In [1]:

```
import pandas as pd
df = pd.read_csv(
    "https://vincentarelbundock.github.io/Rdatasets/csv/boot/amis.csv",
    usecols=range(1,5)
                 )
```

In [2]:

```
before = []
after = []

for row in df.values:
    if row[3] == 7:
        if row[2] == 1:
            if row[1] == 1:
                before.append(row[0])
            if row[1] == 3:
                after.append(row[0])

print("average before sign: ",
      sum(before)/len(before))
print("average after sign: ",
      sum(after)/len(after))
```

```
average before sign:  29.86
average after sign:  29.81
```

In [3]:

```
# Looks like the sign made no difference
```

In [4]:

```
# rather than repeat this process in one line with pandas!
df.groupby(['pair','warning','period']).agg(['mean','std']).round(2)
```

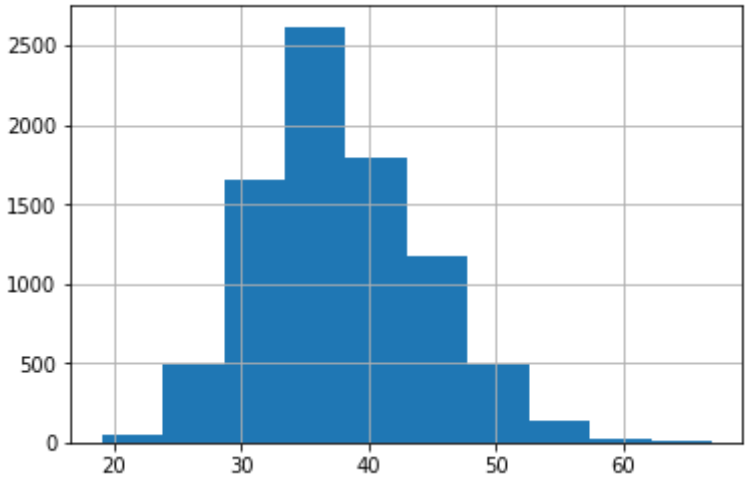
Out[4]:

			speed	
			mean	std
pair	warning	period		
1	1	1	34.53	5.01
		2	35.97	5.13
		3	34.77	5.08
	2	1	34.17	5.30
		2	38.65	5.49
		3	36.26	5.58
2	1	1	38.95	5.63
		2	38.28	4.15
		3	39.58	4.67
	2	1	30.25	3.92
		2	35.00	5.91
		3	35.82	5.03
3	1	1	32.22	4.51
		2	33.59	4.43
		3	31.77	4.56
	2	1	37.95	5.82
		2	36.49	6.49
		3	38.56	5.09
4	1	1	36.38	5.68
		2	35.95	5.36
		3	35.46	4.32
	2	1	37.95	5.82
		2	36.49	6.49
		3	36.00	5.28
5	1	1	36.61	4.97
		2	34.04	5.49
		3	39.72	7.54
	2	1	38.75	4.64
		2	38.79	4.87

			speed	
			mean	std
pair	warning	period		
		3	40.51	4.64
...	...	...	...	...
10	1	1	33.95	4.96
		2	35.09	5.97
		3	35.85	4.93
	2	1	34.02	5.48
		2	35.07	5.35
		3	38.69	6.66
11	1	1	34.62	4.86
		2	33.63	3.86
		3	36.12	5.37
	2	1	32.19	3.84
		2	35.12	4.29
		3	35.10	4.53
12	1	1	38.57	6.57
		2	35.30	5.32
		3	40.65	5.98
	2	1	40.86	5.32
		2	43.52	5.20
		3	43.08	5.35
13	1	1	39.62	6.05
		2	42.61	5.12
		3	41.08	3.95
	2	1	44.59	6.67
		2	49.46	7.91
		3	45.03	5.09
14	1	1	39.30	5.29
		2	42.24	4.72
		3	40.68	4.80
	2	1	44.59	4.97
		2	44.18	4.69
		3	47.21	5.95

84 rows × 2 columns

In [6]:
```
# pandas has lots of other cool features too!
_ = df['speed'].hist()
```



In [ ]:
```

```