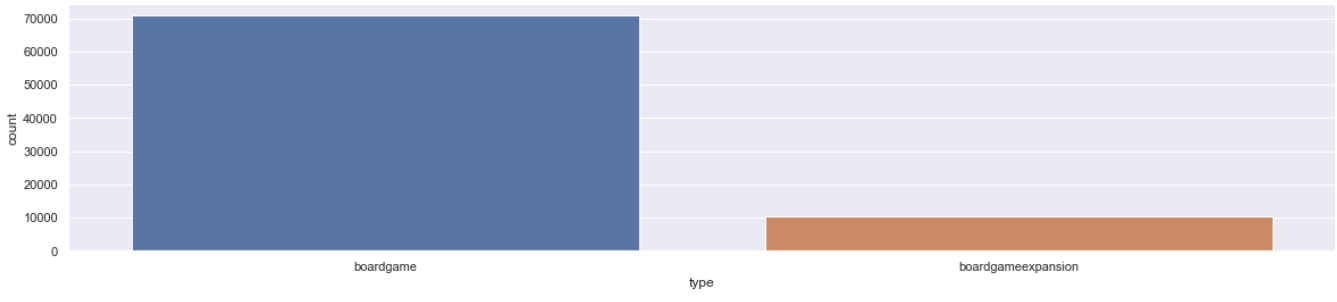
In [12]:
```
data.iloc[data['total_wishers'].idxmax()]
```

Out[12]:
```
id                           31260
type                     boardgame
name                       Agricola
yearpublished                2007.0
minplayers                      1.0
maxplayers                      5.0
playingtime                   150.0
minplaytime                    30.0
maxplaytime                   150.0
minage                         12.0
users_rated                   39714
average_rating              8.11957
bayes_average_rating        8.03847
total_owners                  47522
total_traders                   837
total_wanters                   958
total_wishers                  6402
total_comments                 9310
total_weights                  5065
average_weight                3.616
Name: 5, dtype: object
```

In [13]:
```
data.iloc[data['total_wishers'].idxmin()]
```

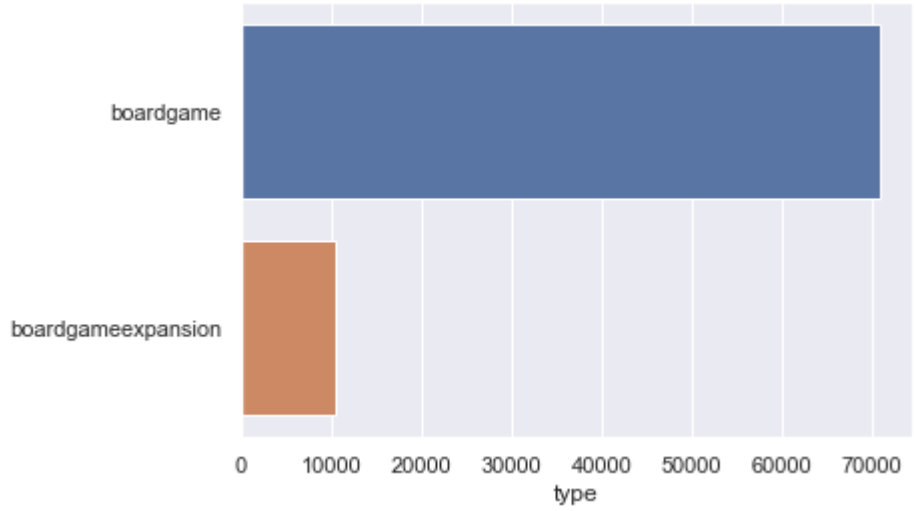
Out[13]:
```
id                             147168
type                        boardgame
name                Guerra De Mitos II
yearpublished                   2013.0
minplayers                         2.0
maxplayers                         6.0
playingtime                       20.0
minplaytime                       20.0
maxplaytime                       20.0
minage                            10.0
users_rated                         44
average_rating                 8.38636
bayes_average_rating           5.59127
total_owners                        56
total_traders                        2
total_wanters                        0
total_wishers                        0
total_comments                       4
total_weights                        3
average_weight                1.6667
Name: 7171, dtype: object
```

In [20]:
```
fig_dims = (20,4)
fig, ax = plt.subplots(figsize=fig_dims)
sns.countplot(x='type', ax=ax,data=data)
plt.show()
```



In [22]:
```
data1 = data.type.value_counts()
sns.barplot(y=data1.index, x = data1)
```

Out[22]:
```
<AxesSubplot:xlabel='type'>
```



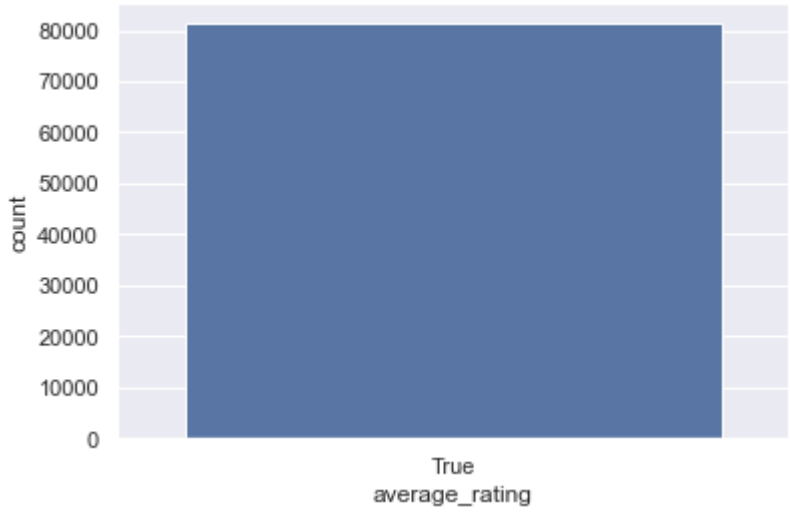
In [25]:
```
probability = data['average_rating']==data['average_rating']
probability.groupby(probability).size()
```

Out[25]:
```
average_rating
True    81312
Name: average_rating, dtype: int64
```

In [26]:
```
sns.countplot(probability)
```

```
C:\Users\swara\AppData\Local\Programs\Python\Python39\lib\site-packages\seaborn\_deco
rators.py:36: FutureWarning: Pass the following variable as a keyword arg: x. From ve
rsion 0.12, the only valid positional argument will be `data`, and passing other argu
ments without an explicit keyword will result in an error or misinterpretation.
  warnings.warn(
```

Out[26]:
```
<AxesSubplot:xlabel='average_rating', ylabel='count'>
```



In [29]:
```
data['type'].value_counts()
```

Out[29]:
```
boardgame             70820
boardgameexpansion    10492
Name: type, dtype: int64
```

In [31]:
```
data['yearpublished'].value_counts()
```

Out[31]:
```
0.0       7678
2014.0    4648
```

```
2013.0    4025
2015.0    3873
2012.0    3836
          ...
1663.0       1
1762.0       1
500.0        1
1784.0       1
1350.0       1
Name: yearpublished, Length: 323, dtype: int64
```

In [32]:
```
data['maxplaytime'].value_counts()
```

Out[32]:
```
0.0       18871
30.0      13097
60.0       9411
20.0       6967
45.0       5904
          ...
810.0         1
111.0         1
8400.0        1
2005.0        1
999.0         1
Name: maxplaytime, Length: 134, dtype: int64
```

In [ ]:
```

```