Analysis of LEGO brick prices over the years with PySpark

BigData Projekt

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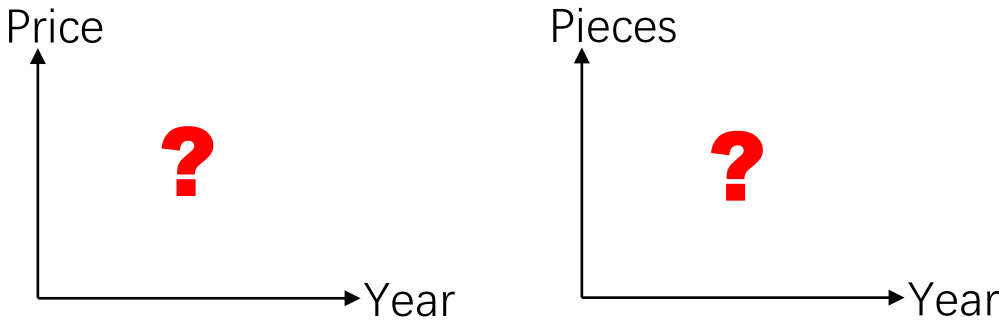
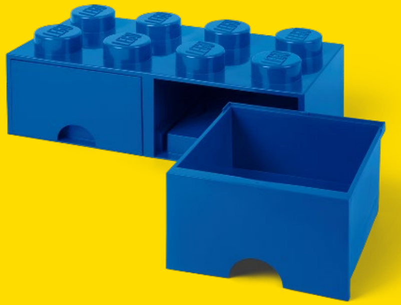
Aim

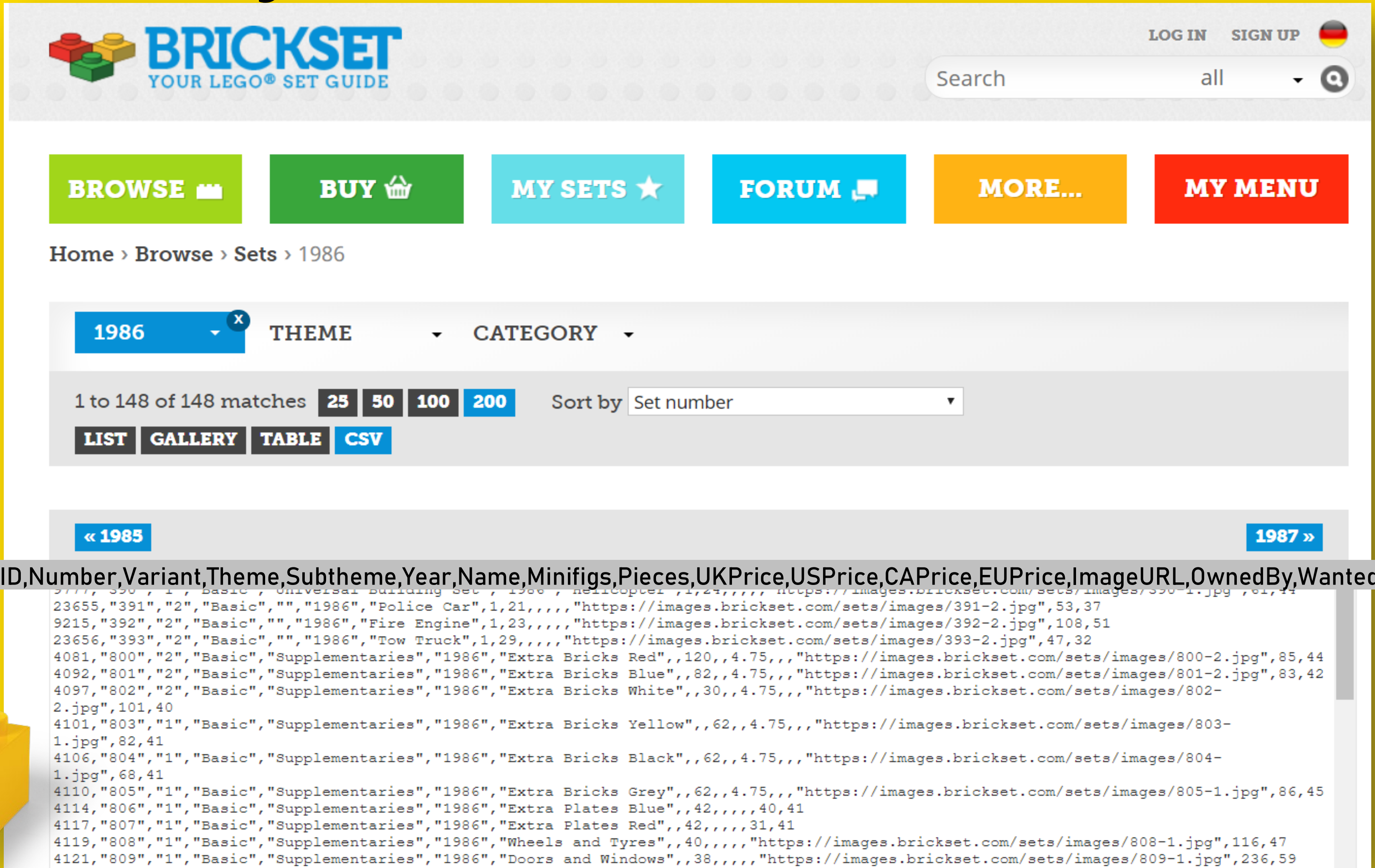
to evaluate the price history of LEGO sets

and the Mass of pasts LEGO sets





How is my dataset



SetID,Number,Variant,Theme,Subtheme,Year,Name,Minifigs,Pieces,UKPrice,USPrice,CAPrice,EUPrice,ImageURL,OwnedBy,WantedBy

```
23655,"391","2","Basic","","1986","Police Car",1,21,,,,,"https://images.brickset.com/sets/images/391-2.jpg",53,37
9215,"392","2","Basic","","1986","Fire Engine",1,23,,,,,"https://images.brickset.com/sets/images/392-2.jpg",108,51
23656,"393","2","Basic","","1986","Tow Truck",1,29,,,,,"https://images.brickset.com/sets/images/393-2.jpg",47,32
4081,"800","2","Basic","Supplementaries","1986","Extra Bricks Red",,120,,4.75,,,"https://images.brickset.com/sets/images/800-2.jpg",85,44
4092,"801","2","Basic","Supplementaries","1986","Extra Bricks Blue",,82,,4.75,,,"https://images.brickset.com/sets/images/801-2.jpg",83,42
4097,"802","2","Basic","Supplementaries","1986","Extra Bricks White",,30,,4.75,,,"https://images.brickset.com/sets/images/802-
2.jpg",101,40
4101,"803","1","Basic","Supplementaries","1986","Extra Bricks Yellow",,62,,4.75,,,"https://images.brickset.com/sets/images/803-
1.jpg",82,41
4106,"804","1","Basic","Supplementaries","1986","Extra Bricks Black",,62,,4.75,,,"https://images.brickset.com/sets/images/804-
1.jpg",68,41
4110,"805","1","Basic","Supplementaries","1986","Extra Bricks Grey",,62,,4.75,,,"https://images.brickset.com/sets/images/805-1.jpg",86,45
4114,"806","1","Basic","Supplementaries","1986","Extra Plates Blue",,42,,,,,40,41
4117,"807","1","Basic","Supplementaries","1986","Extra Plates Red",,42,,,,,31,41
4119,"808","1","Basic","Supplementaries","1986","Wheels and Tyres",,40,,,,,"https://images.brickset.com/sets/images/808-1.jpg",116,47
4121,"809","1","Basic","Supplementaries","1986","Doors and Windows",,38,,,,,"https://images.brickset.com/sets/images/809-1.jpg",236,59
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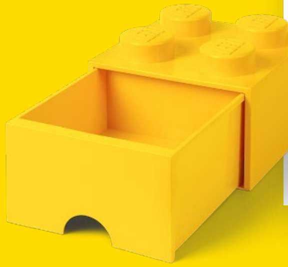
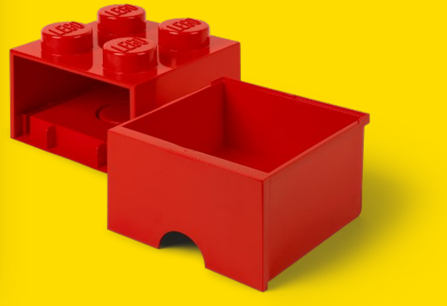
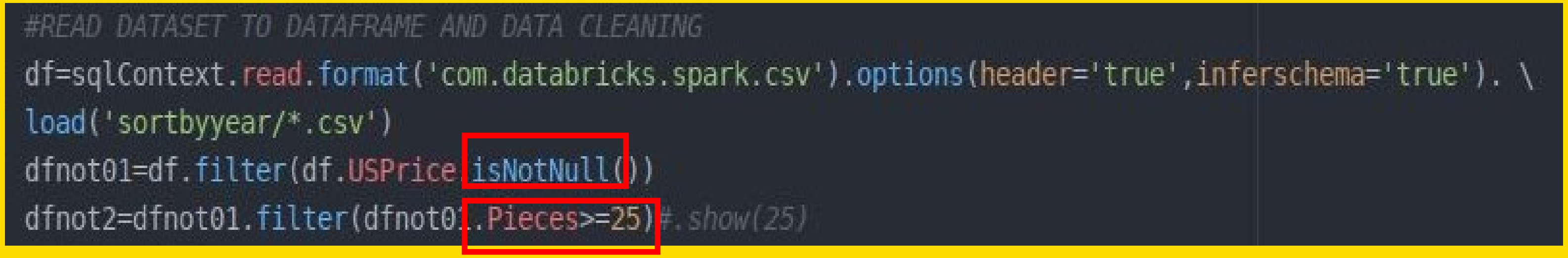




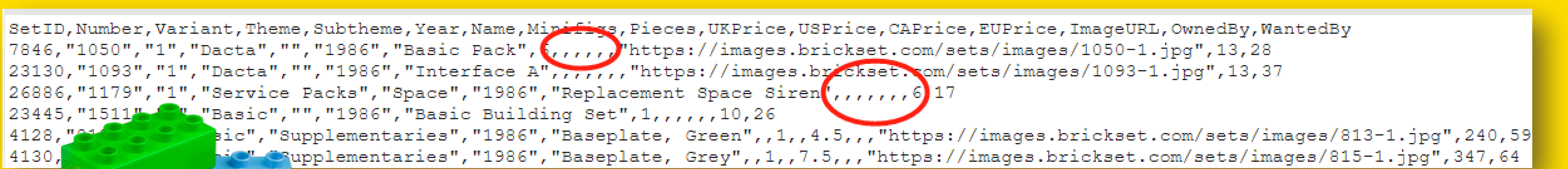
LEGO

1st Step

DataCleaning

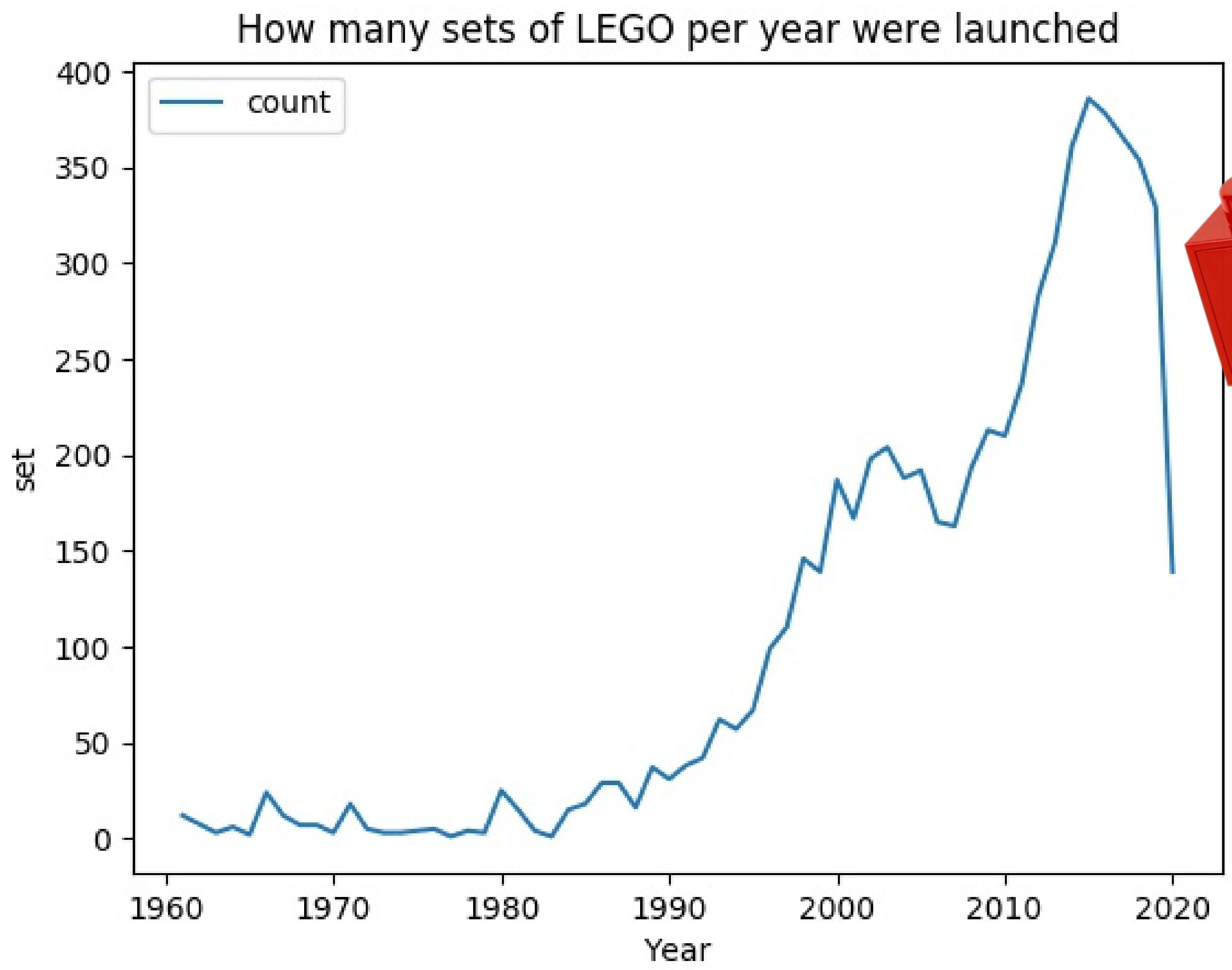


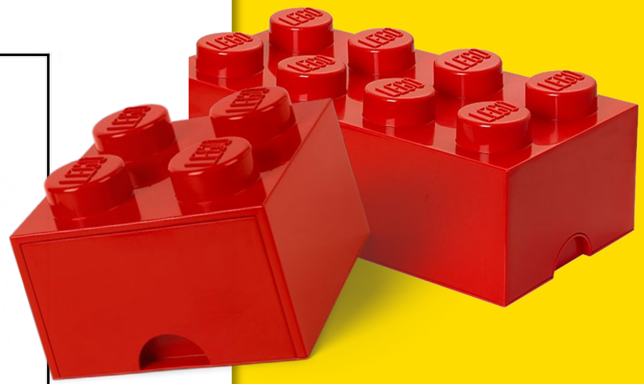
```
#READ DATASET TO DATAFRAME AND DATA CLEANING
df=sqlContext.read.format('com.databricks.spark.csv').options(header='true',inferschema='true'). \
load('sortbyyear/*.csv')
dfnot01=df.filter(df.USPrice.isNotNull())
dfnot2=dfnot01.filter(dfnot01.Pieces>=25)#.show(25)
```



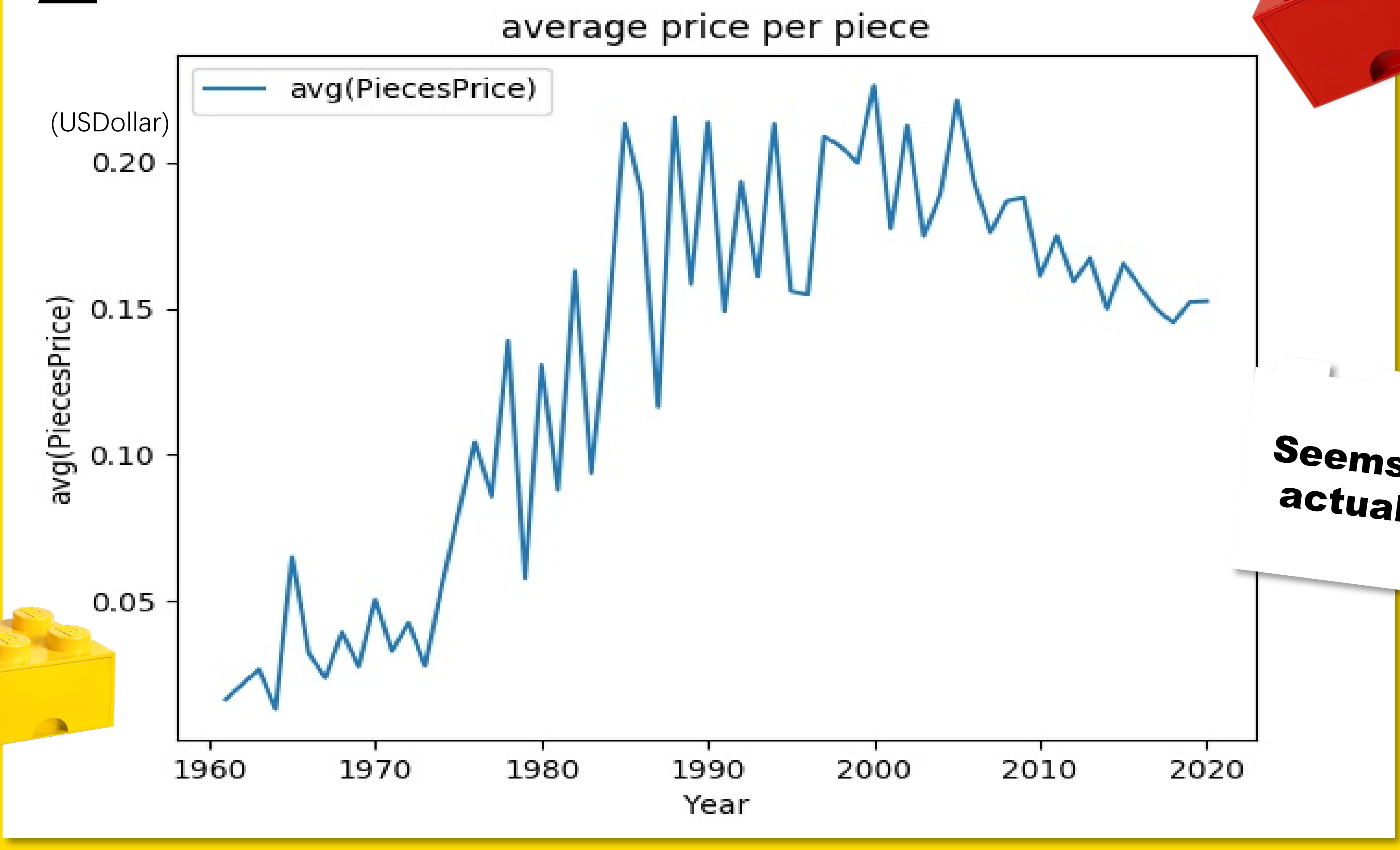
```
SetID,Number,Variant,Theme,Subtheme,Year,Name,Minifigs,Pieces,UKPrice,USPrice,CAPrice,EUPrice,ImageURL,OwnedBy,WantedBy
7846,"1050","1","Dacta","","1986","Basic Pack",,,,,,,"https://images.brickset.com/sets/images/1050-1.jpg",13,28
23130,"1093","1","Dacta","","1986","Interface A",,,,,,,"https://images.brickset.com/sets/images/1093-1.jpg",13,37
26886,"1179","1","Service Packs","Space","1986","Replacement Space Siren",,,,,,,,6,17
23445,"1511[illegible]"Basic","","1986","Basic Building Set",1,,,,,,10,26
4128,"[illegible]sic","Supplementaries","1986","Baseplate, Green",,1,,4.5,,,"https://images.brickset.com/sets/images/813-1.jpg",240,59
4130,[illegible]"Supplementaries","1986","Baseplate, Grey",,1,,7.5,,,"https://images.brickset.com/sets/images/815-1.jpg",347,64
```

Plot 1


How many sets of LEGO per year were launched
count
400
350
300
250
200
150
100
50
0
set
1960
1970
1980
1990
2000
2010
2020
Year

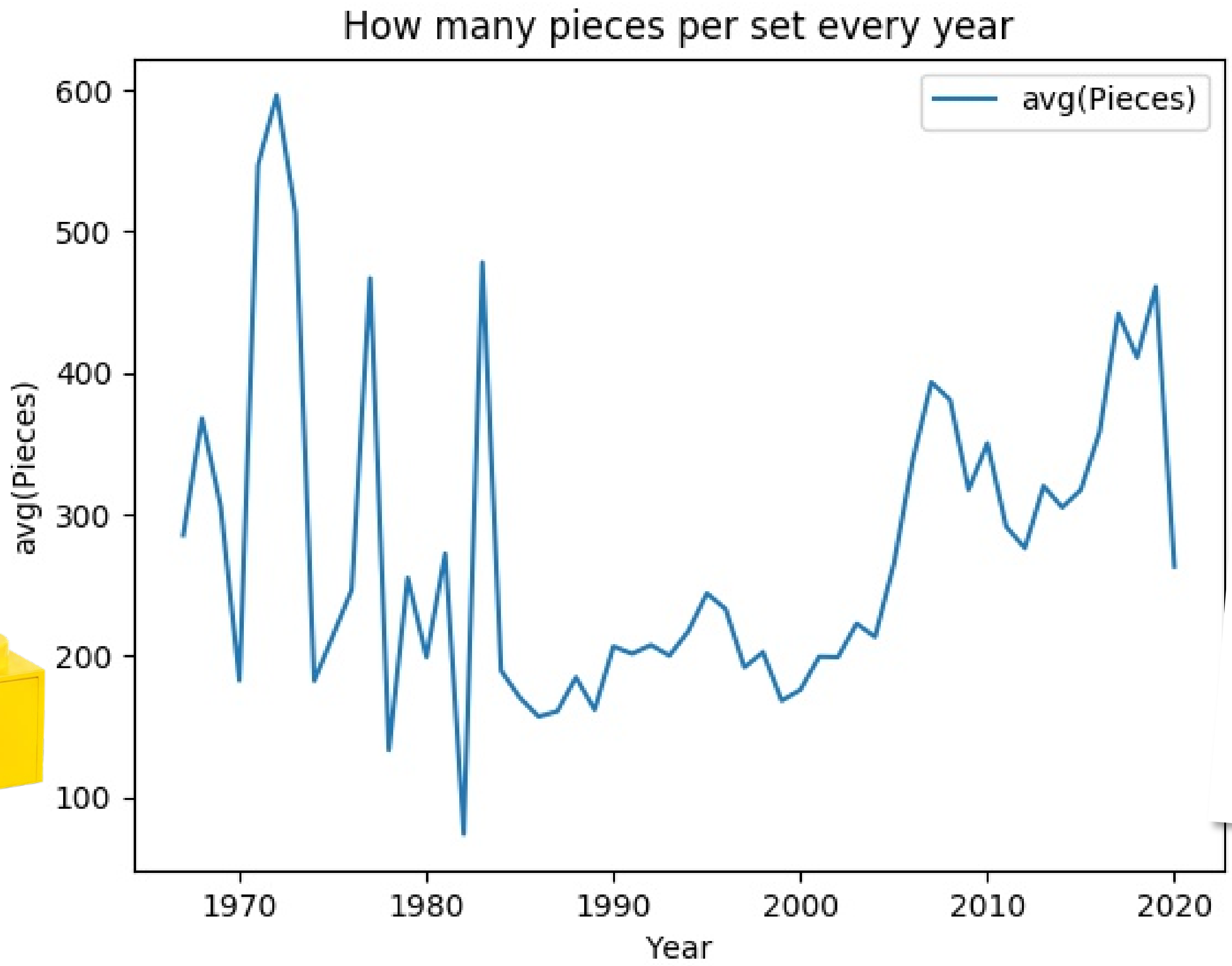


Plot 2



Seems to be increased , actually not

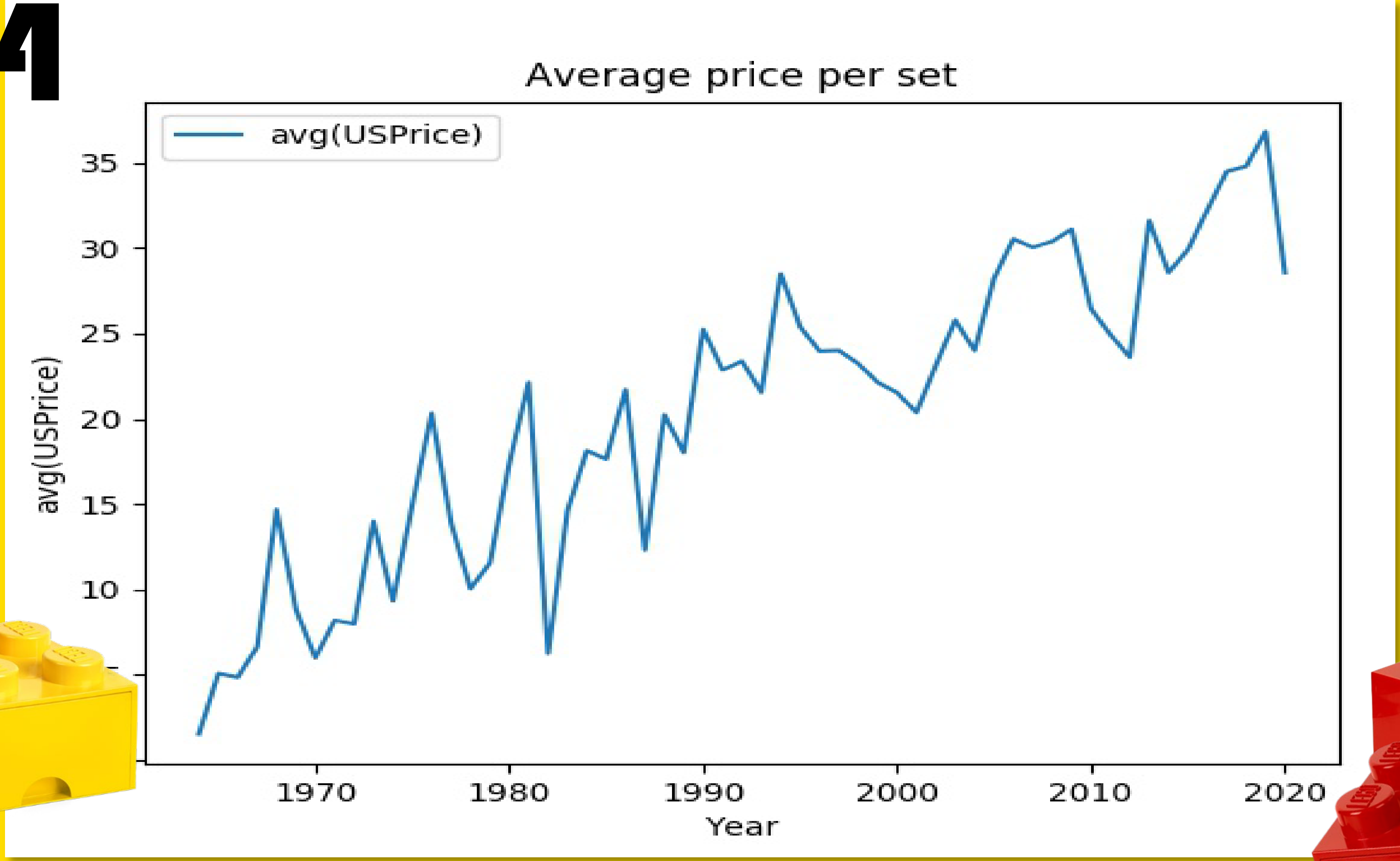
Plot 3



2007:Star Wars-Ultimate Collector's Millennium Falcon 5197

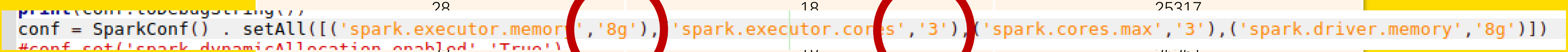
2008:Taj Mahal 5922

Plot 4

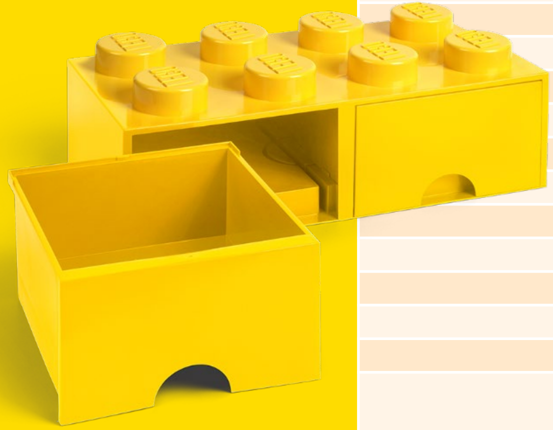

Average price per set
avg(USPrice)
35
30
25
20
15
10
avg(USPrice)
1970
1980
1990
2000
2010
2020
Year

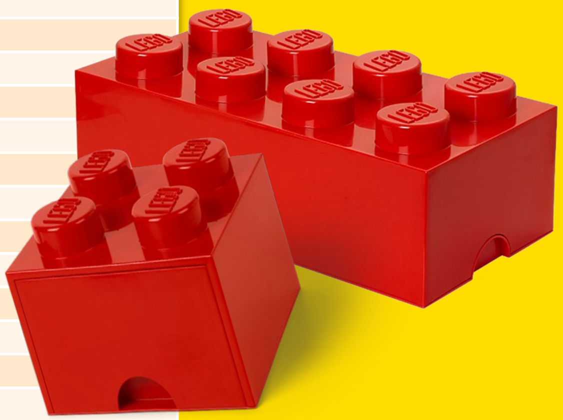
5.Benchmark Results

memory	executor cores	time
8	3	32096
80	9	26789
64	9	26416
30	9	27499
28	9	25703
40	9	27741
28	10	28492
16	9	27284
20	16	26847
45	16	26011
80	16	28068
64	18	27333
30	18	24802
28	18	25317
[illegible]	[illegible]	[illegible]
22	18	25361
8	20	26799
100	30	25031
3	30	25758
50	30	26098
1	30	26708
8	30	27467
5	30	29180
102	32	27028
100	32	27525
30	36	24346
24	36	24734
10	36	24215
20	36	24734
1	36	25196
4	36	25221
6	36	24596
… …	… …	… …

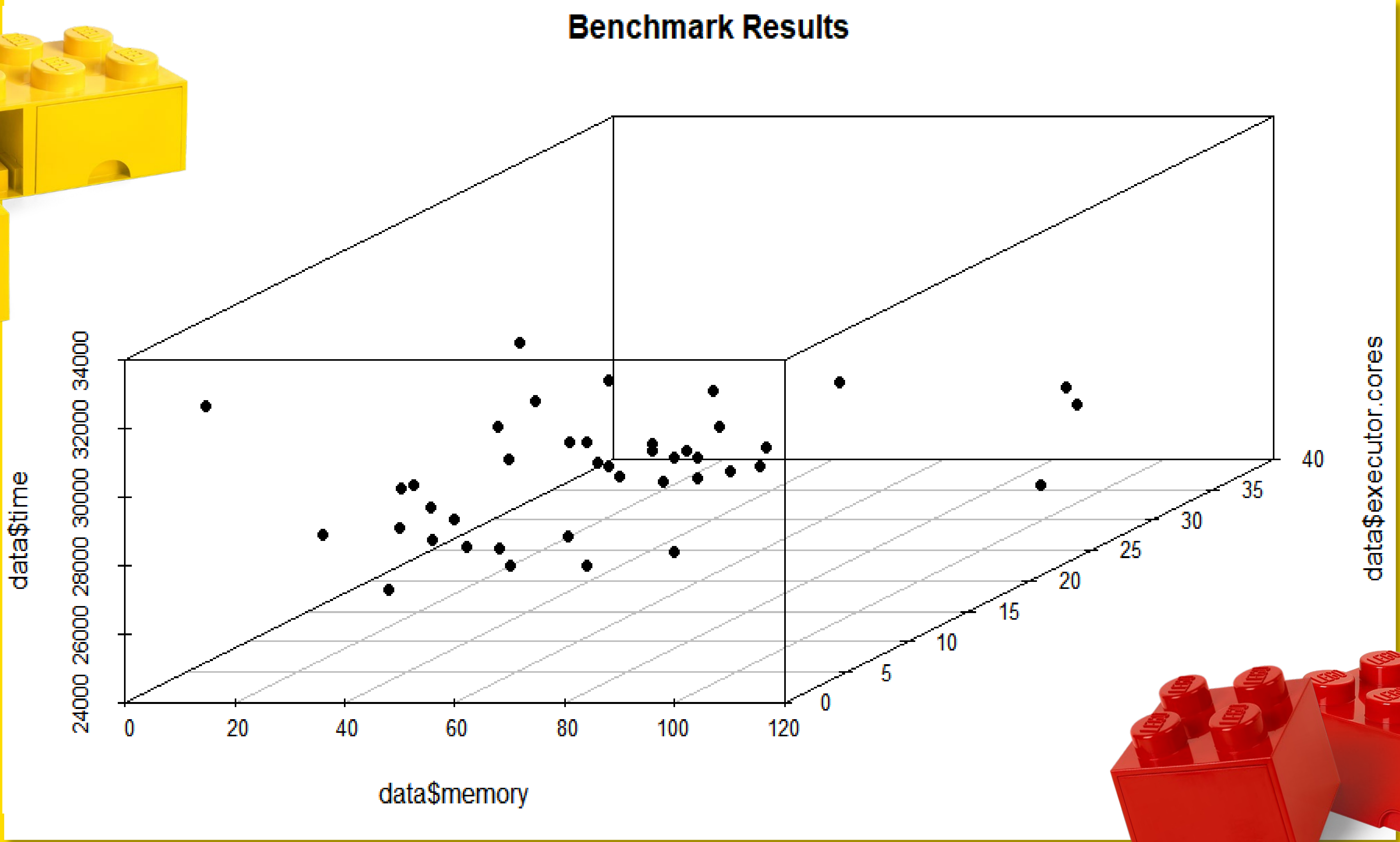


```
print(conf.toDebugString())
conf = SparkConf() . setAll([('spark.executor.memory','8g'),('spark.executor.cores','3'),('spark.cores.max','3'),('spark.driver.memory','8g')])
#conf.set('spark.dynamicAllocation.enabled','True')
```



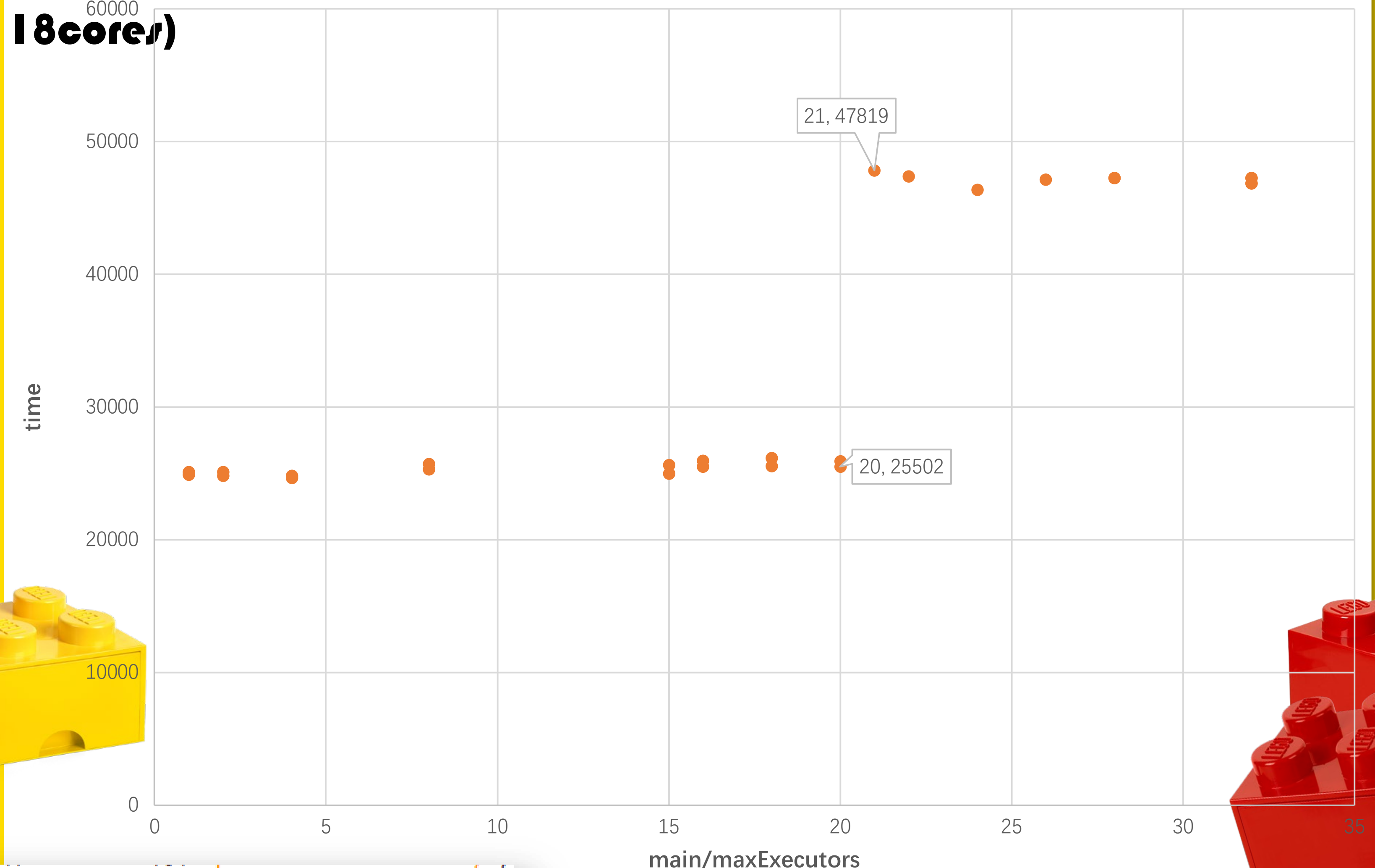


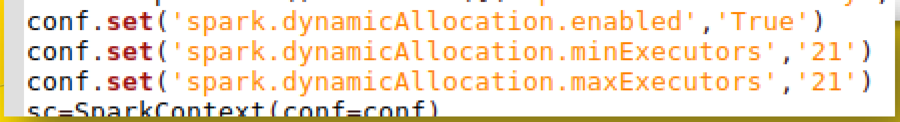
Benchmark Results



6.minExecutors & maxExecutors configuration

(with 64GB RAM, 18cores)





```
conf.set('spark.dynamicAllocation.enabled','True')
conf.set('spark.dynamicAllocation.minExecutors','21')
conf.set('spark.dynamicAllocation.maxExecutors','21')
sc=SparkContext(conf=conf)
```

Thanks for your attention.