CS3-mid-p3

In [6]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

In [7]:
```
csv_in = 'mid-p3.csv'
ts = pd.read_csv(csv_in, sep=',', skiprows=0, header=0)
print(ts.shape)
print(ts.info())
display(ts.head())
```

```
(100, 3)
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 100 entries, 0 to 99
Data columns (total 3 columns):
 #   Column  Non-Null Count  Dtype
---  ------  --------------  -----
 0   Date    100 non-null    object
 1   X0      100 non-null    float64
 2   X1      100 non-null    float64
dtypes: float64(2), object(1)
memory usage: 2.5+ KB
None
```

	Date	X0	X1
0	2022-04-01	15.31	-1.94
1	2022-04-03	12.97	-2.06
2	2022-04-04	15.94	5.96
3	2022-04-05	25.87	-16.75
4	2022-04-06	16.51	-31.70

In [8]:
```
ts['Date'] = pd.to_datetime(ts['Date'])  # (1)
print(ts.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 100 entries, 0 to 99
Data columns (total 3 columns):
 #   Column  Non-Null Count  Dtype
---  ------  --------------  -----
 0   Date    100 non-null    datetime64[ns]
 1   X0      100 non-null    float64
 2   X1      100 non-null    float64
dtypes: datetime64[ns](1), float64(2)
memory usage: 2.5 KB
None
```

In [9]:
```
ts = ts.set_index('Date')  # (2)
ts_w = ts.resample('W').mean()  # (3)
display(ts_w.head())
```

	X0	X1

Date		
2022-04-03	14.140000	-2.000000
2022-04-10	14.034000	-14.542000
2022-04-17	-5.430000	-8.295000
2022-04-24	29.620000	-21.387500
2022-05-01	-11.328333	-35.698333

(4) -11.33

In [10]:
```
ts['dow'] = ts.index.dayofweek  # (5)
ts_wday_ave = ts.groupby('dow').mean()  # (6)
wd = ['Mon', 'Tue', 'Wed', 'Thu', 'Fri', 'Sat', 'Sun']
plt.bar(wd, ts_wday_ave['X0'])  # (7)
display(ts.head())
display(ts_wday_ave)
```

Date	X0	X1	dow
2022-04-01	15.31	-1.94	4
2022-04-03	12.97	-2.06	6
2022-04-04	15.94	5.96	0
2022-04-05	25.87	-16.75	1
2022-04-06	16.51	-31.70	2

dow	X0	X1
0	28.805714	-69.920714
1	6.533571	-47.457143
2	16.036250	-62.760625
3	13.875556	-64.783889
4	19.513846	-70.936154
5	5.410000	-60.997500
6	17.989231	-56.599231

(8) -47.46