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

In [12]:
```
1 !pip3 install numpy
```

```
Requirement already satisfied: numpy in /home/placement/.local/lib/python3.8/site-packages (1.24.3)
```

In [2]:
```
1 data=pd.read_csv('movies.csv')
```

In [3]:
```
1 data.head()
```

Out[3]:

	srno	movie	year	rating	time
0	1	The Nightmare Before	1993	3.9	4568.0
1	2	The Mummy	1932	3.5	4388.0
2	3	Orphans of the Storm	1921	3.2	9062.0
3	4	The Object of Beauty	1991	2.8	6150.0
4	5	Night Tide	1963	2.8	5126.0

In [4]:
```
1 data.describe()
```

Out[4]:

	srno	year	rating	time
count	49590.000000	49590.000000	10814.000000	45836.000000
mean	24795.500000	2002.303428	3.451248	2628.445436
std	14315.544261	12.534555	0.495601	1604.646265
min	1.000000	1913.000000	1.400000	52.000000
25%	12398.250000	1999.000000	3.100000	1356.000000
50%	24795.500000	2007.000000	3.500000	2563.000000
75%	37192.750000	2010.000000	3.800000	2877.000000
max	49590.000000	2014.000000	4.500000	28813.000000

In [5]:
```
1 data.isna().sum()
```

Out[5]:
```
srno          0
movie         0
year          0
rating    38776
time       3754
dtype: int64
```

In [6]:
```
1 data.shape
```

Out[6]:
```
(49590, 5)
```

In [7]:
```
1 data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 49590 entries, 0 to 49589
Data columns (total 5 columns):
 #   Column  Non-Null Count  Dtype  
---  ------  --------------  -----  
 0   srno    49590 non-null  int64  
 1   movie   49590 non-null  object 
 2   year    49590 non-null  int64  
 3   rating  10814 non-null  float64
 4   time    45836 non-null  float64
dtypes: float64(2), int64(2), object(1)
memory usage: 1.9+ MB
```

In [8]:
```
1 data2=data.groupby(['year']).count()
```

In [9]:
```
1 data2
```

Out[9]:

year	srno	movie	rating	time
1913	3	3	3	3
1914	20	20	5	18
1915	1	1	1	1
1916	1	1	1	1
1918	1	1	1	1
...	...	...	...	...
2010	5107	5107	1102	4671
2011	5511	5511	1346	4992
2012	4339	4339	1130	3978
2013	981	981	345	901
2014	1	1	1	1

101 rows × 4 columns

In [11]:
```
1 data2.to_csv('movies1.csv')
```

In [13]:
```
1 data3=pd.read_csv("movies1.csv")
```

In [15]:
```
1 data3.head(50)
```

Out[15]:

	year	srno	movie	rating	time
0	1913	3	3	3	3
1	1914	20	20	5	18
2	1915	1	1	1	1
3	1916	1	1	1	1
4	1918	1	1	1	1
5	1919	3	3	3	3
6	1920	6	6	6	6
7	1921	2	2	2	2
8	1922	2	2	2	2
9	1923	4	4	4	4
10	1924	5	5	5	5
11	1925	5	5	5	5
12	1926	2	2	2	2
13	1927	4	4	4	4
14	1928	2	2	2	2
15	1929	5	5	5	5
16	1930	5	5	5	5
17	1931	3	3	3	3
18	1932	4	4	3	4
19	1933	7	7	3	7
20	1934	8	8	2	8
21	1935	11	11	8	11
22	1936	7	7	2	7
23	1937	4	4	4	4

	year	srno	movie	rating	time
24	1938	5	5	4	5
25	1939	6	6	5	6
26	1940	9	9	8	9
27	1941	7	7	7	7
28	1942	3	3	3	3
29	1943	7	7	6	7
30	1944	10	10	10	10
31	1945	9	9	9	9
32	1946	6	6	5	6
33	1947	9	9	8	9
34	1948	13	13	13	13
35	1949	9	9	8	9
36	1950	10	10	10	10
37	1951	33	33	9	31
38	1952	15	15	14	15
39	1953	17	17	17	17
40	1954	17	17	17	17
41	1955	14	14	14	13
42	1956	60	60	21	59
43	1957	98	98	24	95
44	1958	73	73	22	70
45	1959	87	87	12	84
46	1960	123	123	23	119
47	1961	119	119	17	115
48	1962	124	124	20	121
49	1963	88	88	24	85

In [17]:
```
1 import matplotlib
```

```
---------------------------------------------------------------------------
ModuleNotFoundError                       Traceback (most recent call last)
Cell In[17], line 1
----> 1 import matplotlib

ModuleNotFoundError: No module named 'matplotlib'
```

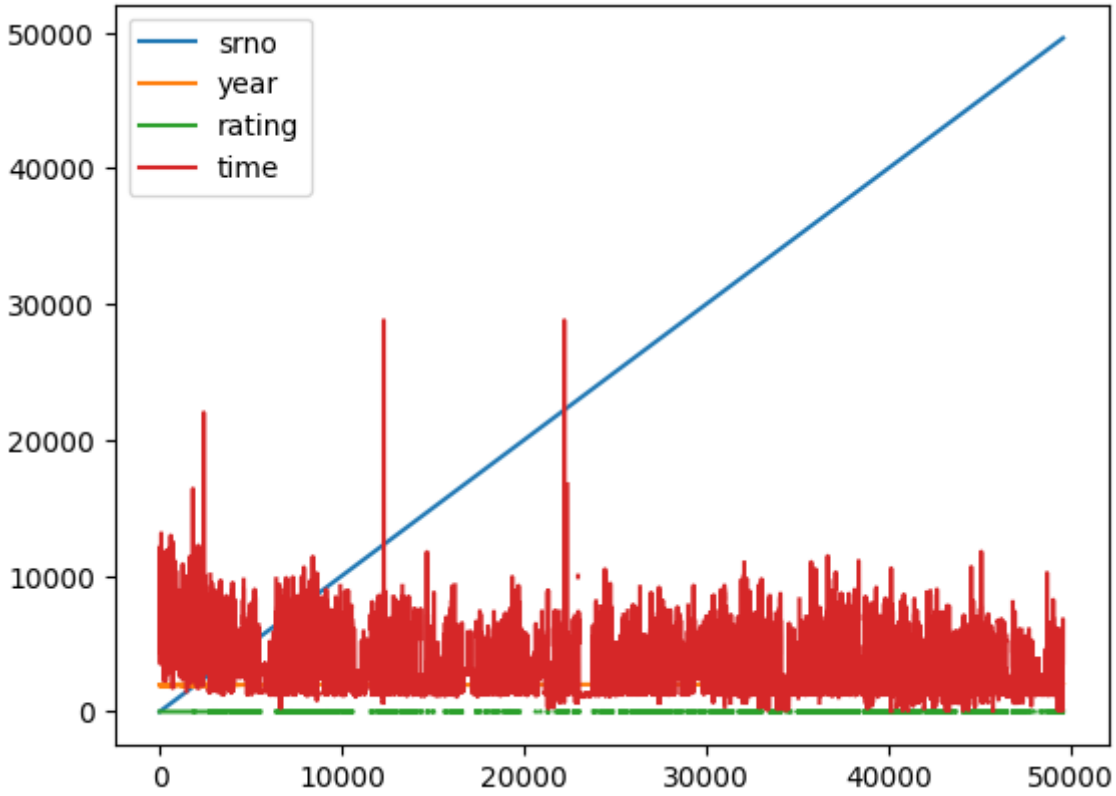
In [18]:
```
1 !pip3 install matplotlib
```

```
Collecting matplotlib
  Downloading matplotlib-3.7.1-cp38-cp38-manylinux_2_12_x86_64.manylinux2010_x86_64.whl (9.2 MB)
     |████████████████████████████████| 9.2 MB 154 kB/s eta 0:00:01
Requirement already satisfied: packaging>=20.0 in /home/placement/.local/lib/python3.8/site-packages (from
matplotlib) (23.1)
Collecting cycler>=0.10
  Downloading cycler-0.11.0-py3-none-any.whl (6.4 kB)
Requirement already satisfied: importlib-resources>=3.2.0; python_version < "3.10" in /home/placement/.loca
l/lib/python3.8/site-packages (from matplotlib) (5.12.0)
Collecting pyparsing>=2.3.1
  Downloading pyparsing-3.0.9-py3-none-any.whl (98 kB)
     |████████████████████████████████| 98 kB 255 kB/s eta 0:00:01
Collecting kiwisolver>=1.0.1
  Downloading kiwisolver-1.4.4-cp38-cp38-manylinux_2_5_x86_64.manylinux1_x86_64.whl (1.2 MB)
     |████████████████████████████████| 1.2 MB 1.3 MB/s eta 0:00:01
Requirement already satisfied: pillow>=6.2.0 in /usr/lib/python3/dist-packages (from matplotlib) (7.0.0)
Collecting contourpy>=1.0.1
  Downloading contourpy-1.1.0-cp38-cp38-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (300 kB)
     |████████████████████████████████| 300 kB 1.4 MB/s eta 0:00:01
Collecting fonttools>=4.22.0
  Downloading fonttools-4.40.0-cp38-cp38-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (4.4 MB)
     |████████████████████████████████| 4.4 MB 316 kB/s eta 0:00:01
Requirement already satisfied: python-dateutil>=2.7 in /home/placement/.local/lib/python3.8/site-packages
(from matplotlib) (2.8.2)
Requirement already satisfied: numpy>=1.20 in /home/placement/.local/lib/python3.8/site-packages (from matp
lotlib) (1.24.3)
Requirement already satisfied: zipp>=3.1.0; python_version < "3.10" in /home/placement/.local/lib/python3.
8/site-packages (from importlib-resources>=3.2.0; python_version < "3.10"->matplotlib) (3.15.0)
Requirement already satisfied: six>=1.5 in /usr/lib/python3/dist-packages (from python-dateutil>=2.7->matpl
otlib) (1.14.0)
Installing collected packages: cycler, pyparsing, kiwisolver, contourpy, fonttools, matplotlib
Successfully installed contourpy-1.1.0 cycler-0.11.0 fonttools-4.40.0 kiwisolver-1.4.4 matplotlib-3.7.1 pyp
arsing-3.0.9
```

In [19]:
```
1 import matplotlib as pyplot
```

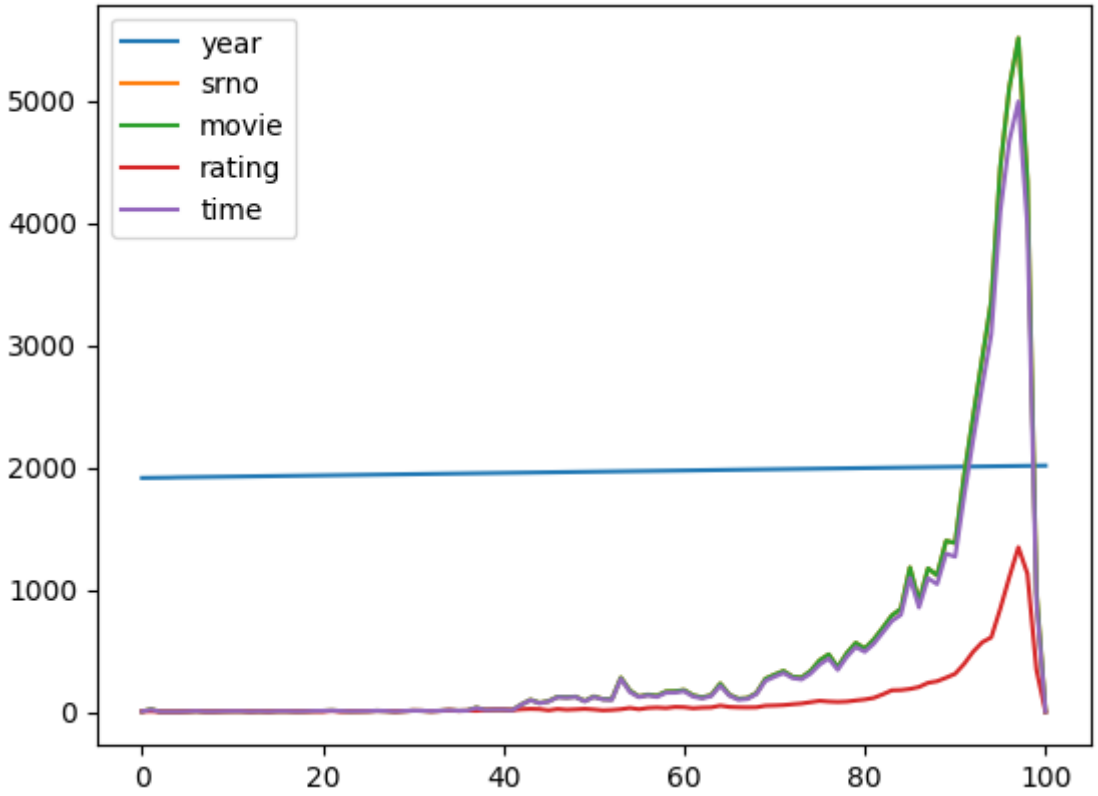
In [20]:
```
1 data.plot()
```

Out[20]: <Axes: >



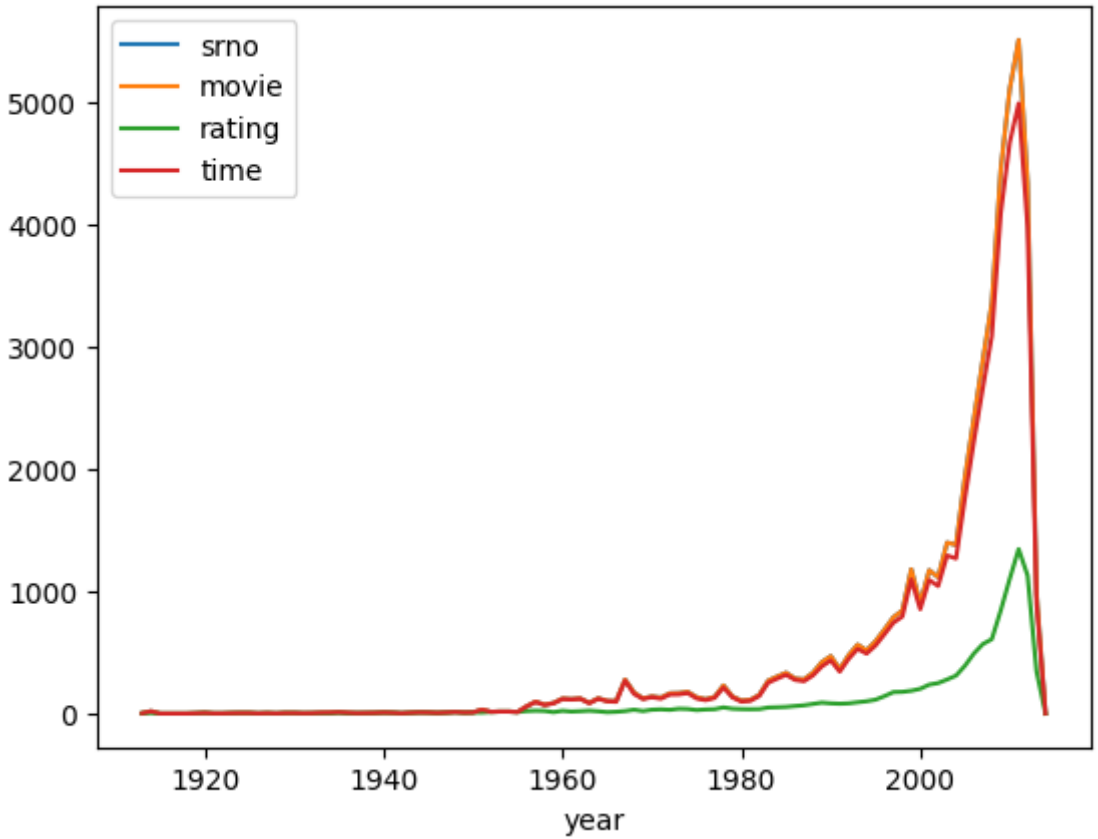
In [21]:
```
1 data3.plot()
```

Out[21]: <Axes: >



In [33]:
```
1 data2.plot()
```

Out[33]: <Axes: xlabel='year'>



In [40]:
```
1 import warnings
```

In [41]:
```
1 warnings.filterwarnings("ignore")
```