In [1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

How does the code perform?

In [2]:
```
pf = pd.read_csv('perf.csv')
pf = pf[['nlines','processed_time']]
```

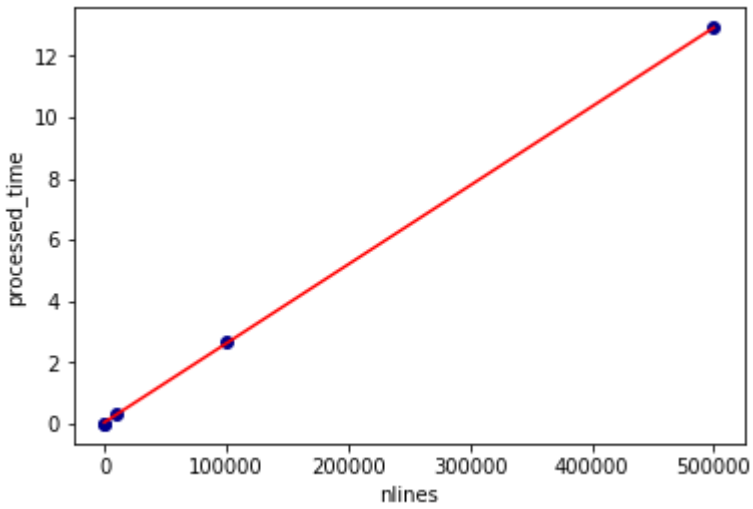
In [3]:
```
lm = np.polyfit(pf.nlines, pf.processed_time, 1)
lm
```

Out[3]:
```
array([  2.57848333e-05,   3.17044523e-02])
```

In [4]:
```
x = np.arange(0,510000,100000)
y = x*lm[0] + lm[1]
```

In [5]:
```
pf.plot.scatter(x='nlines', y='processed_time',  c='DarkBlue', s=35)
plt.plot(x, y, '-', c='Red')
```

Out[5]:
```
[<matplotlib.lines.Line2D at 0x9f52438>]
```



Because the performance scales linearly, one can split a large file into many smaller files, and process them in parallel and distributed way.

Discover drug?

In [6]:
```
df = pd.read_csv('top_cost_drug-500k.txt')
```

In [8]:
```
df.head()
```

Out[8]:

	drug_name	num_prescriber	total_cost
0	HARVONI	135	1.503435e+08
1	CRESTOR	2766	5.272927e+07
2	REVLIMID	147	5.111972e+07
3	LANTUS SOLOSTAR	2068	4.904834e+07
4	SPIRIVA	2176	4.790845e+07

In [10]:
```
df[df['num_prescriber'] < 1]
```

Out[10]:

	drug_name	num_prescriber	total_cost	avg_cost

In [11]:
```
df['avg_cost'] = df.total_cost / df.num_prescriber
```

Most costly

In [12]:
```
df.sort_values('total_cost', ascending=False).head(10)
```

Out[12]:

	drug_name	num_prescriber	total_cost	avg_cost
0	HARVONI	135	1.503435e+08	1.113655e+06
1	CRESTOR	2766	5.272927e+07	1.906337e+04
2	REVLIMID	147	5.111972e+07	3.477532e+05
3	LANTUS SOLOSTAR	2068	4.904834e+07	2.371777e+04
4	SPIRIVA	2176	4.790845e+07	2.201675e+04
5	ADVAIR DISKUS	2435	4.659865e+07	1.913702e+04
6	JANUVIA	2005	4.090811e+07	2.040305e+04
7	RENVELA	484	4.059754e+07	8.387922e+04
8	LANTUS	1892	3.731856e+07	1.972440e+04
9	NEXIUM	2248	3.543758e+07	1.576405e+04

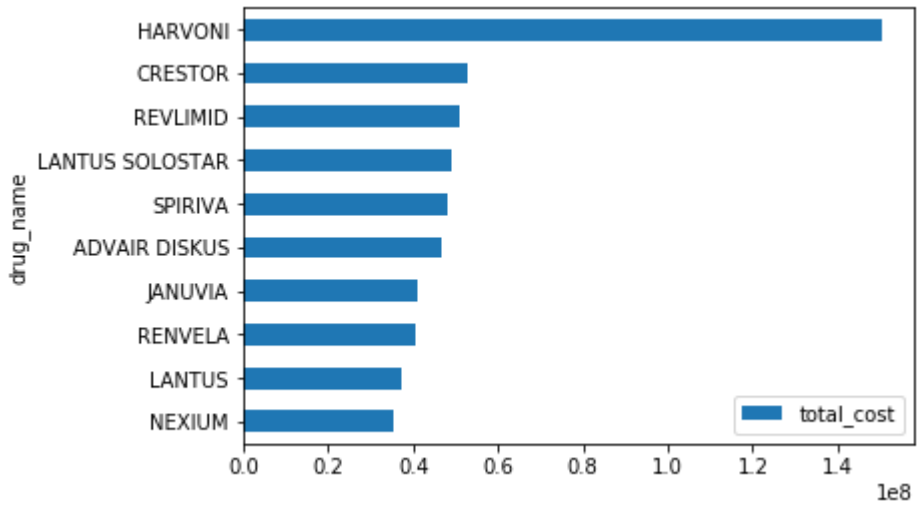
In [13]:
```
x=df.head(10)[['drug_name','total_cost']].sort_index(ascending=False)
x
```

Out[13]:

	drug_name	total_cost
9	NEXIUM	3.543758e+07
8	LANTUS	3.731856e+07
7	RENVELA	4.059754e+07
6	JANUVIA	4.090811e+07
5	ADVAIR DISKUS	4.659865e+07
4	SPIRIVA	4.790845e+07
3	LANTUS SOLOSTAR	4.904834e+07
2	REVLIMID	5.111972e+07
1	CRESTOR	5.272927e+07
0	HARVONI	1.503435e+08

In [14]:
```
x.plot.barh(x='drug_name',y='total_cost')
```

Out[14]:
```
<matplotlib.axes._subplots.AxesSubplot at 0xa3e8898>
```



What is Harvoni?

https://www.drugs.com/harvoni.html (https://www.drugs.com/harvoni.html)

Most popular

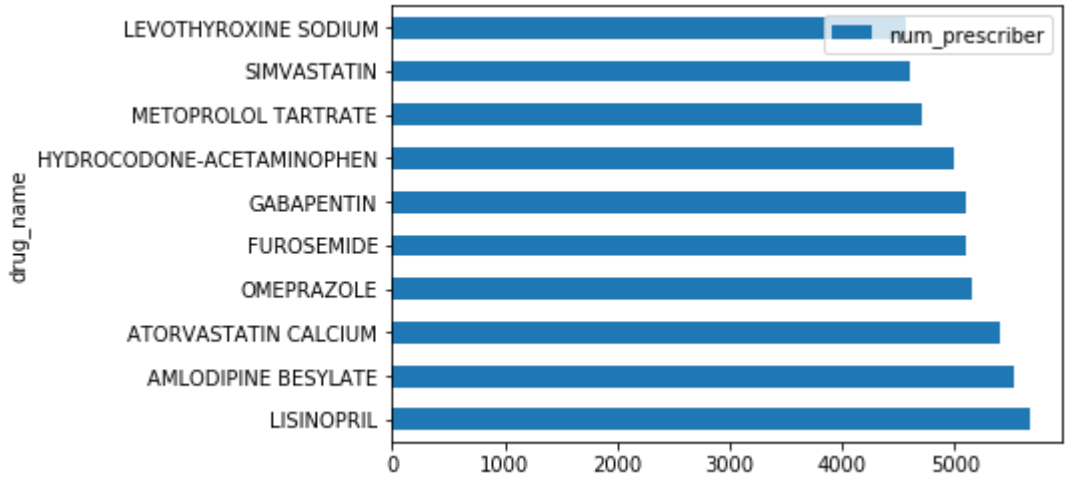
In [15]:
```
x2 = df.sort_values('num_prescriber', ascending=False).head(10)
x2
```

Out[15]:

	drug_name	num_prescriber	total_cost	avg_cost
93	LISINOPRIL	5673	5145472.17	907.010783
87	AMLODIPINE BESYLATE	5530	5499132.33	994.418143
31	ATORVASTATIN CALCIUM	5409	13827391.89	2556.367515
56	OMEPRAZOLE	5157	8627224.19	1672.915298
154	FUROSEMIDE	5095	3050446.12	598.713664
47	GABAPENTIN	5091	9950945.27	1954.615060
33	HYDROCODONE-ACETAMINOPHEN	4987	13659217.23	2738.964754
149	METOPROLOL TARTRATE	4708	3118313.12	662.343483
94	SIMVASTATIN	4596	5090509.68	1107.595666
28	LEVOTHYROXINE SODIUM	4574	14377096.90	3143.221885

In [16]:
```
x2.plot.barh(x='drug_name',y='num_prescriber')
```

Out[16]:
```
<matplotlib.axes._subplots.AxesSubplot at 0xa47f6d8>
```



What is LISINOPRIL?

https://www.drugs.com/LISINOPRIL.html (https://www.drugs.com/LISINOPRIL.html)

Exotic?

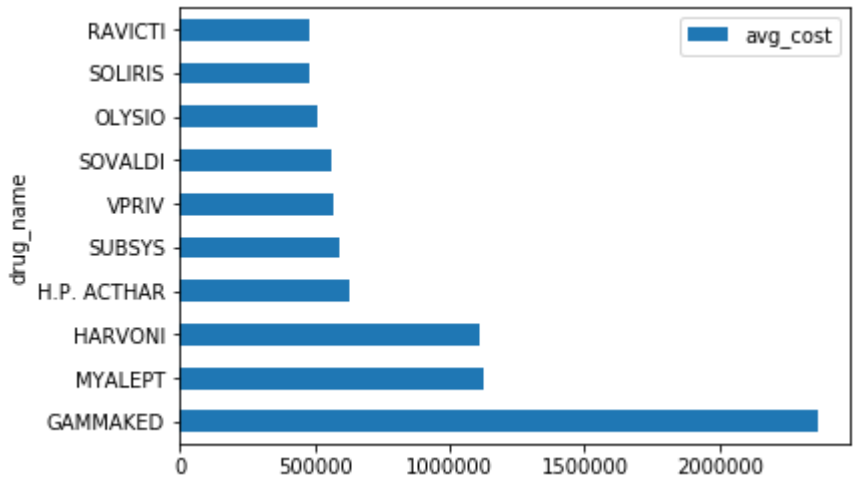
In [17]:
```
x3 = df.sort_values('avg_cost', ascending=False).head(10)
x3
```

Out[17]:

	drug_name	num_prescriber	total_cost	avg_cost
188	GAMMAKED	1	2.365574e+06	2.365574e+06
307	MYALEPT	1	1.125671e+06	1.125671e+06
0	HARVONI	135	1.503435e+08	1.113655e+06
148	H.P. ACTHAR	5	3.150904e+06	6.301808e+05
133	SUBSYS	6	3.562756e+06	5.937926e+05
454	VPRIV	1	5.670470e+05	5.670470e+05
18	SOVALDI	41	2.291109e+07	5.588071e+05
178	OLYSIO	5	2.556003e+06	5.112006e+05
344	SOLIRIS	2	9.632377e+05	4.816189e+05
494	RAVICTI	1	4.806375e+05	4.806375e+05

In [18]:
```
x3.plot.barh(x='drug_name',y='avg_cost')
```

Out[18]:
```
<matplotlib.axes._subplots.AxesSubplot at 0xa369390>
```



What is GAMMAKED?

http://www.gammaked.com/patients-caregivers/about-gammaked/
(http://www.gammaked.com/patients-caregivers/about-gammaked/)

In [ ]:

In [ ]: