Introduction to Computer Programming

Week 9.1: Matplotlib - Plotting

In-class Demos

Example 1:
Import height and weight data from `sample_data/sample_student_data.txt` and plot a scatter plot of the data.

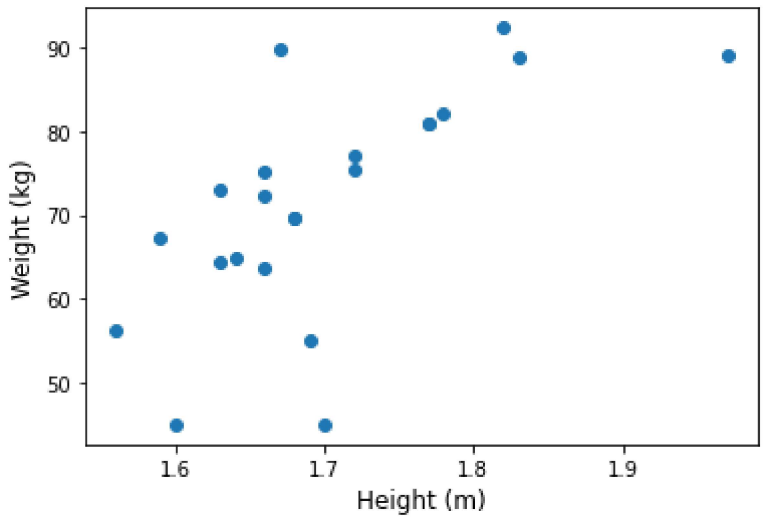
```
Subject    Sex    DOB    Height    Weight    BP
(ID)    M/F    dd/mm/yy    m    kg    mmHg
JW-1    M    19/12/1995    1.82    92.4    119/76
JW-2    M    11/01/1996    1.77    80.9    114/73
JW-3    F    02/10/1995    1.68    69.7    124/79

...
```

In [17]:

```
import matplotlib.pyplot as plt
import numpy as np

students = np.loadtxt('sample_data/sample_student_data.txt',
                      skiprows=2,
                      usecols=(3,4))

# Plot column 1 against column 0
plt.plot(students[:, 0], students[:, 1], 'o')

# Axes labels
plt.xlabel('Height (m)', fontsize=12)
plt.ylabel('Weight (kg)', fontsize=12)
```

Out[17]:

```
Text(0, 0.5, 'Weight (kg)')
```

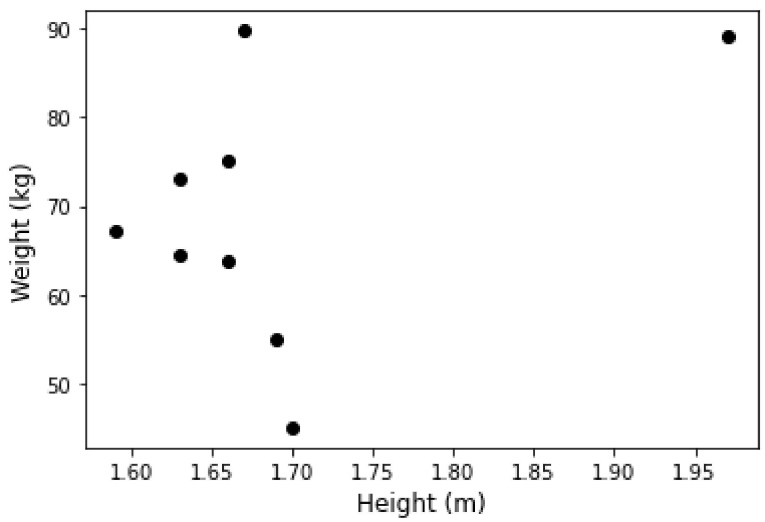


In [46]:

```
```

Out[46]:

```
Text(0, 0.5, 'Weight (kg)')
```



Example 2:
Import data from `sample_data/sample_student_data.txt` and plot a histogram of the height of female students.

In [14]:

```
students = np.loadtxt('sample_data/sample_student_data.txt', dtype=str) # mixed data types

# all rows, where column 1 == F
female = students[students[:,1]=='F']

print(female)
```

```
[['JW-3' 'F' '02/10/1995' '1.68' '69.7' '124/79']
 ['JW-5' 'F' '02/10/1995' '1.68' '69.7' '124/79']
 ['JW-7' 'F' '28/03/1996' '1.66' '72.4' '-']
 ['JW-9' 'F' '11/12/1995' '1.78' '82.1' '115/75']
 ['JW-10' 'F' '07/04/1996' '1.6' '45' '-/-']
 ['JW-14' 'F' '12/01/1996' '1.56' '56.3' '108/72']
 ['JW-15' 'F' '01/06/1996' '1.64' '65' '99/67']
 ['JW-19' 'F' '30/10/1995' '1.59' '67.3' '103/69']
 ['JW-22' 'F' '09/03/1996' '1.7' '45' '119/80']
 ['JW-24' 'F' '01/12/1995' '1.66' '63.8' '100/78']
 ['JW-25' 'F' '25/10/1995' '1.63' '64.4' '-/-']]
```

In [16]:

```
height = female[:, 3]           # select hieght data

height = height.astype(float)   # convert to float

# histogram
plt.hist(height, 10);           # equally spaced bins between minimum and maximum values ca

# add label
plt.xlabel('height')
plt.ylabel('frequency')
```

Out[16]:

```
Text(0, 0.5, 'frequency')
```