In [2]:
```python
import pandas as pd # importing pandas = > useful for creating dataframes
import numpy as np
```

In [3]:
```python
x1 = [1, 2, 3, 4,5] # list format
x2 = [10, 11, 12,100,11]
```

In [4]:
```python
x1
```

Out[4]: [1, 2, 3, 4, 5]

In [5]:
```python
x3 = list(range(5))
```

In [6]:
```python
x3
```

Out[6]: [0, 1, 2, 3, 4]

In [7]:
```python
X = pd.DataFrame(columns = ["X1","X2","X3"])
X
```

Out[7]:

X1	X2	X3

In [7]:
```python
X["X1"] = pd.Series(x1)  # Converting list format into pandas series format
X["X2"] = pd.Series(x2) # Converting list format into pandas series format
X["X3"] = pd.Series(x3)
```

In [8]:
```python
X
```

Out[8]:

	X1	X2	X3
0	1	10	0
1	2	11	1
2	3	12	2
3	4	100	3
4	5	11	4

In [9]:
```python
X["X1"] = x1 # Converting list format into pandas series format
X["X2"] = x2 # Converting list format into pandas series format
X["X3"] = x3
```

In [8]:
```python
X
```

Out[8]:

X1	X2	X3

In [11]:
```python
X.X1
```

Out[11]:
```
0    1
1    2
2    3
3    4
4    5
Name: X1, dtype: int64
```

In [12]:
```python
X[["X1","X2"]]
```

Out[12]:

	X1	X2
0	1	10
1	2	11
2	3	12
3	4	100
4	5	11

In [13]:
```python
X.iloc[0:3,1]
```

Out[13]:
```
0    10
1    11
2    12
Name: X2, dtype: int64
```

In [9]:
```python
X.iloc[:,:]
```

Out[9]:

X1	X2	X3

In [15]:
```python
X.loc[0:3,["X1","X2"]]
```

Out[15]:

	X1	X2
0	1	10
1	2	11
2	3	12
3	4	100

In [16]:
```python
type(X.X1)
```

Out[16]: pandas.core.series.Series

In [17]:
```python
x = pd.DataFrame(columns=["A","B","C"])
```

In [18]:
```python
X
```

Out[18]:

	X1	X2	X3
0	1	10	0
1	2	11	1
2	3	12	2
3	4	100	3
4	5	11	4

In [19]:
```python
x["A"] = pd.Series(list(np.random.randint(1,100,50)))
```

In [20]:
```python
x
```

Out[20]:

	A	B	C
0	28	NaN	NaN
1	93	NaN	NaN
2	98	NaN	NaN
3	92	NaN	NaN
4	49	NaN	NaN
5	89	NaN	NaN
6	13	NaN	NaN
7	30	NaN	NaN
8	52	NaN	NaN
9	57	NaN	NaN
10	53	NaN	NaN
11	55	NaN	NaN
12	14	NaN	NaN
13	32	NaN	NaN
14	47	NaN	NaN
15	55	NaN	NaN
16	54	NaN	NaN
17	82	NaN	NaN
18	24	NaN	NaN
19	25	NaN	NaN
20	27	NaN	NaN
21	15	NaN	NaN
22	29	NaN	NaN
23	62	NaN	NaN
24	7	NaN	NaN
25	65	NaN	NaN
26	37	NaN	NaN
27	61	NaN	NaN
28	93	NaN	NaN
29	53	NaN	NaN
30	2	NaN	NaN
31	71	NaN	NaN
32	88	NaN	NaN
33	89	NaN	NaN
34	81	NaN	NaN
35	84	NaN	NaN
36	43	NaN	NaN
37	40	NaN	NaN
38	9	NaN	NaN
39	46	NaN	NaN
40	41	NaN	NaN
41	42	NaN	NaN
42	64	NaN	NaN
43	40	NaN	NaN
44	41	NaN	NaN
45	23	NaN	NaN
46	17	NaN	NaN
47	54	NaN	NaN
48	54	NaN	NaN
49	60	NaN	NaN

In [21]:
```python
x["B"] = pd.Series(list(np.random.choice([0,1],size = 50)))
```

In [22]:
```python
x
```

Out[22]:

	A	B	C
0	28	1	NaN
1	93	0	NaN
2	98	1	NaN
3	92	1	NaN
4	49	1	NaN
5	89	0	NaN
6	13	1	NaN
7	30	0	NaN
8	52	1	NaN
9	57	0	NaN
10	53	0	NaN
11	55	1	NaN
12	14	0	NaN
13	32	1	NaN
14	47	0	NaN
15	55	0	NaN
16	54	0	NaN
17	82	0	NaN
18	24	0	NaN
19	25	0	NaN
20	27	0	NaN
21	15	1	NaN
22	29	1	NaN
23	62	1	NaN
24	7	1	NaN
25	65	1	NaN
26	37	0	NaN
27	61	1	NaN
28	93	1	NaN
29	53	0	NaN
30	2	1	NaN
31	71	1	NaN
32	88	0	NaN
33	89	1	NaN
34	81	1	NaN
35	84	1	NaN
36	43	0	NaN
37	40	1	NaN
38	9	1	NaN
39	46	1	NaN
40	41	0	NaN
41	42	1	NaN
42	64	1	NaN
43	40	0	NaN
44	41	0	NaN
45	23	1	NaN
46	17	0	NaN
47	54	0	NaN
48	54	1	NaN
49	60	1	NaN

In [23]:
```python
x["C"] = 15
```

In [24]:
```python
x
```

Out[24]:

	A	B	C
0	28	1	15
1	93	0	15
2	98	1	15
3	92	1	15
4	49	1	15
5	89	0	15
6	13	1	15
7	30	0	15
8	52	1	15
9	57	0	15
10	53	0	15
11	55	1	15
12	14	0	15
13	32	1	15
14	47	0	15
15	55	0	15
16	54	0	15
17	82	0	15
18	24	0	15
19	25	0	15
20	27	0	15
21	15	1	15
22	29	1	15
23	62	1	15
24	7	1	15
25	65	1	15
26	37	0	15
27	61	1	15
28	93	1	15
29	53	0	15
30	2	1	15
31	71	1	15
32	88	0	15
33	89	1	15
34	81	1	15
35	84	1	15
36	43	0	15
37	40	1	15
38	9	1	15
39	46	1	15
40	41	0	15
41	42	1	15
42	64	1	15
43	40	0	15
44	41	0	15
45	23	1	15
46	17	0	15
47	54	0	15
48	54	1	15
49	60	1	15

In [10]:
```python
mba
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-10-60f45ea320a1> in <module>
----> 1 mba

NameError: name 'mba' is not defined
```

In [26]:
```python
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

In [28]:
```python
mba = pd.read_csv("file:///C:/Users/Mukesh/Downloads/mba.csv")
type(mba)
mba.head( 15)
mba.loc[1,["gmat"]]
```

```
---------------------------------------------------------------------------
FileNotFoundError                         Traceback (most recent call last)
~\Anaconda3\lib\urllib\request.py in open_local_file(self, req)
   1472         try:
-> 1473             stats = os.stat(localfile)
   1474             size = stats.st_size

FileNotFoundError: [WinError 3] The system cannot find the path specified: 'C:\\Users\\Mukesh\\Downloads\\mba.csv'

During handling of the above exception, another exception occurred:

URLError                                  Traceback (most recent call last)
<ipython-input-28-a5806ba05192> in <module>
----> 1 mba = pd.read_csv("file:///C:/Users/Mukesh/Downloads/mba.csv")
      2 type(mba)
      3 mba.head( 15)
      4 mba.loc[1,["gmat"]]

~\Anaconda3\lib\site-packages\pandas\io\parsers.py in parser_f(filepath_or_buffer, sep, delimiter, header, names, index_col, usecols, squeeze, prefix, mangle_dupe_cols, dtype, engine, converters, true_values, false_values, skipinitialspace, skiprows, skipfooter, nrows, na_values, keep_default_na, na_filter, verbose, skip_blank_lines, parse_dates, infer_datetime_format, keep_date_col, date_parser, dayfirst, cache_dates, iterator, chunksize, compression, thousands, decimal, lineterminator, quotechar, quoting, doublequote, escapechar, comment, encoding, dialect, error_bad_lines, warn_bad_lines, delim_whitespace, low_memory, memory_map, float_precision)
    683     )
    684 
--> 685     return _read(filepath_or_buffer, kwds)
    686 
    687     parser_f.__name__ = name

~\Anaconda3\lib\site-packages\pandas\io\parsers.py in _read(filepath_or_buffer, kwds)
    438     # See https://github.com/python/mypy/issues/1297
    439     fp_or_buf, _, compression, should_close = get_filepath_or_buffer(
--> 440         filepath_or_buffer, encoding, compression
    441     )
    442     kwds["compression"] = compression

~\Anaconda3\lib\site-packages\pandas\io\common.py in get_filepath_or_buffer(filepath_or_buffer, encoding, compression, mode)
    194 
    195     if _is_url(filepath_or_buffer):
--> 196         req = urlopen(filepath_or_buffer)
    197         content_encoding = req.headers.get("Content-Encoding", None)
    198         if content_encoding == "gzip":

~\Anaconda3\lib\urllib\request.py in urlopen(url, data, timeout, cafile, capath, cadefault, context)
    220     else:
    221         opener = _opener
--> 222     return opener.open(url, data, timeout)
    223 
    224 def install_opener(opener):

~\Anaconda3\lib\urllib\request.py in open(self, fullurl, data, timeout)
    523             req = meth(req)
    524 
--> 525         response = self._open(req, data)
    526 
    527         # post-process response

~\Anaconda3\lib\urllib\request.py in _open(self, req, data)
    541         protocol = req.type
    542         result = self._call_chain(self.handle_open, protocol, protocol +
--> 543                                   '_open', req)
    544         if result:
    545             return result

~\Anaconda3\lib\urllib\request.py in _call_chain(self, chain, kind, meth_name, *args)
    501         for handler in handlers:
    502             func = getattr(handler, meth_name)
--> 503             result = func(*args)
    504             if result is not None:
    505                 return result

~\Anaconda3\lib\urllib\request.py in file_open(self, req)
   1449                 raise URLError("file:// scheme is supported only on localhost")
   1450         else:
-> 1451             return self.open_local_file(req)
   1452 
   1453     # names for the localhost

~\Anaconda3\lib\urllib\request.py in open_local_file(self, req)
   1488                 return addinfourl(open(localfile, 'rb'), headers, origurl)
   1489         except OSError as exp:
-> 1490             raise URLError(exp)
   1491         raise URLError('file not on local host')
   1492 

URLError: <urlopen error [WinError 3] The system cannot find the path specified: 'C:\\Users\\Mukesh\\Downloads\\mba.csv'>
```

In [11]:
```python
mba =pd.read_csv("mba.csv")
```

In [12]:
```python
mba
```

Out[12]:

	datasrno	workex	gmat
0	1	21	720
1	2	107	640
2	3	57	740
3	4	99	690
4	5	208	710
...	...	...	...
768	769	68	620
769	770	132	670
770	771	28	610
771	772	10	610
772	773	52	620

773 rows × 3 columns

In [13]:
```python
pd.set_option("display.max_rows", 773)
```

In [32]: mba

Out[32]:

	datasrno	workex	gmat
0	1	21	720
1	2	107	640
2	3	57	740
3	4	99	690
4	5	208	710
5	6	136	660
6	7	70	660
7	8	103	710
8	9	78	700
9	10	22	730
10	11	69	700
11	12	41	740
12	13	72	650
13	14	69	720
14	15	20	700
15	16	21	760
16	17	19	710
17	18	86	720
18	19	231	690
19	20	20	770
20	21	175	660
21	22	21	710
22	23	44	720
23	24	23	650
24	25	20	710
25	26	70	720
26	27	46	710
27	28	33	650
28	29	130	690
29	30	57	690
30	31	57	750
31	32	45	710
32	33	55	730
33	34	42	770
34	35	34	690
35	36	55	710
36	37	44	710
37	38	79	710
38	39	45	740
39	40	38	720
40	41	44	710
41	42	83	720
42	43	118	650
43	44	45	710
44	45	89	690
45	46	77	700
46	47	91	730
47	48	61	690
48	49	47	670
49	50	69	710
50	51	59	720
51	52	32	710
52	53	74	740
53	54	279	750
54	55	33	710
55	56	33	730
56	57	34	730
57	58	110	710
58	59	44	710
59	60	44	690
60	61	46	720
61	62	58	690
62	63	45	710
63	64	34	720
64	65	54	770
65	66	45	720
66	67	33	740
67	68	82	710
68	69	72	740
69	70	77	710
70	71	43	740
71	72	54	740
72	73	92	730
73	74	90	720
74	75	66	760
75	76	38	720
76	77	25	740
77	78	57	740
78	79	31	710
79	80	58	690
80	81	55	710
81	82	68	710
82	83	79	730
83	84	71	700
84	85	68	710
85	86	32	750
86	87	32	710
87	88	45	710
88	89	69	720
89	90	65	680
90	91	57	710
91	92	45	710
92	93	92	710
93	94	57	740
94	95	69	710
95	96	32	710
96	97	70	700
97	98	59	690
98	99	44	770
99	100	44	770
100	101	46	720
101	102	33	730
102	103	46	710
103	104	82	720
104	105	53	690
105	106	33	740
106	107	34	690
107	108	37	690
108	109	55	750
109	110	52	720
110	111	68	670
111	112	51	690
112	113	69	710
113	114	47	690
114	115	56	750
115	116	45	710
116	117	56	680
117	118	48	690
118	119	34	730
119	120	55	750
120	121	43	700
121	122	69	720
122	123	31	680
123	124	46	690
124	125	58	700
125	126	47	740
126	127	56	710
127	128	43	730
128	129	58	720
129	130	27	720
130	131	46	740
131	132	58	680
132	133	34	670
133	134	34	730
134	135	45	680
135	136	68	710
136	137	34	740
137	138	46	760
138	139	45	710
139	140	56	710
140	141	33	710
141	142	33	730
142	143	44	680
143	144	33	690
144	145	69	720
145	146	82	730
146	147	64	750
147	148	126	770
148	149	80	750
149	150	80	720
150	151	45	710
151	152	45	700
152	153	68	720
153	154	58	720
154	155	45	690
155	156	130	710
156	157	80	730
157	158	130	710
158	159	34	740
159	160	80	690
160	161	48	630
161	162	45	730
162	163	40	720
163	164	58	710
164	165	35	690
165	166	40	690
166	167	79	730
167	168	34	710
168	169	56	720
169	170	68	710
170	171	32	740
171	172	57	710
172	173	53	650
173	174	57	760
174	175	45	680
175	176	46	700
176	177	77	710
177	178	44	690
178	179	68	720
179	180	45	740
180	181	54	710
181	182	58	710
182	183	59	730
183	184	38	660
184	185	94	710
185	186	46	710
186	187	96	710
187	188	44	740
188	189	50	690
189	190	91	610
190	191	117	700
191	192	58	690
192	193	32	760
193	194	57	730
194	195	57	700
195	196	57	720
196	197	32	710
197	198	33	750
198	199	41	690
199	200	70	750
200	201	45	660
201	202	68	740
202	203	90	710
203	204	82	730
204	205	33	750
205	206	46	710
206	207	45	710
207	208	45	710
208	209	79	680
209	210	109	720
210	211	53	710
211	212	44	700
212	213	33	740
213	214	70	690
214	215	44	710
215	216	51	760
216	217	85	720
217	218	57	710
218	219	66	710
219	220	44	700
220	221	50	690
221	222	30	750
222	223	33	690
223	224	89	710
224	225	55	710
225	226	128	710
226	227	45	710
227	228	33	710
228	229	35	720
229	230	33	710
230	231	58	660
231	232	49	650
232	233	57	710
233	234	45	700
234	235	63	730
235	236	81	700
236	237	56	710
237	238	45	690
238	239	86	760
239	240	45	740
240	241	69	750
241	242	43	710
242	243	45	730
243	244	70	710
244	245	33	740
245	246	43	710
246	247	34	720
247	248	47	690
248	249	57	690
249	250	70	700
250	251	93	700
251	252	92	710
252	253	32	710
253	254	80	720
254	255	33	760
255	256	32	710
256	257	55	690
257	258	46	700
258	259	66	710
259	260	65	710
260	261	42	720
261	262	71	720
262	263	41	760
263	264	30	730
264	265	45	730
265	266	91	720
266	267	46	740
267	268	44	740
268	269	74	710
269	270	45	710
270	271	112	720
271	272	46	700
272	273	69	710
273	274	32	770
274	275	69	760
275	276	44	740
276	277	69	700
277	278	45	650
278	279	81	740
279	280	82	710
280	281	44	690
281	282	34	700
282	283	46	730
283	284	34	720
284	285	43	720
285	286	69	710
286	287	34	720
287	288	32	760
288	289	45	740
289	290	50	710
290	291	57	720
291	292	50	680
292	293	58	720
293	294	92	690
294	295	131	710
295	296	45	650
296	297	64	700
297	298	48	700
298	299	32	680
299	300	32	720
300	301	100	680
301	302	56	720
302	303	56	710
303	304	45	710
304	305	68	700
305	306	28	680
306	307	57	700
307	308	44	680
308	309	58	650
309	310	46	690
310	311	142	710
311	312	47	660
312	313	64	670
313	314	125	710
314	315	55	690
315	316	32	700
316	317	51	720
317	318	94	730
318	319	53	720
319	320	57	720
320	321	53	710
321	322	56	710
322	323	88	690
323	324	62	710
324	325	69	710
325	326	91	760
326	327	93	700
327	328	106	760
328	329	68	760
329	330	56	740
330	331	57	710
331	332	56	730
332	333	70	700
333	334	70	730
334	335	40	710
335	336	46	700
336	337	45	710
337	338	52	620
338	339	80	660
339	340	69	710
340	341	56	730
341	342	82	680
342	343	58	740
343	344	68	710
344	345	39	710
345	346	92	710
346	347	34	750
347	348	42	710
348	349	69	710
349	350	33	740
350	351	268	730
351	352	70	690
352	353	54	770
353	354	44	740
354	355	42	760
355	356	44	730
356	357	57	720
357	358	81	740
358	359	103	740
359	360	69	720
360	361	34	670
361	362	33	730
362	363	69	690
363	364	57	680
364	365	66	680
365	366	34	710
366	367	69	730
367	368	45	680
368	369	45	690
369	370	42	710
370	371	47	710
371	372	38	710
372	373	82	750
373	374	89	760
374	375	45	720
375	376	34	750
376	377	53	740
377	378	69	680
378	379	48	710
379	380	90	660
380	381	22	720
381	382	43	720
382	383	41	720
383	384	82	690
384	385	56	700
385	386	80	770
386	387	37	720
387	388	33	740
388	389	81	750
389	390	131	730
390	391	43	680
391	392	69	680
392	393	72	600
393	394	34	710
394	395	58	750
395	396	69	720
396	397	81	700
397	398	116	720
398	399	77	700
399	400	45	680
400	401	57	700
401	402	56	730
402	403	57	710
403	404	109	620
404	405	44	750
405	406	37	720
406	407	45	740
407	408	46	700
408	409	68	720
409	410	78	720
410	411	63	730
411	412	45	740
412	413	67	690
413	414	33	760
414	415	69	700
415	416	45	720
416	417	178	710
417	418	82	770
418	419	55	720
419	420	32	710
420	421	45	720
421	422	57	750
422	423	69	770
423	424	32	690
424	425	93	710
425	426	131	690
426	427	49	710
427	428	39	690
428	429	37	680
429	430	111	710
430	431	66	750
431	432	45	730
432	433	44	730
433	434	35	720
434	435	67	710
435	436	33	710
436	437	57	710
437	438	58	720
438	439	49	760
439	440	29	700
440	441	31	720
441	442	71	720
442	443	34	690
443	444	46	700
444	445	46	700
445	446	122	720
446	447	34	710
447	448	29	650
448	449	70	680
449	450	43	700
450	451	116	710
451	452	69	690
452	453	43	720
453	454	44	750
454	455	57	690
455	456	70	730
456	457	55	660
457	458	44	760
458	459	35	720
459	460	58	740
460	461	40	760
461	462	33	660
462	463	79	700
463	464	46	720
464	465	32	770
465	466	81	740
466	467	29	710
467	468	87	680
468	469	69	710
469	470	24	700
470	471	68	710
471	472	49	690
472	473	58	730
473	474	69	690
474	475	38	720
475	476	45	680
476	477	43	680
477	478	57	720
478	479	69	620
479	480	34	650
480	481	33	730
481	482	38	730
482	483	73	730
483	484	34	750
484	485	29	740
485	486	57	770
486	487	40	760
487	488	93	700
488	489	29	740
489	490	98	760
490	491	33	690
491	492	45	610
492	493	36	660
493	494	46	730
494	495	40	670
495	496	54	640
496	497	45	670
497	498	54	710
498	499	57	660
499	500	52	700
500	501	141	740
501	502	81	710
502	503	44	690
503	504	45	750
504	505	57	680
505	506	54	690
506	507	59	690
507	508	62	710
508	509	33	730
509	510	58	740
510	511	46	650
511	512	28	680
512	513	68	700
513	514	143	730
514	515	39	650
515	516	44	730
516	517	91	680
517	518	84	710
518	519	69	730
519	520	57	710
520	521	33	730
521	522	33	710
522	523	92	710
523	524	44	710
524	525	45	710
525	526	25	680
526	527	33	710
527	528	45	710
528	529	86	690
529	530	46	720
530	531	105	700
531	532	33	700
532	533	41	740
533	534	45	740
534	535	44	720
535	536	34	710
536	537	37	660
537	538	124	700
538	539	32	760
539	540	58	750
540	541	43	680
541	542	44	760
542	543	93	740
543	544	34	770
544	545	75	750
545	546	92	700
546	547	42	680
547	548	43	720
548	549	70	730
549	550	60	760

550	551	36	680
551	552	36	760
552	553	68	680
553	554	35	680
554	555	44	710
555	556	70	670
556	557	34	650
557	558	54	720
558	559	70	720
559	560	34	730
560	561	36	710
561	562	69	740
562	563	45	730
563	564	132	720
564	565	81	710
565	566	78	710
566	567	34	730
567	568	43	760
568	569	58	720
569	570	82	710
570	571	34	690
571	572	34	690
572	573	62	720
573	574	50	720
574	575	45	750
575	576	70	720
576	577	59	710
577	578	33	710
578	579	99	650
579	580	57	730
580	581	30	730
581	582	46	680
582	583	48	680
583	584	35	760
584	585	46	690
585	586	57	720
586	587	43	700
587	588	58	690
588	589	58	710
589	590	34	710
590	591	44	740
591	592	45	710
592	593	46	680
593	594	56	720
594	595	33	770
595	596	92	730
596	597	31	700
597	598	33	700
598	599	69	730
599	600	53	670
600	601	37	660
601	602	119	690
602	603	30	690
603	604	57	720
604	605	33	670
605	606	55	670
606	607	32	680
607	608	43	740
608	609	78	680
609	610	70	680
610	611	53	710
611	612	69	700
612	613	56	740
613	614	45	730
614	615	9	720
615	616	38	670
616	617	82	720
617	618	68	730
618	619	44	700
619	620	74	730
620	621	33	700
621	622	72	680
622	623	57	730
623	624	44	690
624	625	29	730
625	626	44	730
626	627	79	680
627	628	30	700
628	629	34	700
629	630	46	740
630	631	45	720
631	632	81	710
632	633	45	730
633	634	83	680
634	635	44	720
635	636	28	710
636	637	33	770
637	638	58	680
638	639	61	690
639	640	72	700
640	641	58	700
641	642	45	750
642	643	66	740
643	644	44	690
644	645	45	730
645	646	81	770
646	647	33	720
647	648	45	740
648	649	31	710
649	650	82	710
650	651	30	760
651	652	34	720
652	653	81	740
653	654	47	600
654	655	93	730
655	656	22	780
656	657	40	710
657	658	56	710
658	659	57	670
659	660	24	720
660	661	39	630
661	662	40	690
662	663	46	700
663	664	57	700
664	665	44	730
665	666	50	710
666	667	34	700
667	668	92	710
668	669	43	730
669	670	106	740
670	671	69	690
671	672	43	660
672	673	69	720
673	674	57	690
674	675	43	740
675	676	101	710
676	677	33	710
677	678	33	750
678	679	130	640
679	680	58	710
680	681	33	710
681	682	56	750
682	683	30	650
683	684	44	680
684	685	58	740
685	686	57	750
686	687	44	710
687	688	81	710
688	689	94	740
689	690	58	740
690	691	56	710
691	692	57	710
692	693	45	690
693	694	79	720
694	695	33	730
695	696	57	700
696	697	58	710
697	698	43	750
698	699	42	710
699	700	68	740
700	701	34	780
701	702	22	690
702	703	27	710
703	704	41	710
704	705	42	700
705	706	79	720
706	707	57	680
707	708	85	760
708	709	33	740
709	710	59	750
710	711	57	730
711	712	40	720
712	713	81	730
713	714	58	750
714	715	82	720
715	716	52	720
716	717	56	680
717	718	34	710
718	719	71	720
719	720	41	690
720	721	53	720
721	722	32	680
722	723	45	690
723	724	69	720
724	725	44	630
725	726	45	690
726	727	118	660
727	728	45	710
728	729	46	710
729	730	69	730
730	731	81	710
731	732	44	690
732	733	34	710
733	734	52	710
734	735	55	710
735	736	69	650
736	737	83	760
737	738	39	740
738	739	69	720
739	740	31	700
740	741	33	690
741	742	56	710
742	743	32	760
743	744	94	740
744	745	105	710
745	746	95	710
746	747	43	720
747	748	89	710
748	749	68	730
749	750	46	750
750	751	69	740
751	752	93	710
752	753	60	680
753	754	69	740
754	755	68	740
755	756	46	730
756	757	23	770
757	758	50	720
758	759	33	680
759	760	39	680
760	761	34	740
761	762	69	680
762	763	34	710
763	764	31	710
764	765	29	710
765	766	46	750
766	767	44	620
767	768	38	680
768	769	88	620
769	770	132	670
770	771	28	610
771	772	10	610
772	773	52	620

In [33]:
```
type(mba)
mba.head(15)
```

Out[33]:

	datasrno	workex	gmat
0	1	21	720
1	2	107	640
2	3	57	740
3	4	99	690
4	5	208	710
5	6	136	660
6	7	70	660
7	8	103	710
8	9	79	700
9	10	22	730
10	11	69	700
11	12	41	740
12	13	72	650
13	14	69	720
14	15	20	700

In [34]:
```
mba.loc[1,["gmat"]]
```

Out[34]:
```
gmat    640
Name: 1, dtype: int64
```

In [38]:
```
mba.skew()
```

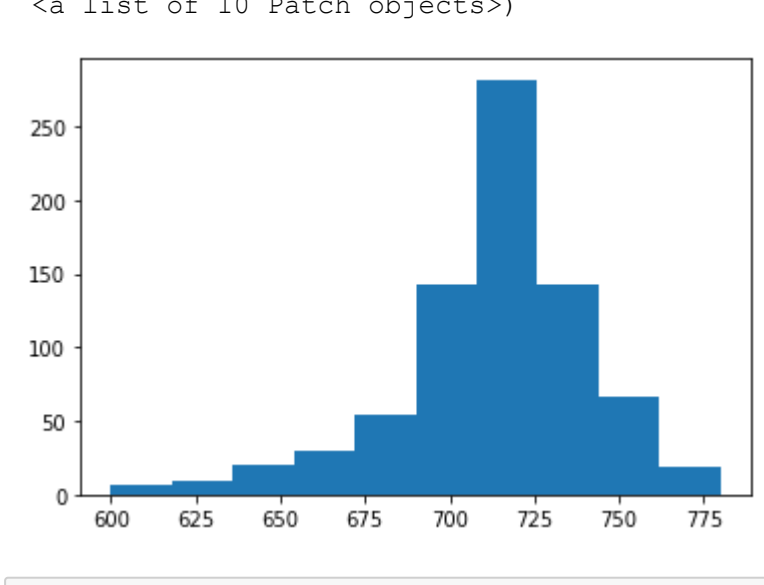
Out[38]:
```
datasrno    0.000000
workex      2.608537
gmat       -0.595477
dtype: float64
```

In [37]:
```
mba.kurt()
```

Out[37]:
```
datasrno    -1.200000
workex      13.404732
gmat         1.167164
dtype: float64
```

In [39]:
```
plt.hist(mba['gmat']) # left skew
```

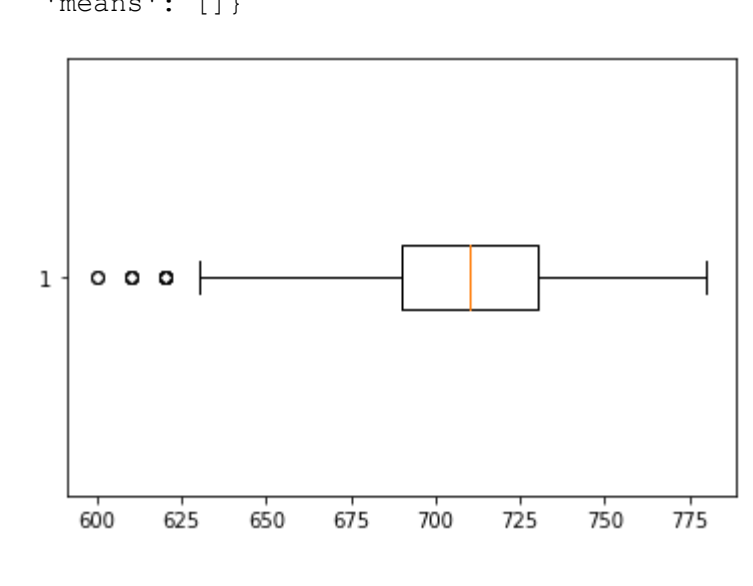
Out[39]:
```
(array([  6.,   9.,  20.,  30.,  54., 143., 282., 143.,  67.,  19.]),
 array([600., 618., 636., 654., 672., 690., 708., 726., 744., 762., 780.]),
 <a list of 10 Patch objects>)
```



In [14]:
```
import matplotlib.pyplot as plt
```

In [41]:
```
plt.boxplot(mba["gmat"],vert = False)
```

Out[41]:
```
{'whiskers': [<matplotlib.lines.Line2D at 0x2c7f1ca2488>,
  <matplotlib.lines.Line2D at 0x2c7f1c9ae08>],
 'caps': [<matplotlib.lines.Line2D at 0x2c7f1ca2f88>,
  <matplotlib.lines.Line2D at 0x2c7f1ca2b88>],
 'boxes': [<matplotlib.lines.Line2D at 0x2c7f1c9abc8>],
 'medians': [<matplotlib.lines.Line2D at 0x2c7f1ca9a88>],
 'fliers': [<matplotlib.lines.Line2D at 0x2c7f1ca9fc8>],
 'means': []}
```



In [42]: `mba.describe`

```
Out[42]: <bound method NDFrame.describe of      datasrno  workex  gmat
0           1      21   720
1           2     107   640
2           3      57   740
3           4      99   690
4           5     208   710
5           6     136   660
6           7      70   660
7           8     103   710
8           9      79   700
9          10      22   730
10         11      69   700
11         12      41   740
12         13      72   650
13         14      69   720
14         15      20   700
15         16      21   760
16         17      19   710
17         18      86   720
18         19     231   690
19         20      20   770
20         21     175   660
21         22      21   710
22         23      44   720
23         24      23   650
24         25      20   710
25         26      70   720
26         27      46   710
27         28      33   650
28         29     130   690
29         30      57   690
30         31      57   750
31         32      45   710
32         33      55   730
33         34      42   770
34         35      34   690
35         36      55   710
36         37      44   710
37         38      79   710
38         39      45   740
39         40      38   720
40         41      44   710
41         42      83   720
42         43     118   650
43         44      45   710
44         45      89   690
45         46      77   700
46         47      91   730
47         48      61   690
48         49      47   670
49         50      69   710
50         51      59   720
51         52      32   710
52         53      74   740
53         54     279   750
54         55      33   710
55         56      33   730
56         57      34   730
57         58     110   710
58         59      44   710
59         60      44   690
60         61      46   720
61         62      58   690
62         63      45   710
63         64      34   720
64         65      54   770
65         66      45   720
66         67      33   740
67         68      82   710
68         69      72   740
69         70      77   710
70         71      43   740
71         72      54   740
72         73      92   730
73         74      90   720
74         75      66   760
75         76      38   720
76         77      25   740
77         78      57   740
78         79      31   710
79         80      58   690
80         81      55   710
81         82      68   710
82         83      79   730
83         84      71   700
84         85      68   710
85         86      32   750
86         87      32   710
87         88      45   710
88         89      69   720
89         90      65   680
90         91      57   710
91         92      45   710
92         93      92   710
93         94      57   740
94         95      69   710
95         96      32   710
96         97      70   700
97         98      59   690
98         99      44   770
99        100      44   770
100       101      46   720
101       102      33   730
102       103      46   710
103       104      82   720
104       105      53   690
105       106      33   740
106       107      34   690
107       108      37   690
108       109      55   750
109       110      52   720
110       111      68   670
111       112      51   690
112       113      69   710
113       114      47   690
114       115      56   750
115       116      45   710
116       117      56   680
117       118      48   690
118       119      34   730
119       120      55   750
120       121      43   700
121       122      69   720
122       123      31   680
123       124      46   690
124       125      58   700
125       126      47   740
126       127      56   710
127       128      43   730
128       129      58   720
129       130      27   720
130       131      46   740
131       132      58   680
132       133      34   670
133       134      34   730
134       135      45   680
135       136      68   710
136       137      34   740
137       138      46   760
138       139      45   710
139       140      56   710
140       141      33   710
141       142      43   730
142       143      44   680
143       144      33   690
144       145      69   720
145       146      82   730
146       147      64   750
147       148     126   770
148       149      80   750
149       150      80   720
150       151      45   710
151       152      45   700
152       153      68   720
153       154      58   720
154       155      45   690
155       156     130   710
156       157      80   730
157       158     130   710
158       159      34   740
159       160      80   690
160       161      48   630
161       162      45   730
162       163      40   720
163       164      58   710
164       165      35   690
165       166      40   690
166       167      79   730
167       168      34   710
168       169      56   720
169       170      68   710
170       171      32   740
171       172      57   710
172       173      53   650
173       174      57   760
174       175      45   680
175       176      46   700
176       177      77   710
177       178      44   690
178       179      68   720
179       180      45   740
180       181      54   710
181       182      58   710
182       183      59   730
183       184      38   660
184       185      94   710
185       186      46   710
186       187      96   710
187       188      44   740
188       189      50   690
189       190      91   610
190       191     117   700
191       192      58   690
192       193      32   760
193       194      57   730
194       195      57   700
195       196      57   720
196       197      32   710
197       198      33   750
198       199      41   690
199       200      70   750
200       201      45   660
201       202      68   740
202       203      90   710
203       204      82   720
204       205      33   750
205       206      46   710
206       207      45   710
207       208      45   710
208       209      79   680
209       210     109   720
210       211      53   710
211       212      44   700
212       213      33   740
213       214      70   690
214       215      44   710
215       216      51   760
216       217      85   720
217       218      57   710
218       219      66   710
219       220      44   700
220       221      50   690
221       222      30   750
222       223      33   690
223       224      89   710
224       225      55   710
225       226     128   710
226       227      45   710
227       228      33   710
228       229      35   720
229       230      33   710
230       231      58   660
231       232      49   650
232       233      57   710
233       234      45   700
234       235      63   730
235       236      81   700
236       237      56   710
237       238      45   690
238       239      86   760
239       240      45   740
240       241      69   750
241       242      43   710
242       243      45   730
243       244      70   710
244       245      33   740
245       246      43   710
246       247      34   720
247       248      47   690
248       249      57   690
249       250      70   700
250       251      93   700
251       252      92   710
252       253      32   710
253       254      80   720
254       255      33   760
255       256      32   720
256       257      55   690
257       258      46   700
258       259      66   710
259       260      65   710
260       261      62   720
261       262      71   720
262       263      41   760
263       264      30   730
264       265      45   730
265       266      91   720
266       267      46   740
267       268      44   740
268       269      74   710
269       270      45   710
270       271     112   720
271       272      46   700
272       273      69   710
273       274      32   770
274       275      69   760
275       276      44   740
276       277      69   700
277       278      45   650
278       279      81   720
279       280      82   710
280       281      44   690
281       282      34   700
282       283      46   730
283       284      34   720
284       285      43   720
285       286      69   710
286       287      34   720
287       288      32   760
288       289      45   740
289       290      50   710
290       291      57   720
291       292      50   680
292       293      58   720
293       294      92   690
294       295     131   710
295       296      45   650
296       297      64   700
297       298      48   700
298       299      32   680
299       300      32   720
300       301     100   680
301       302      56   720
302       303      56   710
303       304      45   710
304       305      68   700
305       306      28   680
306       307      57   700
307       308      44   680
308       309      58   650
309       310      46   690
310       311     142   710
311       312      47   660
312       313      64   670
313       314     125   710
314       315      55   690
315       316      32   700
316       317      51   720
317       318      94   730
318       319      53   720
319       320      57   720
320       321      53   710
321       322      56   710
322       323      88   690
323       324      42   710
324       325      69   710
325       326      91   760
326       327      93   700
327       328     106   760
328       329      68   760
329       330      56   740
330       331      57   710
331       332      56   730
332       333      70   700
333       334      70   730
334       335      40   710
335       336      46   700
336       337      45   710
337       338      52   620
338       339      80   660
339       340      69   710
340       341      56   730
341       342      82   680
342       343      58   760
343       344      68   710
344       345      39   710
345       346      92   710
346       347      34   750
347       348      42   710
348       349      69   710
349       350      33   760
350       351     268   730
351       352      70   690
352       353      54   770
353       354      44   760
354       355      42   760
355       356      44   730
356       357      57   720
357       358      81   740
358       359     103   760
359       360      69   720
360       361      34   670
361       362      33   730
362       363      69   690
363       364      57   680
364       365      66   680
365       366      34   710
366       367      69   730
367       368      45   680
368       369      45   690
369       370      42   710
370       371      47   710
371       372      38   710
372       373      82   750
373       374      89   760
374       375      45   720
375       376      34   750
376       377      53   740
377       378      69   680
378       379      48   710
379       380      90   660
380       381      22   720
381       382      43   720
382       383      41   720
383       384      82   690
384       385      56   700
385       386      80   730
386       387      37   720
387       388      33   760
388       389      81   750
389       390     131   730
390       391      43   680
391       392      69   680
392       393      72   600
393       394      34   710
394       395      58   750
395       396      69   720
396       397      81   700
397       398     116   720
398       399      77   700
399       400      45   680
400       401      57   700
401       402      56   730
402       403      57   710
403       404     109   620
404       405      44   750
405       406      37   720
406       407      45   740
407       408      46   700
408       409      68   720
409       410      78   720
410       411      63   730
411       412      45   740
412       413      67   690
413       414      33   710
414       415      69   730
415       416      45   720
416       417     176   710
417       418      82   770
418       419      55   720
419       420      32   710
420       421      45   720
421       422      57   720
422       423      69   770
423       424      32   690
424       425      93   690
425       426     131   690
426       427      49   710
427       428      39   690
428       429      37   680
429       430     111   710
430       431      86   750
431       432      45   730
432       433      44   730
433       434      35   720
434       435      67   710
435       436      33   710
436       437      57   730
437       438      52   730
438       439      69   760
439       440      29   740
440       441      31   720
441       442      71   720
442       443      34   690
443       444      46   700
444       445      46   700
445       446     122   720
446       447      34   710
447       448      29   650
448       449      70   680
449       450      43   700
450       451     116   710
451       452      69   690
452       453      43   720
453       454      44   750
454       455      57   690
455       456      70   730
456       457      55   660
457       458      44   760
458       459      35   720
459       460      58   740
460       461      46   760
461       462      33   660
462       463      79   700
463       464      46   720
464       465      32   770
465       466      81   740
466       467      29   710
467       468      87   680
468       469      69   710
469       470      24   700
470       471      68   710
471       472      49   690
472       473      58   730
473       474      69   690
474       475      38   720
475       476      45   680
476       477      43   680
477       478      57   720
478       479      69   620
479       480      34   650
480       481      33   730
481       482      38   690
482       483      73   730
483       484      34   750
484       485      29   760
485       486      57   770
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487       488      93   700
488       489      29   760
489       490      98   760
490       491      33   690
491       492      45   610
492       493      36   660
493       494      66   690
494       495      40   670
495       496      54   640
496       497      69   700
497       498      54   710
498       499      57   660
499       500      52   700
500       501     141   760
501       502      81   710
502       503      44   690
503       504      45   750
504       505      57   680
505       506      54   690
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507       508      62   710
508       509      33   730
509       510      58   760
510       511      46   650
511       512      28   680
512       513      68   690
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530       531     105   700
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534       535      44   720
535       536      34   710
536       537      37   660
537       538     124   700
538       539      32   760
539       540      58   750
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544       545      75   750
545       546      92   700
546       547      62   680
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549       550      60   760
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551       552      36   760
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554       555      44   710
555       556      70   670
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565       566      78   710
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586       587      43   700
587       588      58   690
588       589      58   710
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591       592      45   710
592       593      46   680
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594       595      33   770
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628       629      34   700
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635       636      28   710
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644       645      45   730
645       646      81   770
646       647      33   720
647       648      45   740
648       649      31   710
649       650      82   710
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651       652      34   720
652       653      81   740
653       654      47   600
654       655      93   730
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656       657      40   710
657       658      58   710
658       659      57   670
659       660      24   720
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661       662      40   690
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663       664      57   700
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665       666      50   710
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711       712      40   720
712       713      81   730
713       714      58   750
714       715      82   720
715       716      52   720
716       717      56   680
717       718      34   710
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725       726      45   690
726       727     118   660
727       728      45   710
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730       731      81   710
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732       733      34   710
733       734      52   710
734       735      55   710
735       736      69   650
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737       738      39   740
738       739      69   720
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740       741      33   690
741       742      56   710
742       743      32   760
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744       745     105   710
745       746      95   710
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749       750      46   750
750       751      69   740
751       752      93   710
752       753      60   680
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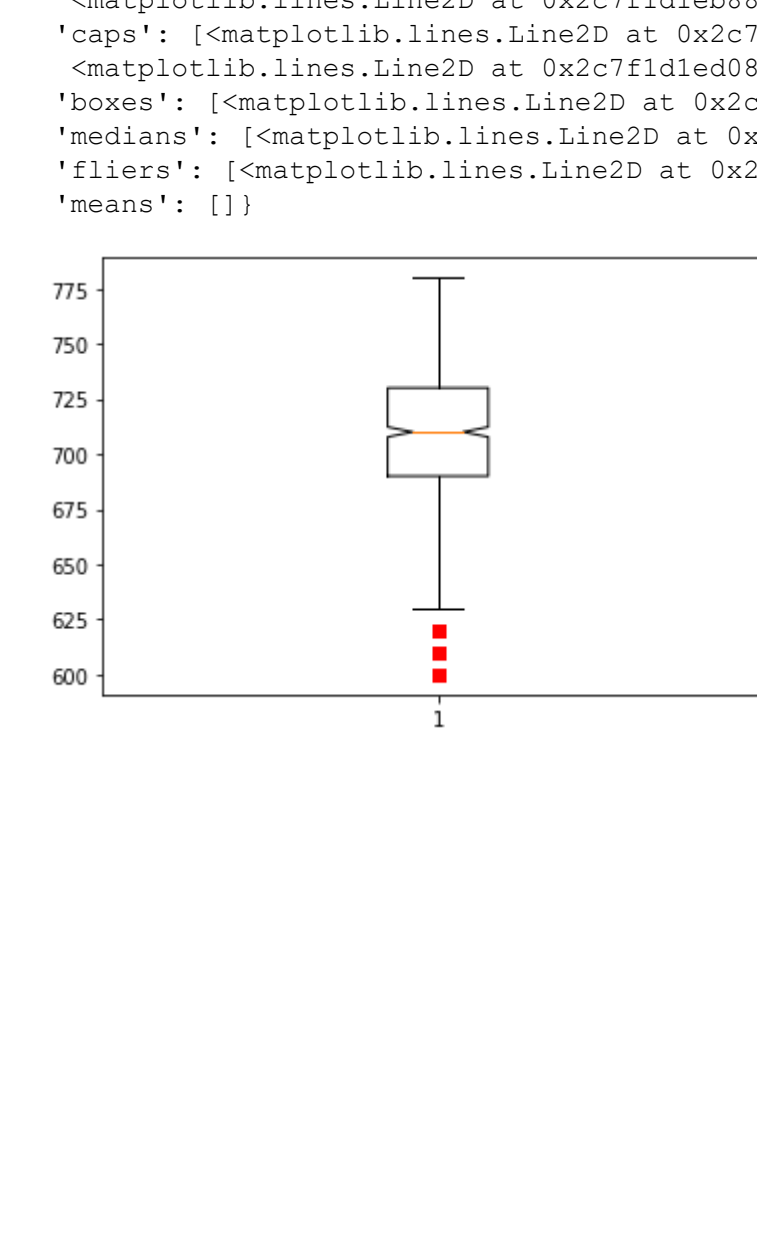
757       758      50   720
758       759      33   680
759       760      39   680
760       761      34   740
761       762      69   680
762       763      34   710
763       764      31   710
764       765      29   710
765       766      46   750
766       767      44   620
767       768      38   680
768       769      88   620
769       770     132   670
770       771      28   610
771       772      10   610
772       773      52   620>
```

In [43]: `plt.boxplot(mba['gmat'],1,'rs',1)# For Horizontal`

```
Out[43]: {'whiskers': [<matplotlib.lines.Line2D at 0x2c7f1d06488>,
  <matplotlib.lines.Line2D at 0x2c7f1d1eb88>],
 'caps': [<matplotlib.lines.Line2D at 0x2c7f1d1efc8>,
  <matplotlib.lines.Line2D at 0x2c7f1d1ed08>],
 'boxes': [<matplotlib.lines.Line2D at 0x2c7f1d17ec8>],
 'medians': [<matplotlib.lines.Line2D at 0x2c7f1d23c08>],
 'fliers': [<matplotlib.lines.Line2D at 0x2c7f1d23d08>],
 'means': []}
```



In [15]:
```
help(plt.boxplot)
```

```
Help on function boxplot in module matplotlib.pyplot:

boxplot(x, notch=None, sym=None, vert=None, whis=None, positions=None, widths=None, patch_artist=Non
e, bootstrap=None, usermedians=None, conf_intervals=None, meanline=None, showmeans=None, showcaps=Non
e, showbox=None, showfliers=None, boxprops=None, labels=None, flierprops=None, medianprops=None, mean
props=None, capprops=None, whiskerprops=None, manage_ticks=True, autorange=False, zorder=None, *, dat
a=None)
    Make a box and whisker plot.

    Make a box and whisker plot for each column of ``x`` or each
    vector in sequence ``x``.  The box extends from the lower to
    upper quartile values of the data, with a line at the median.
    The whiskers extend from the box to show the range of the
    data.  Flier points are those past the end of the whiskers.

    Parameters
    ----------
    x : Array or a sequence of vectors.
        The input data.

    notch : bool, optional (False)
        If `True`, will produce a notched box plot. Otherwise, a
        rectangular boxplot is produced. The notches represent the
        confidence interval (CI) around the median. See the entry
        for the ``bootstrap`` parameter for information regarding
        how the locations of the notches are computed.

        .. note::

            In cases where the values of the CI are less than the
            lower quartile or greater than the upper quartile, the
            notches will extend beyond the box, giving it a
            distinctive "flipped" appearance. This is expected
            behavior and consistent with other statistical
            visualization packages.

    sym : str, optional
        The default symbol for flier points. Enter an empty string
        ('') if you don't want to show fliers. If `None`, then the
        fliers default to 'b+'  If you want more control use the
        flierprops kwarg.

    vert : bool, optional (True)
        If `True` (default), makes the boxes vertical. If `False`,
        everything is drawn horizontally.

    whis : float, sequence, or string (default = 1.5)
        As a float, determines the reach of the whiskers to the beyond the
        first and third quartiles. In other words, where IQR is the
        interquartile range (`Q3-Q1`), the upper whisker will extend to
        last datum less than `Q3 + whis*IQR`). Similarly, the lower whisker
        will extend to the first datum greater than `Q1 - whis*IQR`.
        Beyond the whiskers, data
        are considered outliers and are plotted as individual
        points. Set this to an unreasonably high value to force the
        whiskers to show the min and max values. Alternatively, set
        this to an ascending sequence of percentile (e.g., [5, 95])
        to set the whiskers at specific percentiles of the data.
        Finally, ``whis`` can be the string ``'range'`` to force the
        whiskers to the min and max of the data.

    bootstrap : int, optional
        Specifies whether to bootstrap the confidence intervals
        around the median for notched boxplots. If ``bootstrap`` is
        None, no bootstrapping is performed, and notches are
        calculated using a Gaussian-based asymptotic approximation
        (see McGill, R., Tukey, J.W., and Larsen, W.A., 1978, and
        Kendall and Stuart, 1967). Otherwise, bootstrap specifies
        the number of times to bootstrap the median to determine its
        95% confidence intervals. Values between 1000 and 10000 are
        recommended.

    usermedians : array-like, optional
        An array or sequence whose first dimension (or length) is
        compatible with ``x``. This overrides the medians computed
        by matplotlib for each element of ``usermedians`` that is not
        `None`. When an element of ``usermedians`` is None, the median
        will be computed by matplotlib as normal.

    conf_intervals : array-like, optional
        Array or sequence whose first dimension (or length) is
        compatible with ``x`` and whose second dimension is 2. When
        the an element of ``conf_intervals`` is not None, the
        notch locations computed by matplotlib are overridden
        (provided ``notch`` is `True`). When an element of
        ``conf_intervals`` is `None`, the notches are computed by the
        method specified by the other kwargs (e.g., ``bootstrap``).

    positions : array-like, optional
        Sets the positions of the boxes. The ticks and limits are
        automatically set to match the positions. Defaults to
        `range(1, N+1)` where N is the number of boxes to be drawn.

    widths : scalar or array-like
        Sets the width of each box either with a scalar or a
        sequence. The default is 0.5, or ``0.15*(distance between
        extreme positions)``, if that is smaller.

    patch_artist : bool, optional (False)
        If `False` produces boxes with the Line2D artist. Otherwise,
        boxes and drawn with Patch artists.

    labels : sequence, optional
        Labels for each dataset. Length must be compatible with
        dimensions of ``x``.

    manage_ticks : bool, optional (True)
        If True, the tick locations and labels will be adjusted to match
        the boxplot positions.

    autorange : bool, optional (False)
        When `True` and the data are distributed such that the 25th and
        75th percentiles are equal, ``whis`` is set to ``'range'`` such
        that the whisker ends are at the minimum and maximum of the data.

    meanline : bool, optional (False)
        If `True` (and ``showmeans`` is `True`), will try to render
        the mean as a line spanning the full width of the box
        according to ``meanprops`` (see below). Not recommended if
        ``shownotches`` is also True. Otherwise, means will be shown
        as points.

    zorder : scalar, optional (None)
        Sets the zorder of the boxplot.

    Other Parameters
    ----------------
    showcaps : bool, optional (True)
        Show the caps on the ends of whiskers.
    showbox : bool, optional (True)
        Show the central box.
    showfliers : bool, optional (True)
        Show the outliers beyond the caps.
    showmeans : bool, optional (False)
        Show the arithmetic means.
    capprops : dict, optional (None)
        Specifies the style of the caps.
    boxprops : dict, optional (None)
        Specifies the style of the box.
    whiskerprops : dict, optional (None)
        Specifies the style of the whiskers.
    flierprops : dict, optional (None)
        Specifies the style of the fliers.
    medianprops : dict, optional (None)
        Specifies the style of the median.
    meanprops : dict, optional (None)
        Specifies the style of the mean.

    Returns
    -------
    result : dict
      A dictionary mapping each component of the boxplot to a list
      of the :class:`matplotlib.lines.Line2D` instances
      created. That dictionary has the following keys (assuming
      vertical boxplots):

      - ``boxes``: the main body of the boxplot showing the
        quartiles and the median's confidence intervals if
        enabled.

      - ``medians``: horizontal lines at the median of each box.

      - ``whiskers``: the vertical lines extending to the most
        extreme, non-outlier data points.

      - ``caps``: the horizontal lines at the ends of the
        whiskers.

      - ``fliers``: points representing data that extend beyond
        the whiskers (fliers).

      - ``means``: points or lines representing the means.

    Notes
    -----

    .. note::
        In addition to the above described arguments, this function can take a
        **data** keyword argument. If such a **data** argument is given, the
        following arguments are replaced by **data[<arg>]**:

        * All positional and all keyword arguments.

        Objects passed as **data** must support item access (``data[<arg>]``) and
        membership test (``<arg> in data``).
```

In [45]: plt.boxplot(mba)


```
Out[45]: {'whiskers': [<matplotlib.lines.Line2D at 0x2c7f1d7dec8>,
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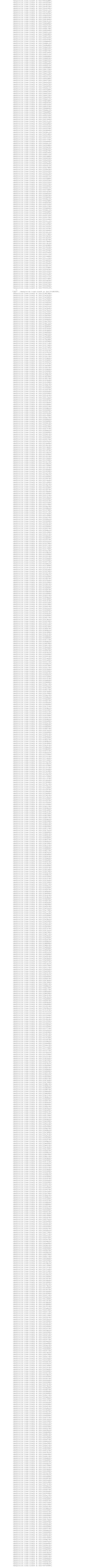

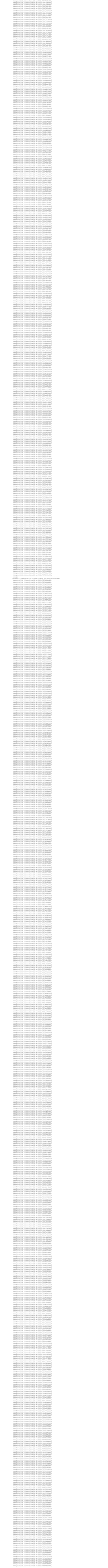

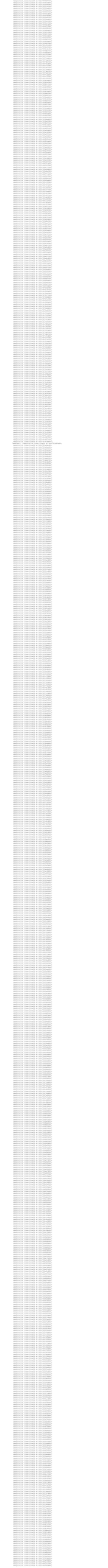

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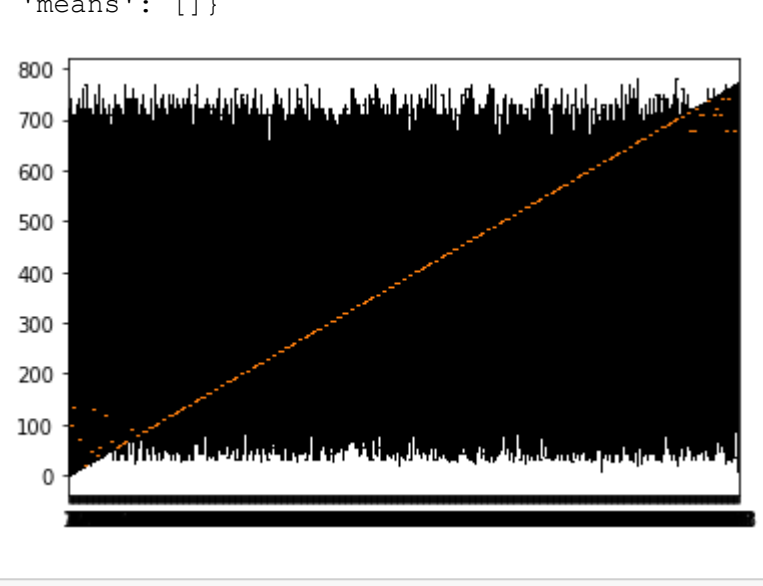
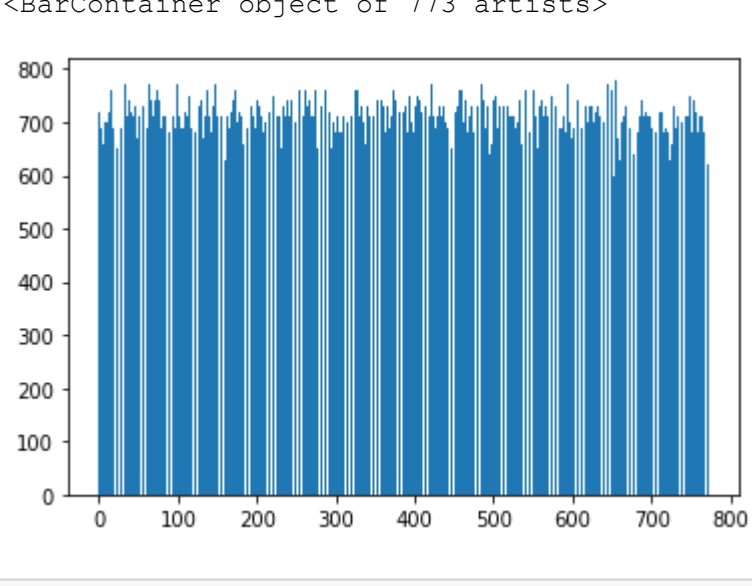


In [46]:
```
mba.shape # dimensions of data frame
```
Out[46]:
```
(773, 3)
```

In [16]:
```
plt.bar(height = mba["gmat"], x = np.arange(773)) # initializing the parameter
```
Out[16]:
```
<BarContainer object of 773 artists>
```



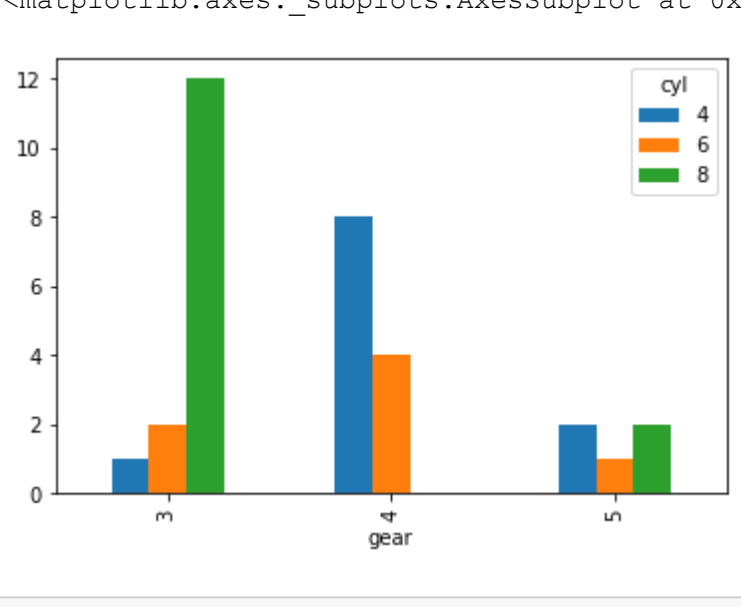
In [10]:
```
mtcars.describe
```
Out[10]:
```
<bound method NDFrame.describe of      mpg  cyl   disp   hp  drat     wt   qsec  vs  am  gear  carb
0   21.0    6  160.0  110  3.90  2.620  16.46   0   1     4     4
1   21.0    6  160.0  110  3.90  2.875  17.02   0   1     4     4
2   22.8    4  108.0   93  3.85  2.320  18.61   1   1     4     1
3   21.4    6  258.0  110  3.08  3.215  19.44   1   0     3     1
4   18.7    8  360.0  175  3.15  3.440  17.02   0   0     3     2
5   18.1    6  225.0  105  2.76  3.460  20.22   1   0     3     1
6   14.3    8  360.0  245  3.21  3.570  15.84   0   0     3     4
7   24.4    4  146.7   62  3.69  3.190  20.00   1   0     4     2
8   22.8    4  140.8   95  3.92  3.150  22.90   1   0     4     2
9   19.2    6  167.6  123  3.92  3.440  18.30   1   0     4     4
10  17.8    6  167.6  123  3.92  3.440  18.90   1   0     4     4
11  16.4    8  275.8  180  3.07  4.070  17.40   0   0     3     3
12  17.3    8  275.8  180  3.07  3.730  17.60   0   0     3     3
13  15.2    8  275.8  180  3.07  3.780  18.00   0   0     3     3
14  10.4    8  472.0  205  2.93  5.250  17.98   0   0     3     4
15  10.4    8  460.0  215  3.00  5.424  17.82   0   0     3     4
16  14.7    8  440.0  230  3.23  5.345  17.42   0   0     3     4
17  32.4    4   78.7   66  4.08  2.200  19.47   1   1     4     1
18  30.4    4   75.7   52  4.93  1.615  18.52   1   1     4     2
19  33.9    4   71.1   65  4.22  1.835  19.90   1   1     4     1
20  21.5    4  120.1   97  3.70  2.465  20.01   1   0     3     1
21  15.5    8  318.0  150  2.76  3.520  16.87   0   0     3     2
22  15.2    8  304.0  150  3.15  3.435  17.30   0   0     3     2
23  13.3    8  350.0  245  3.73  3.840  15.41   0   0     3     4
24  19.2    8  400.0  175  3.08  3.845  17.05   0   0     3     2
25  27.3    4   79.0   66  4.08  1.935  18.90   1   1     4     1
26  26.0    4  120.3   91  4.43  2.140  16.70   0   1     5     2
27  30.4    4   95.1  113  3.77  1.513  16.90   1   1     5     2
28  15.8    8  351.0  264  4.22  3.170  14.50   0   1     5     4
29  19.7    6  145.0  175  3.62  2.770  15.50   0   1     5     6
30  15.0    8  301.0  335  3.54  3.570  14.60   0   1     5     8
31  21.4    4  121.0  109  4.11  2.780  18.60   1   1     4     2>
```

In [18]:
```
mtcars = pd.read_csv("mtcars.csv")
```

In [19]:
```
pd.crosstab(mtcars.gear,mtcars.cyl)
```
Out[19]:

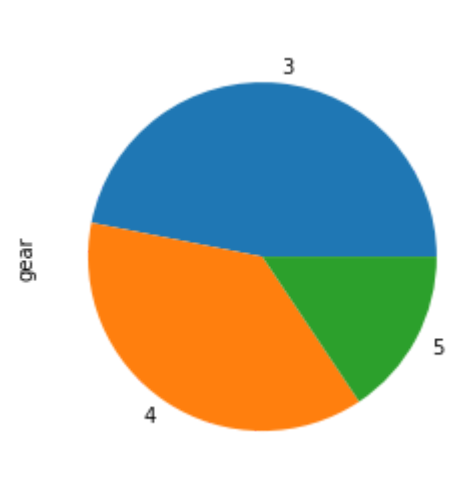
gear \ cyl	4	6	8
3	1	2	12
4	8	4	0
5	2	1	2

In [20]:
```
pd.crosstab(mtcars.gear,mtcars.cyl).plot(kind="bar")
```
Out[20]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x18c5af73588>
```



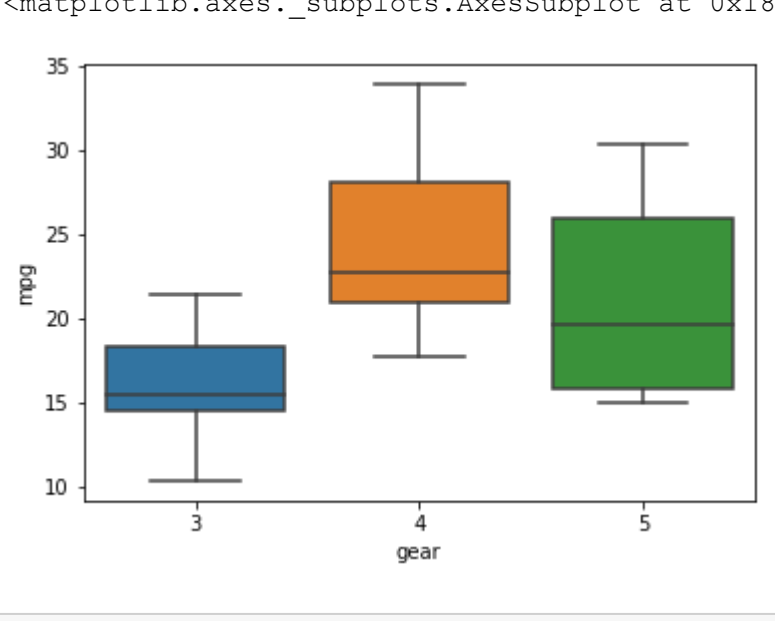
In [21]:
```
mtcars["gear"].value_counts()
```
Out[21]:
```
3    15
4    12
5     5
Name: gear, dtype: int64
```

In [22]:
```
mtcars.gear.value_counts().plot(kind="pie")
```
Out[22]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x18c5b21d5c8>
```

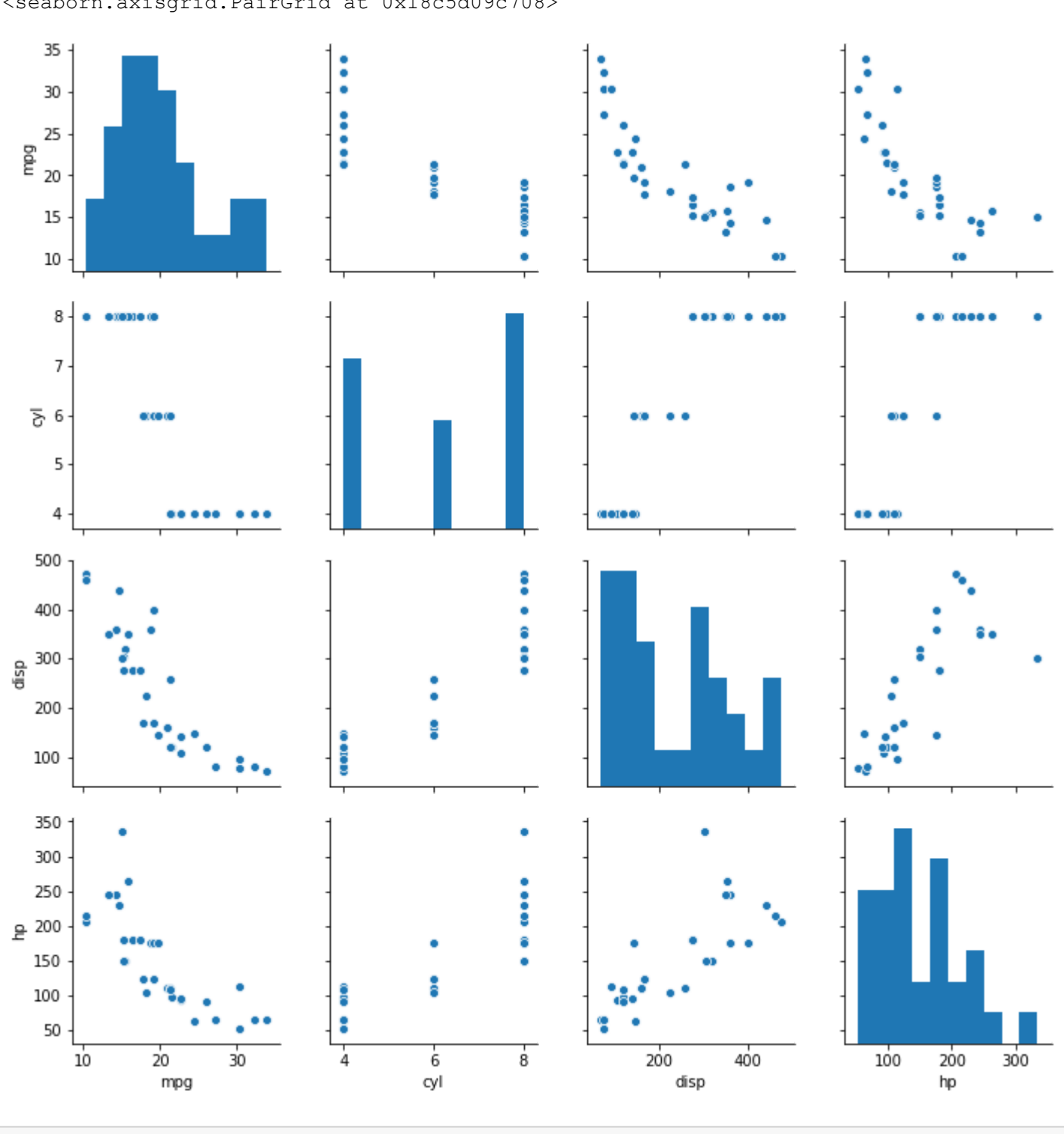


In [24]:
```
import seaborn as sns
```

In [25]:
```
sns.boxplot(x="gear",y="mpg",data=mtcars)
```
Out[25]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x18c5b211ac8>
```



In [26]:
```
sns.pairplot(mtcars.iloc[:,0:4]) # histogram of each column and
```
Out[26]:
```
<seaborn.axisgrid.PairGrid at 0x18c5d09c708>
```



In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]: