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

(1)

In [2]:
```
csv_in = 'cs3-mid-1.csv'
df = pd.read_csv(csv_in, skiprows=1, sep=',', header=0)
```

(2)(3)(4)

In [3]:
```
print(df.shape)
print(df.info())
display(df.head())
```

```
(40, 6)
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 40 entries, 0 to 39
Data columns (total 6 columns):
 #   Column  Non-Null Count  Dtype  
---  ------  --------------  -----  
 0   n1      40 non-null     float64
 1   n2      40 non-null     float64
 2   n3      40 non-null     float64
 3   n4      40 non-null     float64
 4   n5      40 non-null     float64
 5   c       40 non-null     object 
dtypes: float64(5), object(1)
memory usage: 2.0+ KB
None
```

	n1	n2	n3	n4	n5	c
0	2.43	-2.89	-1.61	1.69	1.86	B
1	1.19	-1.02	1.50	0.83	-1.04	C
2	-1.48	0.51	-0.15	-1.19	0.94	A
3	0.78	-2.56	0.65	0.28	1.53	B
4	-1.86	1.21	0.37	-1.42	0.21	A

(5) 40

(6) 6

(7) (8)

In [4]:
```
ser_n1 = df['n1']
print(ser_n1.min())
```

```
-2.13
```

(9)

-2.13

(10)

In [5]:
```
display(df.sort_values(by='n1').head())
```

	n1	n2	n3	n4	n5	c
9	-2.13	1.45	-0.35	-1.60	0.68	A
22	-2.07	3.64	-0.47	-1.23	-1.59	B
31	-2.04	5.69	-1.98	-0.87	-2.75	B
4	-1.86	1.21	0.37	-1.42	0.21	A
2	-1.48	0.51	-0.15	-1.19	0.94	A

(11)

-2.04

(12)

In [6]:
```
print( df['c'].value_counts() )
```

```
c
A    14
B    13
C    13
Name: count, dtype: int64
```

(13)

14

(14) (15)

In [7]:
```
df2=df.drop(columns='n5')
```

In [8]:
```
display(df2.groupby('c').mean())
```

c	n1	n2	n3	n4
A	-0.512857	-0.008571	-1.038571	-0.417857
B	0.220769	0.244615	-0.241538	0.227692
C	0.950769	-0.391538	0.270000	0.749231

(16)

0.95

(17)(18)

In [9]:
```
df['n_tot']=df['n2']+df['n4']
df3=df.sort_values(by='n_tot', ascending=False)
display(df3.head())
```

	n1	n2	n3	n4	n5	c	n_tot
31	-2.04	5.69	-1.98	-0.87	-2.75	B	4.82
7	0.64	3.06	-1.32	1.02	-2.92	B	4.08
5	-0.93	3.19	-0.93	-0.31	-1.86	B	2.88
38	0.49	1.92	-1.42	0.73	-1.50	B	2.65
30	2.83	0.12	-1.67	2.47	-1.63	C	2.59

(19)

4.82

(20)

In [10]:
```
plt.hist(df3['n_tot'], bins=8)
plt.plot()
```

Out[10]:
```
[]
```