Plots for census experiments

January 29, 2018

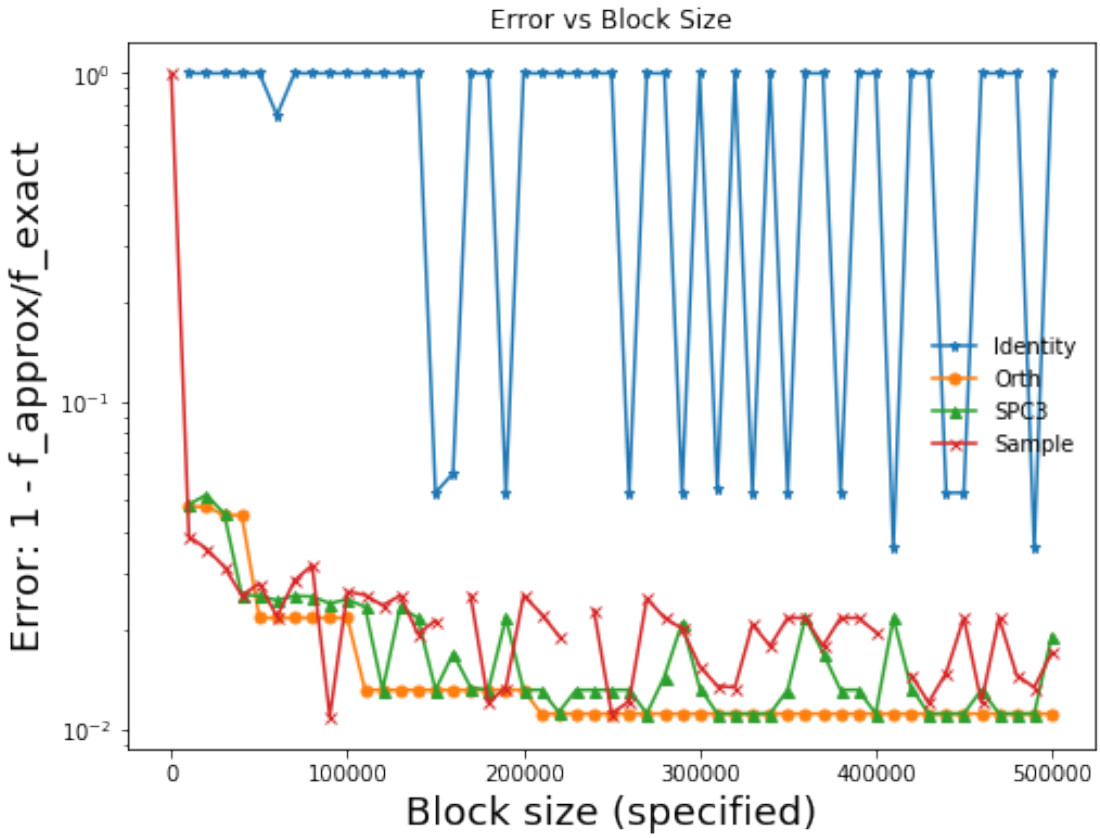
Python code to generate the plots from the matlab experiments.

In [1]:
```
import scipy.io as spio
import matplotlib.pyplot as plt
%matplotlib inline
```

In [2]:
```
mat_identity = spio.loadmat('../scripts/census_identity.mat', squeeze_me=True)
mat_orth = spio.loadmat('../scripts/census_orth.mat', squeeze_me=True)
mat_spc3 = spio.loadmat('../scripts/census_condition_spc3.mat', squeeze_me=True)
mat_uniform = spio.loadmat('../scripts/census_uniform_sampling.mat', squeeze_me=True)
```

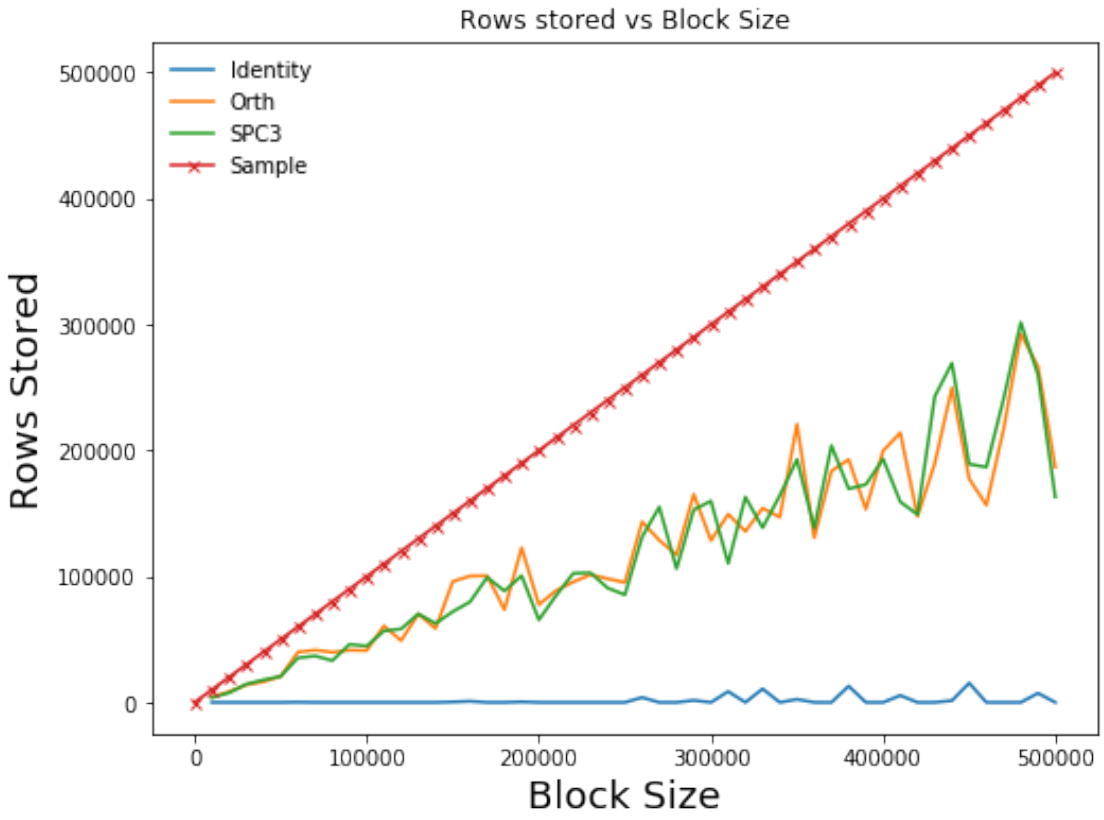
In [13]:
```
fig, ax = plt.subplots(figsize=(8,6))

ax.plot( mat_identity['block_sizes'], mat_identity['error'] , marker = '*', markersize
ax.plot( mat_orth['block_sizes'], mat_orth['error'], marker = 'o', markersize=5, label
ax.plot( mat_spc3['block_sizes'], mat_spc3['error'],  marker = '^', markersize=5, labe
ax.plot( mat_uniform['block_sizes'], mat_uniform['error'], marker='x', markersize=5, l
ax.set_yscale('log')
#ax.set_xscale('log')
ax.set_ylabel('Error: 1 - f_approx/f_exact', fontsize=18)
ax.set_xlabel('Block size (specified)', fontsize=18)
ax.set_title("Error vs Block Size")
ax.legend(loc=0, frameon=False)
```

Out[13]:
```
<matplotlib.legend.Legend at 0x1200a37f0>
```



In [15]:
```
fig, ax = plt.subplots(figsize=(8,6))

ax.plot( mat_identity['block_sizes'], mat_identity['storage'], label = 'Identity')
ax.plot( mat_orth['block_sizes'], mat_orth['storage'], label = 'Orth')
ax.plot( mat_spc3['block_sizes'], mat_spc3['storage'], label = 'SPC3')
ax.plot( mat_uniform['block_sizes'], mat_uniform['block_sizes'], marker='x', markersi
#ax.set_yscale('log')
#ax.set_xscale('log')
ax.set_ylabel('Rows Stored', fontsize=18)
ax.set_xlabel('Block Size', fontsize=18)
ax.set_title("Rows stored vs Block Size")
ax.legend(loc=0, frameon=False)
```

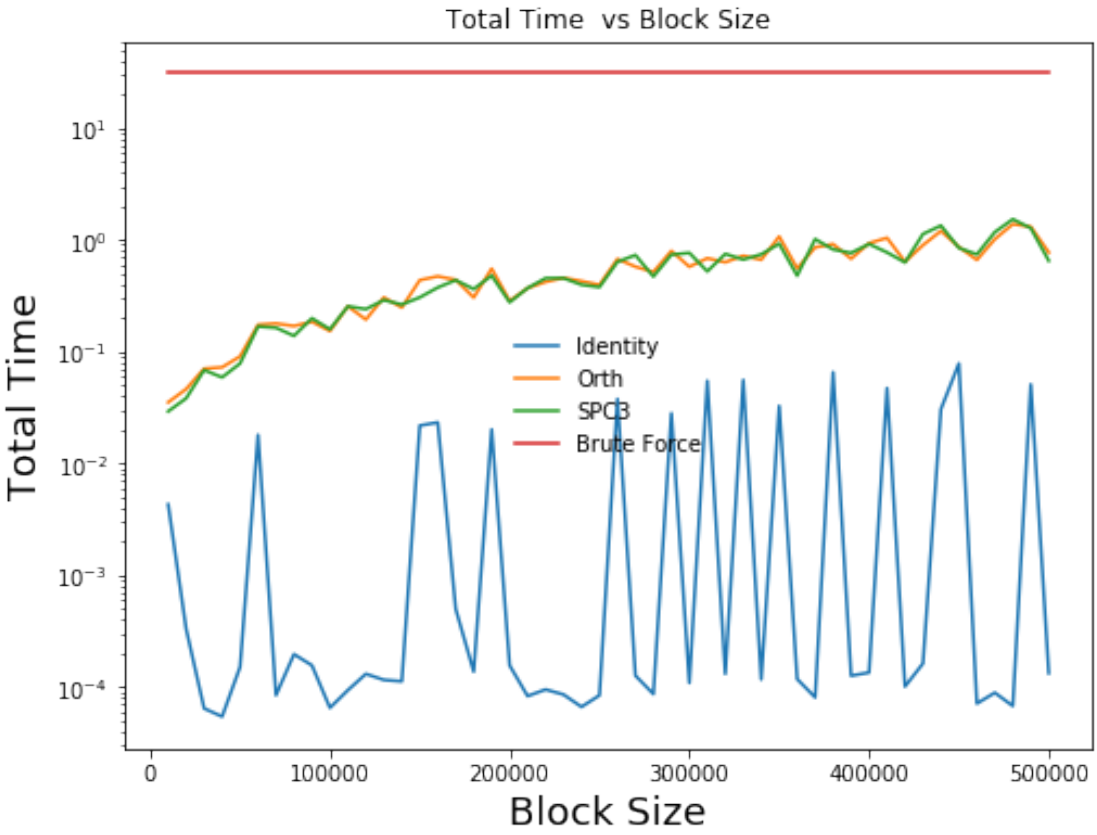
Out[15]:
```
<matplotlib.legend.Legend at 0x1204d9f60>
```



In [16]:
```
fig, ax = plt.subplots(figsize=(8,6))

ax.plot( mat_identity['block_sizes'], mat_identity['approx_regression_time'], label =
ax.plot( mat_orth['block_sizes'], mat_orth['approx_regression_time'], label = 'Orth')
ax.plot( mat_spc3['block_sizes'], mat_spc3['approx_regression_time'], label = 'SPC3')
ax.plot( mat_uniform['block_sizes'], mat_uniform['approx_regression_time'], marker='x
#ax.set_yscale('log')
#ax.set_xscale('log')
ax.set_ylabel('Time to solve regression', fontsize=18)
ax.set_xlabel('Block Size', fontsize=18)
ax.set_title("Time to solve regression vs Block Size")
ax.legend(loc=0, frameon=False)
```

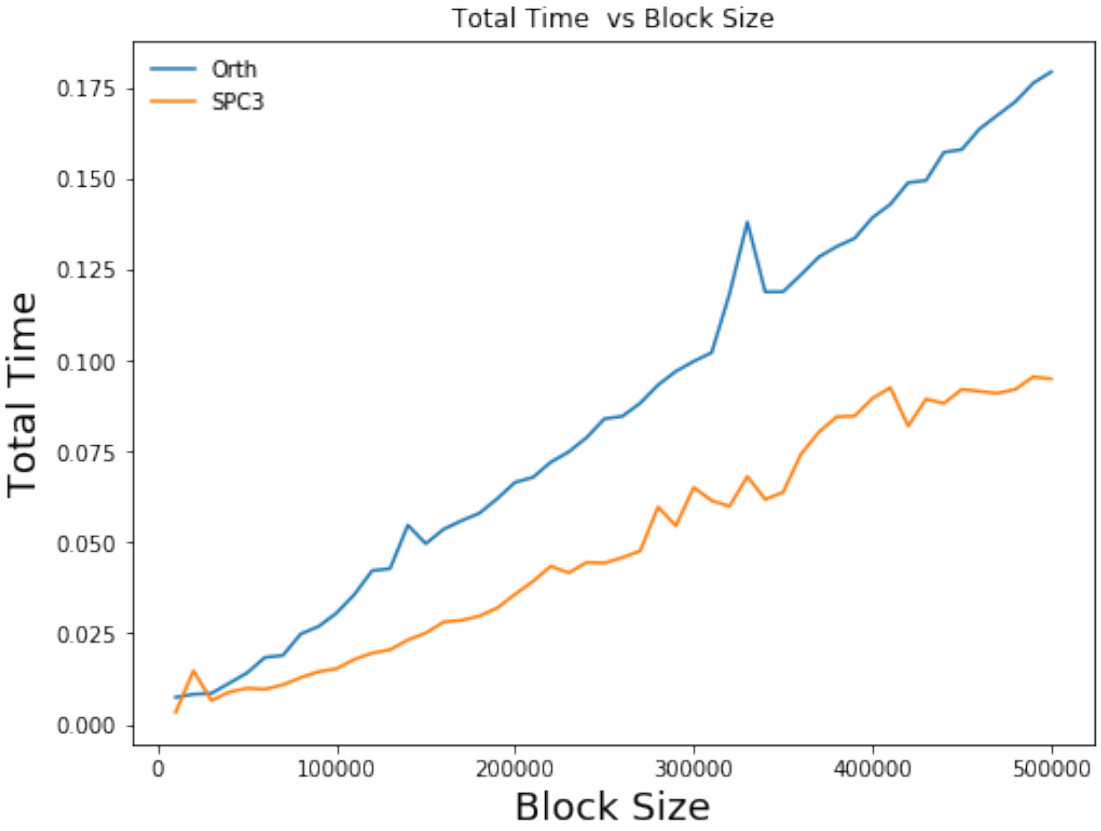
Out[16]:
```
<matplotlib.legend.Legend at 0x1206e9be0>
```


```
In [20]: fig, ax = plt.subplots(figsize=(8,6))

         ax.plot( mat_identity['block_sizes'], mat_identity['total_time'], label = 'Identity')
         ax.plot( mat_orth['block_sizes'], mat_orth['total_time'], label = 'Orth')
         ax.plot( mat_spc3['block_sizes'], mat_spc3['total_time'], label = 'SPC3')
         ax.plot(mat_spc3['block_sizes'], mat_spc3['full_regression_time'], label = 'Brute For
         ax.set_yscale('log')
         #ax.set_xscale('log')
         ax.set_ylabel('Total Time', fontsize=18)
         ax.set_xlabel('Block Size', fontsize=18)
         ax.set_title("Total Time  vs Block Size")
         ax.legend(loc=0, frameon=False)

Out[20]: <matplotlib.legend.Legend at 0x120cd7320>
```



0.0.1 Basis times

```
In [26]: basis_orth = spio.loadmat('../scripts/census/basis_times/census_condition_spc3_basis_t
         basis_spc3 = spio.loadmat('../scripts/census/basis_times/census_orth_basis_times.mat'

In [28]: fig, ax = plt.subplots(figsize=(8,6))

         ax.plot( basis_orth['block_sizes'], basis_orth['time_for_basis'], label = 'Orth')
         ax.plot( basis_spc3['block_sizes'], basis_spc3['time_for_basis'], label = 'SPC3')
         #ax.set_yscale('log')
         #ax.set_xscale('log')
         ax.set_ylabel('Total Time', fontsize=18)
         ax.set_xlabel('Block Size', fontsize=18)
         ax.set_title("Total Time  vs Block Size")
         ax.legend(loc=0, frameon=False)

Out[28]: <matplotlib.legend.Legend at 0x1213d7d30>
```


Total Time vs Block Size
Orth
SPC3
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
Total Time
0
100000
200000
300000
400000
500000
Block Size