In [1]:
```python
import pandas as pd
```

In [2]:
```python
df=pd.read_csv("vgsales.csv")
df.head()
```

Out[2]:

	Rank	Name	Platform	Year	Genre	Publisher	NA_Sales	EU_Sales	JP_Sa
0	1	Wii Sports	Wii	2006.0	Sports	Nintendo	41.49	29.02	3.77
1	2	Super Mario Bros.	NES	1985.0	Platform	Nintendo	29.08	3.58	6.81
2	3	Mario Kart Wii	Wii	2008.0	Racing	Nintendo	15.85	12.88	3.79
3	4	Wii Sports Resort	Wii	2009.0	Sports	Nintendo	15.75	11.01	3.28
4	5	Pokemon Red/Pokemon Blue	GB	1996.0	Role-Playing	Nintendo	11.27	8.89	10.22

In [3]:
```python
#1 Solution

res1=df[df['Genre']=="Racing"]['Publisher']
res1
```

```
Out[3]:  2                       Nintendo
        11                       Nintendo
        28       Sony Computer Entertainment
        42                       Nintendo
        47       Sony Computer Entertainment
        52       Sony Computer Entertainment
        54       Sony Computer Entertainment
        63                       Nintendo
        69       Sony Computer Entertainment
        76                       Nintendo
       104                 Electronic Arts
       108                       Nintendo
       110                       Nintendo
       113                 Electronic Arts
       160           Microsoft Game Studios
       163                       Nintendo
       213                       Nintendo
       220       Sony Computer Entertainment
       224                   Vivendi Games
       228           Microsoft Game Studios
       252                 Electronic Arts
       272       Sony Computer Entertainment
       277                       Nintendo
       291           Microsoft Game Studios
       309       Sony Computer Entertainment
       340                Take-Two Interactive
       344       Sony Computer Entertainment
       354                 Electronic Arts
       391                       Nintendo
       413       Sony Computer Entertainment
                            ...
     16209            Zoo Digital Publishing
     16219                        XS Games
     16244               Namco Bandai Games
     16245                Empire Interactive
     16270                        Rebellion
     16276                        505 Games
     16304                          Ubisoft
     16306                             Sega
     16307                          Unknown
     16309                              SCi
     16323                  Milestone S.r.l.
     16325           Microsoft Game Studios
     16340                           Encore
     16352                              THQ
     16354                        Activision
     16362                    Evolved Games
     16375                      Codemasters
     16379                    Vivendi Games
     16408                             Sega
     16428                Big Ben Interactive
     16442                      Codemasters
     16471                  Milestone S.r.l.
     16489                      Codemasters
     16490                  Black Bean Games
     16522                           Jaleco
     16530                   Milestone S.r.l
```

```
16543                        NaN
16573               Popcorn Arcade
16574                Takara Tomy
16595                 Activision
Name: Publisher, Length: 1249, dtype: object
```

In [4]:
```python
res2=res1.value_counts()
res2
```

```
Out[4]:  Electronic Arts                      159
         THQ                                  101
         Codemasters                           89
         Activision                            74
         Sony Computer Entertainment           65
         Ubisoft                               52
         Sega                                  48
         Acclaim Entertainment                 44
         Nintendo                              37
         Atari                                 36
         Namco Bandai Games                    27
         Zoo Digital Publishing                26
         Midway Games                          25
         Microsoft Game Studios                22
         Empire Interactive                    21
         Take-Two Interactive                  20
         Black Bean Games                      19
         Milestone S.r.l.                      16
         Infogrames                            15
         Disney Interactive Studios            14
         Eidos Interactive                     14
         Vivendi Games                         14
         Capcom                                13
         Unknown                               13
         Konami Digital Entertainment          13
         Psygnosis                              8
         Deep Silver                            7
         BAM! Entertainment                     7
         Bethesda Softworks                     7
         Nordic Games                           7
                                              ...
         MTO                                    1
         Accolade                               1
         Xicat Interactive                      1
         Virgin Interactive                     1
         SquareSoft                             1
         Human Entertainment                    1
         Imagineer                              1
         Yuke's                                 1
         Tomy Corporation                       1
         Vir2L Studios                          1
         Conspiracy Entertainment               1
         1C Company                             1
         bitComposer Games                      1
         Phenomedia                             1
         Mattel Interactive                     1
         Syscom                                 1
         Data Design Interactive                1
         O-Games                                1
         Sunrise Interactive                    1
         PQube                                  1
         ASC Games                              1
         RTL                                    1
         Mastertronic                           1
         BMG Interactive Entertainment          1
         The Learning Company                   1
         Pioneer LDC                            1
```

```
          Banpresto                        1
          Square                           1
          Playmates                        1
          TYO                              1
          Name: Publisher, Length: 128, dtype: int64
```

In [5]: `res2.nlargest(1)`

Out[5]:
```
          Electronic Arts     159
          Name: Publisher, dtype: int64
```

In [6]:
```
#2 Solution

res3=df[['Platform', 'NA_Sales']]
res3.head()
```

Out[6]:

	Platform	NA_Sales
0	Wii	41.49
1	NES	29.08
2	Wii	15.85
3	Wii	15.75
4	GB	11.27

In [7]:
```python
res4=res3.cumsum()
res4
```

Out[7]:

	Platform	NA_Sales
0	Wii	41.49
1	WiiNES	70.57
2	WiiNESWii	86.42
3	WiiNESWiiWii	102.17
4	WiiNESWiiWiiGB	113.44
5	WiiNESWiiWiiGBGB	136.64
6	WiiNESWiiWiiGBGBDS	148.02
7	WiiNESWiiWiiGBGBDSWii	162.05
8	WiiNESWiiWiiGBGBDSWiiWii	176.64
9	WiiNESWiiWiiGBGBDSWiiWiiNES	203.57
10	WiiNESWiiWiiGBGBDSWiiWiiNESDS	212.64
11	WiiNESWiiWiiGBGBDSWiiWiiNESDSDS	222.45
12	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGB	231.45
13	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWii	240.39
14	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWii	249.48
15	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360	264.45
16	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3	271.46
17	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3PS2	280.89
18	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	293.67
19	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	298.42
20	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	304.84
21	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	315.67
22	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	325.21
23	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	334.84
24	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	343.25
25	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	349.31
26	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	354.88
27	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	358.32
28	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	365.17
29	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	374.2
...	...	...
16568	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.81

	Platform	NA_Sales
16569	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.82
16570	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.82
16571	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.82
16572	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.82
16573	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.83
16574	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.83
16575	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.83
16576	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.83
16577	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.83
16578	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.84
16579	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.85
16580	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.85
16581	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.85
16582	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.86
16583	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.87
16584	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.88
16585	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.89
16586	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.89
16587	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.89
16588	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.9
16589	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.9
16590	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.9
16591	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.91
16592	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.92
16593	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.93
16594	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.94
16595	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.94
16596	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.94
16597	WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...	4392.95

16598 rows × 2 columns

In [8]: ```
res4.max()
```

Out[8]: ```
Platform     WiiNESWiiWiiGBGBDSWiiWiiNESDSDSGBWiiWiiX360PS3...
NA_Sales                                              4392.95
dtype: object
```

In [9]: ```
#3 Solution

res5=df.loc[df['Year']==2009].max()
res5
```

Out[9]: ```
Rank                        16590
Name              th!nk Logic Trainer
Platform                     X360
Year                         2009
Genre                     Strategy
Publisher         bitComposer Games
NA_Sales                     15.75
EU_Sales                     11.01
JP_Sales                       4.7
Other_Sales                   2.96
Global_Sales                    33
dtype: object
```

In [10]: ```
res5.Genre
```

Out[10]: ```
'Strategy'
```

In [11]:
```
#4 Solution

df.groupby(['Year','Genre']).sum()
```

Out[11]:

Year	Genre	Rank	NA_Sales	EU_Sales	JP_Sales	Other_Sales	Global_Sales
1980.0	**Action**	5368	0.32	0.02	0.00	0.00	0.34
	Fighting	2671	0.72	0.04	0.00	0.01	0.77
	Misc	16956	2.53	0.15	0.00	0.02	2.71
	Shooter	804	6.56	0.43	0.00	0.08	7.07
	Sports	4027	0.46	0.03	0.00	0.01	0.49
1981.0	**Action**	111447	13.86	0.81	0.00	0.12	14.84
	Platform	3693	6.47	0.37	0.00	0.08	6.93
	Puzzle	4513	2.09	0.13	0.00	0.03	2.24
	Racing	4141	0.45	0.03	0.00	0.00	0.48
	Shooter	31031	9.37	0.56	0.00	0.09	10.04
	Simulation	4348	0.42	0.02	0.00	0.00	0.45
	Sports	31315	0.74	0.04	0.00	0.00	0.79
1982.0	**Action**	102009	6.07	0.38	0.00	0.05	6.52
	Misc	2408	0.81	0.05	0.00	0.01	0.87
	Platform	11520	4.69	0.28	0.00	0.06	5.03
	Puzzle	4656	9.35	0.58	0.00	0.11	10.03
	Racing	6603	1.47	0.09	0.00	0.01	1.57
	Shooter	14330	3.55	0.21	0.00	0.05	3.79
	Sports	7660	0.98	0.06	0.00	0.02	1.05
1983.0	**Action**	36311	2.67	0.17	0.00	0.02	2.86
	Adventure	4782	0.38	0.02	0.00	0.00	0.40
	Misc	765	0.01	0.00	2.13	0.00	2.14
	Platform	7727	2.80	0.43	3.62	0.08	6.93
	Puzzle	2654	0.72	0.05	0.00	0.01	0.78
	Shooter	4098	0.45	0.03	0.00	0.01	0.48
	Sports	422	0.73	0.10	2.35	0.02	3.20
1984.0	**Action**	940	0.80	0.19	0.83	0.03	1.85
	Misc	1326	0.00	0.00	1.45	0.00	1.45
	Platform	2957	0.00	0.00	0.69	0.00	0.69
	Puzzle	6014	0.69	0.18	2.23	0.04	3.14
...	**...**	...	...	...	...	...	...

Year	Genre	Rank	NA_Sales	EU_Sales	JP_Sales	Other_Sales	Global_Sales
2014.0	Shooter	196375	30.72	25.81	1.08	8.38	66.00
	Simulation	99158	1.22	3.44	0.37	0.51	5.55
	Sports	320026	19.82	18.70	1.60	6.52	46.66
	Strategy	89903	0.16	0.22	0.55	0.04	0.99
2015.0	Action	2706253	22.83	24.65	15.85	7.33	70.70
	Adventure	684479	2.76	3.38	1.04	0.85	8.03
	Fighting	195430	3.60	2.38	0.79	1.01	7.78
	Misc	348067	4.81	3.71	2.10	1.04	11.69
	Platform	134542	2.50	1.81	1.29	0.45	6.05
	Puzzle	72767	0.05	0.11	0.52	0.01	0.70
	Racing	170947	1.97	4.74	0.28	0.93	7.92
	Role-Playing	706714	13.35	12.52	6.71	3.85	36.44
	Shooter	125348	30.79	24.23	2.69	8.41	66.15
	Simulation	134689	1.13	2.51	1.58	0.39	5.62
	Sports	529044	18.46	16.69	0.72	5.62	41.54
	Strategy	207567	0.57	0.98	0.15	0.12	1.82
2016.0	Action	1380834	5.87	6.36	5.79	1.83	19.91
	Adventure	476750	0.34	0.39	0.97	0.11	1.81
	Fighting	137050	1.60	1.15	0.64	0.46	3.86
	Misc	237814	0.22	0.09	0.81	0.03	1.17
	Platform	108603	0.79	0.87	0.11	0.31	2.07
	Racing	256335	0.33	1.14	0.01	0.19	1.64
	Role-Playing	425798	1.39	1.29	3.63	0.44	6.76
	Shooter	279947	7.44	7.70	0.61	2.42	18.22
	Simulation	129167	0.00	0.09	0.30	0.00	0.39
	Sports	360626	4.57	7.36	0.78	1.92	14.60
	Strategy	138736	0.11	0.32	0.05	0.04	0.50
2017.0	Action	16441	0.00	0.00	0.01	0.00	0.01
	Role-Playing	30637	0.00	0.00	0.04	0.00	0.04

Year	Genre	Rank	NA_Sales	EU_Sales	JP_Sales	Other_Sales	Global_Sales
2020.0	**Simulation**	5959	0.27	0.00	0.00	0.02	0.29

389 rows × 6 columns

In [12]:
```python
df1=df.groupby(['Year', 'Genre']).size()
df1
```

```
Out[12]:  Year     Genre
          1980.0   Action          1
                   Fighting        1
                   Misc            4
                   Shooter         2
                   Sports          1
          1981.0   Action         25
                   Platform        3
                   Puzzle          2
                   Racing          1
                   Shooter        10
                   Simulation      1
                   Sports          4
          1982.0   Action         18
                   Misc            1
                   Platform        5
                   Puzzle          3
                   Racing          2
                   Shooter         5
                   Sports          2
          1983.0   Action          7
                   Adventure       1
                   Misc            1
                   Platform        5
                   Puzzle          1
                   Shooter         1
                   Sports          1
          1984.0   Action          1
                   Misc            1
                   Platform        1
                   Puzzle          3
                                 ...
          2014.0   Shooter        47
                   Simulation     11
                   Sports         55
                   Strategy        8
          2015.0   Action        255
                   Adventure      54
                   Fighting       21
                   Misc           39
                   Platform       14
                   Puzzle          6
                   Racing         19
                   Role-Playing   78
                   Shooter        34
                   Simulation     15
                   Sports         62
                   Strategy       17
          2016.0   Action        119
                   Adventure      34
                   Fighting       14
                   Misc           18
                   Platform       10
                   Racing         20
                   Role-Playing   40
                   Shooter        32
                   Simulation      9
```

```
          Sports            38
          Strategy          10
2017.0    Action             1
          Role-Playing       2
2020.0    Simulation         1
Length: 389, dtype: int64
```

In [13]: `df1.value_counts()`

```
Out[13]:   1      37
           2      25
           3      20
           4      13
           6       9
          29       8
          20       8
           5       8
          12       7
          14       7
          18       7
           8       6
          11       6
          23       6
          22       6
          42       5
          71       5
          19       5
          43       5
          25       4
          53       4
          16       4
          54       4
         103       4
          15       4
          13       4
          10       4
           9       4
           7       4
          50       3
                  ..
         239       1
         226       1
         211       1
         201       1
         154       1
         166       1
         167       1
         207       1
         108       1
         123       1
          87       1
          73       1
          70       1
          69       1
          64       1
         266       1
          59       1
          56       1
          86       1
          52       1
         115       1
          88       1
          47       1
          90       1
          94       1
          95       1
```

```
106     1
110     1
112     1
272     1
Length: 119, dtype: int64
```

In [14]: `df1.nlargest()`

Out[14]:
```
Year     Genre
2009.0   Action    272
2012.0   Action    266
2015.0   Action    255
2011.0   Action    239
2010.0   Action    226
dtype: int64
```

In [15]: `df1.nlargest(1)`

Out[15]:
```
Year     Genre
2009.0   Action    272
dtype: int64
```

In [16]:
```python
#5 Solution

x=df['NA_Sales'].sum()
y=df['EU_Sales'].sum()
z=df['JP_Sales'].sum()
print (x)
print (y)
print (z)
```

```
4392.950000000332
2434.13000000055
1291.0199999999018
```

In [17]:
```python
res6=min(x,y,z)
res6
```

Out[17]: `1291.0199999999018`

In [18]:
```python
if res6==x:
    print ("NA_Sales")
elif res6==y:
    print ("EU_Sales")
else:
    print ("JP_Sales")
```

```
JP_Sales
```