```
In [6]: y_mean_matrix_time = [12442.6,96087.7,1920828.3,17910933.2]
         fig, ax = plt.subplots()
         ax.plot(x, y_mean_matrix_time)
         ax.set_yscale('log')
         ax.set title('exp scale prepaging matrix size versus mean matrix mult time')
Out[6]: Text(0.5,1,'exp scale prepaging matrix_size versus mean matrix mult time')
          exp scale prepaging matrix_size versus mean matrix mult time
          107
          10°
          105
          10^{4}
                 100
                          200
                                   300
                                           400
                                                    500
In [7]:
         y_mean_combine_time = [12735.2,96379.4,1921164.4,17911401.9]
         fig, ax = plt.subplots()
         ax.plot(x, y_mean_combine_time)
         ax.set_yscale('log')
         ax.set_title('exp scale prepaging matrix_size versus mean matrixmult + mmap time')
Out[7]: Text(0.5,1,'exp scale prepaging matrix_size versus mean matrixmult + mmap time')
          exp scale prepaging matrix size versus mean matrixmult + mmap time
             107
             10<sup>6</sup>
             105
             104
```

In [4]: x = [64, 128, 256, 512]

100

200

300

400

500

and the second propagating matter and the second matter and the second propagating the second matter and the second propagating the second matter and the

```
ut[13]: Text(0.5,1,'linear scale prepaging matrix_size versus mean mmap time for demand paging')
```

```
linear scale prepaging matrix_size versus mean mmap time for demand paging
```

```
122.5 -

120.0 -

117.5 -

115.0 -

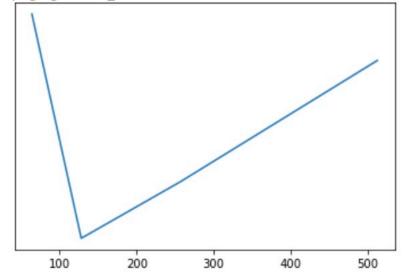
110.0 -

107.5 -
```

```
y_mean_matrix_mult_time_demand = [12988.7,105529.4,1959249.9,18099936.9]
fig, ax = plt.subplots()
ax.plot(x, y_mean_mmap_time_dmand)
ax.set_yscale('log')
ax.set_title('exp scale prepaging matrix_size versus mean matrix mult time for demand paging')
```

ut[12]: Text(0.5,1,'exp scale prepaging matrix_size versus mean matrix mult time for demand paging')

exp scale prepaging matrix_size versus mean matrix mult time for demand paging

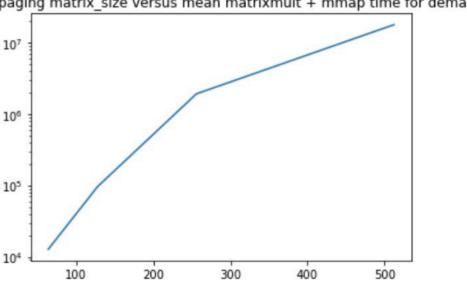


```
y_mean_combine_time_demand = y_mean_matrix_mult_time_demand+y_mean_mmap_time_dmand
fig, ax = plt.subplots()
ax.plot(x, y_mean_combine_time)
ax.set_yscale('log')
ax.set_title('exp scale prepaging matrix_size versus mean matrixmult + mmap time for demand paging')
```

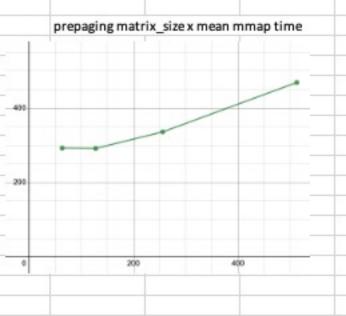
ut[16]: Text(0.5,1,'exp scale prepaging matrix_size versus mean matrixmult + mmap time for demand paging')

exp scale prepaging matrix_size versus mean matrixmult + mmap time for demand paging

Out[16]: Text(0.5,1,'exp scale prepaging matrix_size versus mean matrixmult + mmap time for demand paging



In [].



													V	
Dense64				dense128				dense256				dense512		
mmap	matrix	both		mmap	matrix	or 36,94 33		mmap	matrix	TOWNSTON ST. J.		mmap	matrix	West are
339	10794	11133		289	98202	98491		313	1938642	1938955		416	17798821	17799237
272	20611	20883		286	96068	96354		370	1910277	1910647		466	17967452	17967918
296	11491	11787		290	96430	96720		303	1921777	1922080		432	17970220	17970652
267	11298	11565		297	95180	95477		447	1917358	1917805		479	17917847	17918326
274	10727	11001		315	97020	97335		305	1914826	1915131		523	17809770	17810293
352	14655	15007		281	94707	94988		317	1924855	1925172		443	17949522	17949965
298	11146	11444		270	96800	97070		305	1917751	1918056		477	17798192	17798669
276	11185	11461		286	95165	95451		372	1911524	1911896		497	17915959	17916456
277	11749	12026		273	95173	95446		331	1931634	1931965		447	18064036	18064483
275	10770	11045		330	96132	96462		298	1919639	1919937		507	17917513	17918020
29.77023122	3091.847531	3091.946341	stdv	18.4032002	1074.173693	1077.853443	stdv	47.30856159	8869.799773	8853.327538	stdv	34.40623329	86454.18307	86445.58166
267	10727	11001	min	270	94707	94988	min	298	1910277	1910647	min	416	17798192	17798669
352	20611	20883	max	330	98202	98491	max	447	1938642	1938955	max	523	18064036	18064483
292.6	12442.6	12735.2	mean	291.7	96087.7	96379.4	mean	336.1			mean	468.7	17910933.2	17911401.9
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	339 272 296 267 274 352 298 276 277 275 29.77023122 267 352 292.6	mmap matrix 339 10794 272 20611 296 11491 267 11298 274 10727 352 14655 298 11146 276 11185 277 11749 275 10770 29.77023122 3091.847531 267 10727 352 20611 292.6 12442.6	mmap matrix both 339 10794 11133 272 20611 20883 296 11491 11787 267 11298 11565 274 10727 11001 352 14655 15007 298 11146 11444 276 11185 11461 277 11749 12026 275 10770 11045 29.77023122 3091.847531 3091.946341 267 10727 11001 352 20611 20883 292.6 12442.6 12735.2	mmap matrix both 339 10794 11133 272 20611 20883 296 11491 11787 267 11298 11565 274 10727 11001 352 14655 15007 298 11146 11444 276 11185 11461 277 11749 12026 275 10770 11045 29.77023122 3091.847531 3091.946341 stdv 267 10727 11001 min 352 20611 20883 max 292.6 12442.6 12735.2 mean	mmap matrix both mmap 339 10794 11133 289 272 20611 20883 286 296 11491 11787 290 267 11298 11565 297 274 10727 11001 315 352 14655 15007 281 298 11146 11444 270 276 11185 11461 286 277 11749 12026 273 275 10770 11045 330 29.77023122 3091.847531 3091.946341 stdv 18.4032002 267 10727 11001 min 270 352 20611 20883 max 330 292.6 12442.6 12735.2 mean 291.7	mmap matrix both mmap matrix 339 10794 11133 289 98202 272 20611 20883 286 96068 296 11491 11787 290 96430 267 11298 11565 297 95180 274 10727 11001 315 97020 352 14655 15007 281 94707 298 11146 11444 270 96800 276 11185 11461 286 95165 277 11749 12026 273 95173 275 10770 11045 330 96132 29.77023122 3091.847531 3091.946341 stdv 18.4032002 1074.173693 267 10727 11001 min 270 94707 352 20611 20883 max 330 98202 292.6 12442.6 12735.2 mean 291.7 <td>mmap matrix both mmap matrix 339 10794 11133 289 98202 98491 272 20611 20883 286 96068 96354 296 11491 11787 290 96430 96720 267 11298 11565 297 95180 95477 274 10727 11001 315 97020 97335 352 14655 15007 281 94707 94988 298 11146 11444 270 96800 97070 276 11185 11461 286 95165 95451 277 11749 12026 273 95173 95446 275 10770 11045 330 96132 96462 29.77023122 3091.847531 3091.946341 stdv 18.4032002 1074.173693 1077.853443 352 20611 20883 max 330 98202 98491</td> <td>mmap matrix both mmap matrix 339 10794 11133 289 98202 98491 272 20611 20883 286 96068 96354 296 11491 11787 290 96430 96720 267 11298 11565 297 95180 95477 274 10727 11001 315 97020 97335 352 14655 15007 281 94707 94988 298 11146 11444 270 96800 97070 276 11185 11461 286 95165 95451 277 11749 12026 273 95173 95446 275 10770 11045 330 96132 96462 29.77023122 3091.847531 3091.946341 stdv 18.4032002 1074.173693 1077.853443 stdv 267 10727 11001 min 270 94707</td> <td>mmap matrix both mmap matrix mmap 339 10794 11133 289 98202 98491 313 272 20611 20883 286 96068 96354 370 296 11491 11787 290 96430 96720 303 267 11298 11565 297 95180 95477 447 274 10727 11001 315 97020 97335 305 352 14655 15007 281 94707 94988 317 298 11146 11444 270 96800 97070 305 276 11185 11461 286 95165 95451 372 277 11749 12026 273 95173 95446 331 275 10770 11045 330 96132 96462 298 29.77023122 3091.847531 3091.946341 stdv 18.4032002</td> <td>mmap matrix both mmap matrix mmap matrix 339 10794 11133 289 98202 98491 313 1938642 272 20611 20883 286 96068 96354 370 1910277 296 11491 11787 290 96430 96720 303 1921777 267 11298 11565 297 95180 95477 447 1917358 274 10727 11001 315 97020 97335 305 1914826 352 14655 15007 281 94707 94988 317 1924855 298 11146 11444 270 96800 97070 305 1917751 275 11749 12026 273 95173 95446 331 1931634 275 10770 11045 330 96132 96462 298 1919639 29.77023122 3091.847531</td> <td>mmap matrix both mmap matrix mmap matrix 339 10794 11133 289 98202 98491 313 1938642 1938955 272 20611 20883 286 96068 96354 370 1910277 1910647 296 11491 11787 290 96430 96720 303 1921777 1922080 267 11298 11565 297 95180 95477 447 1917358 1917805 274 10727 11001 315 97020 97335 305 1914826 1915131 352 14655 15007 281 94707 94988 317 1924855 1925172 298 11146 11444 270 96800 97070 305 1917751 1918056 277 11749 12026 273 95173 95446 331 1931634 1931634 1931634 1931965 29</td> <td>mmap matrix both mmap matrix mmatrix mmatrix mmatrix mmatrix mmatrix mmatrix mmatrix mmatrix mp10cm mmatrix mp10cm mmatrix mp10cm mp10cm mp10cm mp10cm <</td> <td>mmap matrix both mmap matrix mmap m</td> <td>mmap matrix both mmap matrix 17798221 416 17798221 416 17798221 416 17798221 416 17798221 416 17798221 41797222 4179722 41797222 41797222</td>	mmap matrix both mmap matrix 339 10794 11133 289 98202 98491 272 20611 20883 286 96068 96354 296 11491 11787 290 96430 96720 267 11298 11565 297 95180 95477 274 10727 11001 315 97020 97335 352 14655 15007 281 94707 94988 298 11146 11444 270 96800 97070 276 11185 11461 286 95165 95451 277 11749 12026 273 95173 95446 275 10770 11045 330 96132 96462 29.77023122 3091.847531 3091.946341 stdv 18.4032002 1074.173693 1077.853443 352 20611 20883 max 330 98202 98491	mmap matrix both mmap matrix 339 10794 11133 289 98202 98491 272 20611 20883 286 96068 96354 296 11491 11787 290 96430 96720 267 11298 11565 297 95180 95477 274 10727 11001 315 97020 97335 352 14655 15007 281 94707 94988 298 11146 11444 270 96800 97070 276 11185 11461 286 95165 95451 277 11749 12026 273 95173 95446 275 10770 11045 330 96132 96462 29.77023122 3091.847531 3091.946341 stdv 18.4032002 1074.173693 1077.853443 stdv 267 10727 11001 min 270 94707	mmap matrix both mmap matrix mmap 339 10794 11133 289 98202 98491 313 272 20611 20883 286 96068 96354 370 296 11491 11787 290 96430 96720 303 267 11298 11565 297 95180 95477 447 274 10727 11001 315 97020 97335 305 352 14655 15007 281 94707 94988 317 298 11146 11444 270 96800 97070 305 276 11185 11461 286 95165 95451 372 277 11749 12026 273 95173 95446 331 275 10770 11045 330 96132 96462 298 29.77023122 3091.847531 3091.946341 stdv 18.4032002	mmap matrix both mmap matrix mmap matrix 339 10794 11133 289 98202 98491 313 1938642 272 20611 20883 286 96068 96354 370 1910277 296 11491 11787 290 96430 96720 303 1921777 267 11298 11565 297 95180 95477 447 1917358 274 10727 11001 315 97020 97335 305 1914826 352 14655 15007 281 94707 94988 317 1924855 298 11146 11444 270 96800 97070 305 1917751 275 11749 12026 273 95173 95446 331 1931634 275 10770 11045 330 96132 96462 298 1919639 29.77023122 3091.847531	mmap matrix both mmap matrix mmap matrix 339 10794 11133 289 98202 98491 313 1938642 1938955 272 20611 20883 286 96068 96354 370 1910277 1910647 296 11491 11787 290 96430 96720 303 1921777 1922080 267 11298 11565 297 95180 95477 447 1917358 1917805 274 10727 11001 315 97020 97335 305 1914826 1915131 352 14655 15007 281 94707 94988 317 1924855 1925172 298 11146 11444 270 96800 97070 305 1917751 1918056 277 11749 12026 273 95173 95446 331 1931634 1931634 1931634 1931965 29	mmap matrix both mmap matrix mmatrix mmatrix mmatrix mmatrix mmatrix mmatrix mmatrix mmatrix mp10cm mmatrix mp10cm mmatrix mp10cm mp10cm mp10cm mp10cm <	mmap matrix both mmap matrix mmap m	mmap matrix both mmap matrix 17798221 416 17798221 416 17798221 416 17798221 416 17798221 416 17798221 41797222 4179722 41797222 41797222

R	S	T	U	٧	W	X	Υ	Z	AA	AB	AC	AD	AE	AF	AG	
DEMAND	Dense64				dense128	10			dense256				dense512			7
PAGING	mmap	matrix			mmap	matrix	1		mmap	matrix			mmap	matrix		
	103	12647	12750		105	111147	111252		104	1998822	1998926		133	18076595	18076728	
	101	12664	12765		108	102563	102671		107	1972012	1972119		109	18071680	18071789	
	104	12495	12599		102	102118	102220		107	1948276	1948383		110	18269764	18269874	
	153	12216	12369		103	109881	109984		113	1940067	1940180		108	18080272	18080380	
	241	13767	14008		111	104063	104174		109	1937785	1937894		108	18100121	18100229	
	102	13060	13162		107	108502	108609		125	1946002	1946127		154	18103561	18103715	
	114	12965	13079		107	106001	106108		106	1958131	1958237		136	18008953	18009089	
	103	13261	13364		105	105113	105218		114	1977621	1977735		108	18004600	18004708	
	104	13023	13127		107	104027	104134		109	1956796	1956905		107	18197621	18197728	
	108	13789	13897		105	101879	101984		107	1956987	1957094		122	18086202	18086324	
	44.19162817	515.3417528	532.6067968		2.581988897	3298.08248	3297.669655		6.063552314	18866.11545	18863.81706		16.34523376	80057.23113	80053.14817	
	101	12216	12369		102	101879	101984		104	1937785	1937894		107	18004600	18004708	\equiv
	241	13789	14008		111	111147	111252		125	1998822	1998926		154	18269764	18269874	
	123.3	12988.7	13112		106	105529.4	105635.4		110.1	1959249.9	1959360		119.5	18099936.9	18100056.4	
							20									