

```
In [1]: student_name = "Krystal Nguyen" # fill your name
student_id = "223212228" # fill your student ID
print("Student name: " + student_name)
print("Student ID: " + student_id)
```

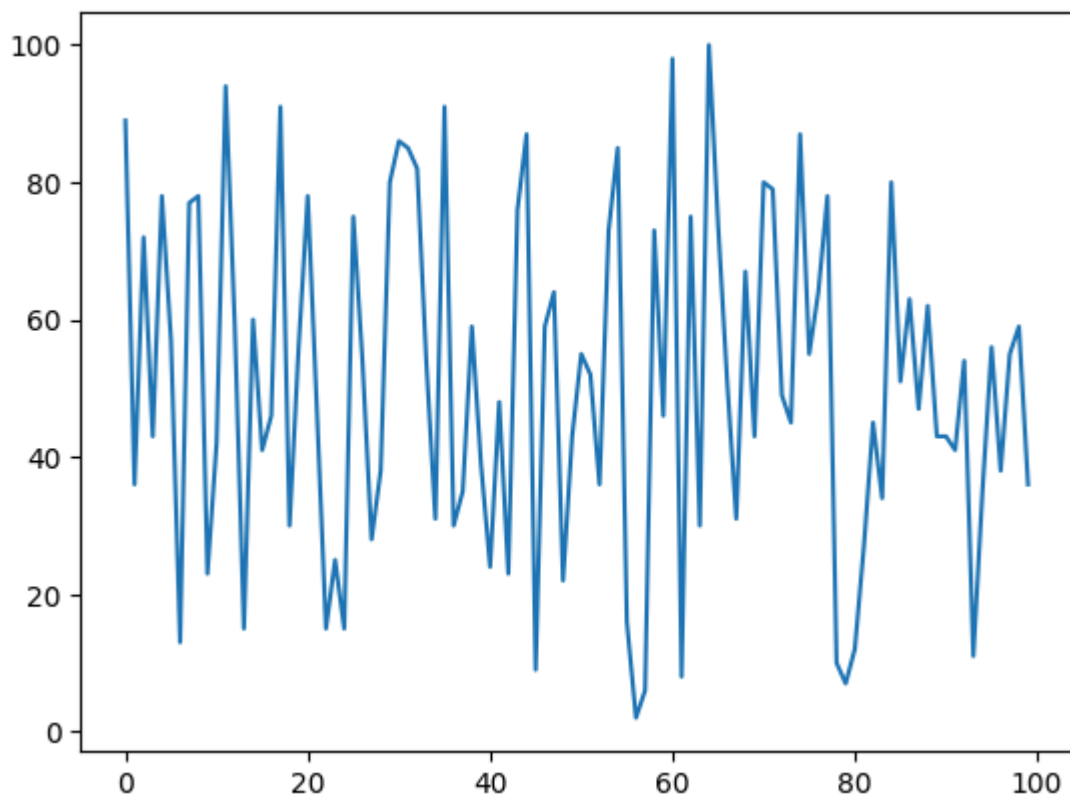
Student name: Krystal Nguyen
Student ID: 223212228

```
In [2]: import random
import matplotlib.pyplot as plt

n_values = 100
y_values = []

# Create data (y_values) randomly between 1 and 100.
for i in range(n_values):
    y_values.append(random.randint(1, 100))

x_values = range(n_values) # X is sequence of values 0-99
plt.plot(x_values, y_values)
plt.show()
```

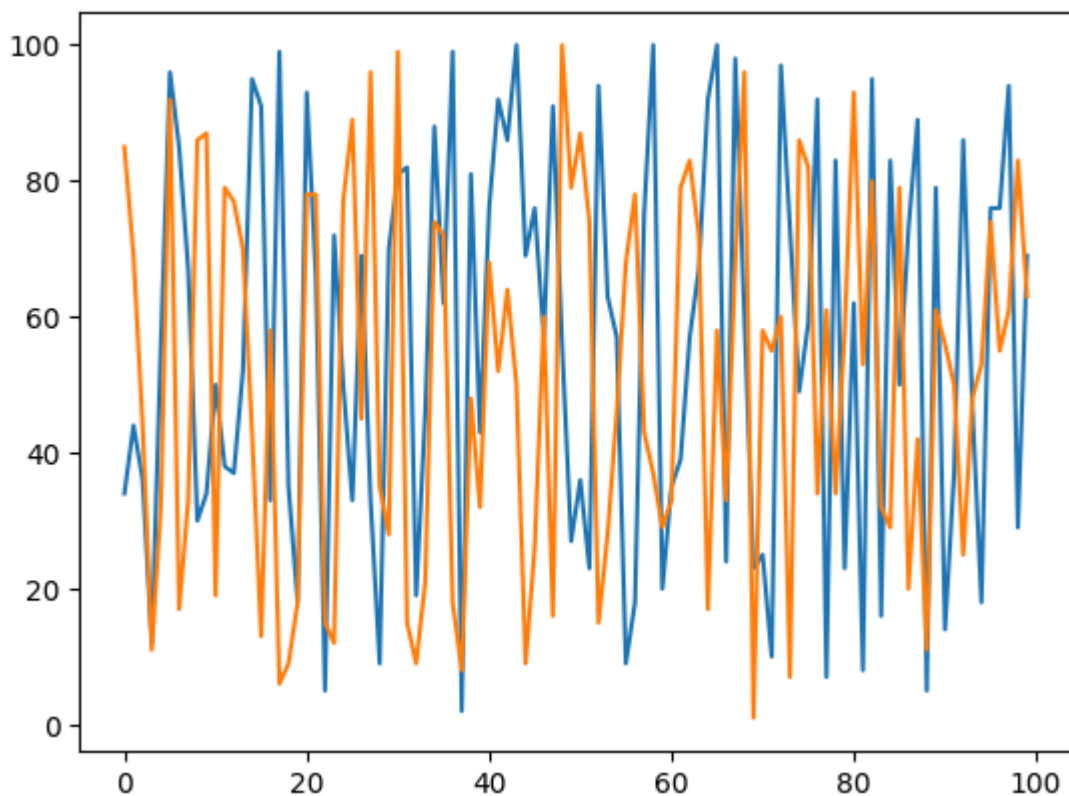


```
In [3]: # Plot 2 variables
#

n_values = 100
y_values_1 = []
y_values_2 = []

# Create data (y_values) randomly between 1 and 100.
for i in range(n_values):
    y_values_1.append(random.randint(1, 100))
    y_values_2.append(random.randint(1, 100))
```

```
x_values = range(n_values) # X is sequence of values 0-99
plt.plot(x_values, y_values_1)
plt.plot(x_values, y_values_2) # call plot again draws in the same graph
plt.show()
```



```
In [4]: # Activity 1: Create data so that the plot draws an
# ascending line (y_values increase at any rate).

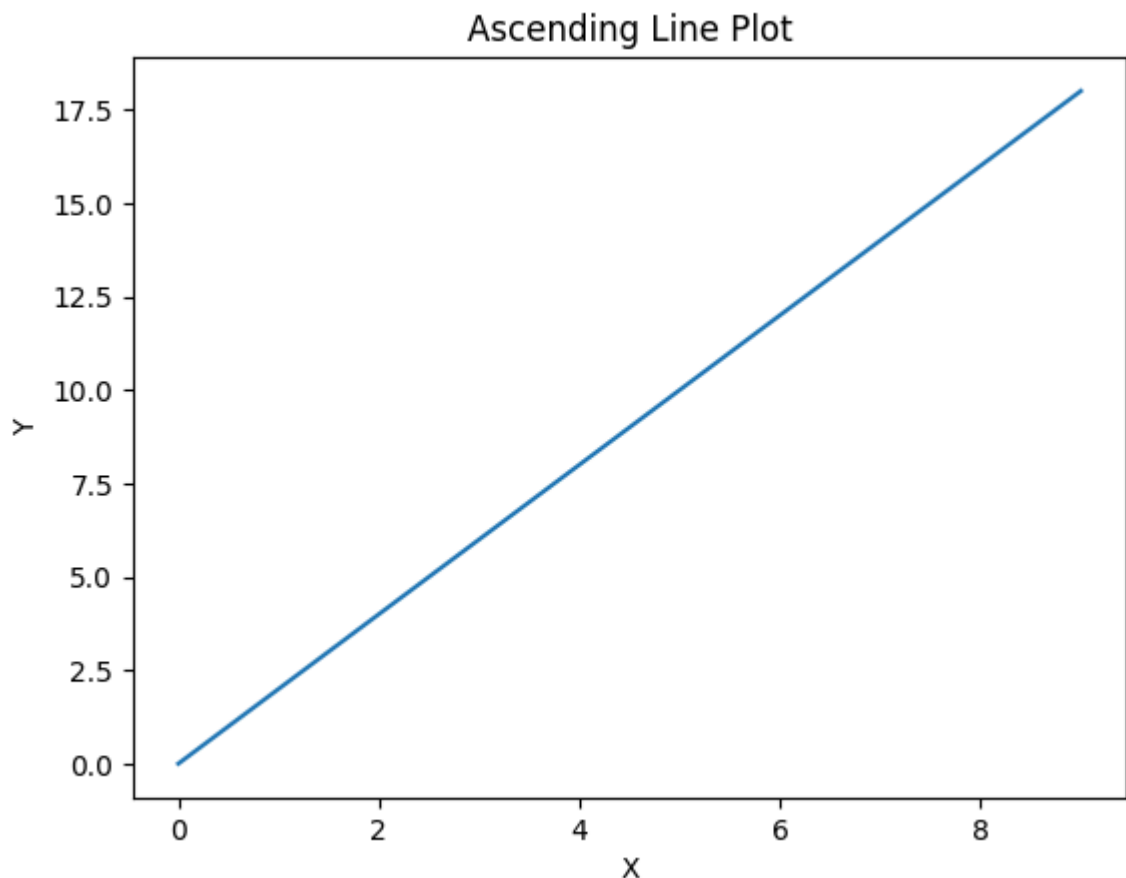
x_values = list(range(10))

# Generate y values that increase
y_values = [i * 2 for i in x_values] # Each y value is double its x value

# Print the data
print("x_values:", x_values)
print("y_values:", y_values)

plt.plot(x_values, y_values)
plt.xlabel('X')
plt.ylabel('Y')
plt.title('Ascending Line Plot')
plt.show()
```

```
x_values: [0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
y_values: [0, 2, 4, 6, 8, 10, 12, 14, 16, 18]
```



```
In [6]: # Activity 2: Create data so that the plot draws a
# descending line (y_values decrease at any rate).

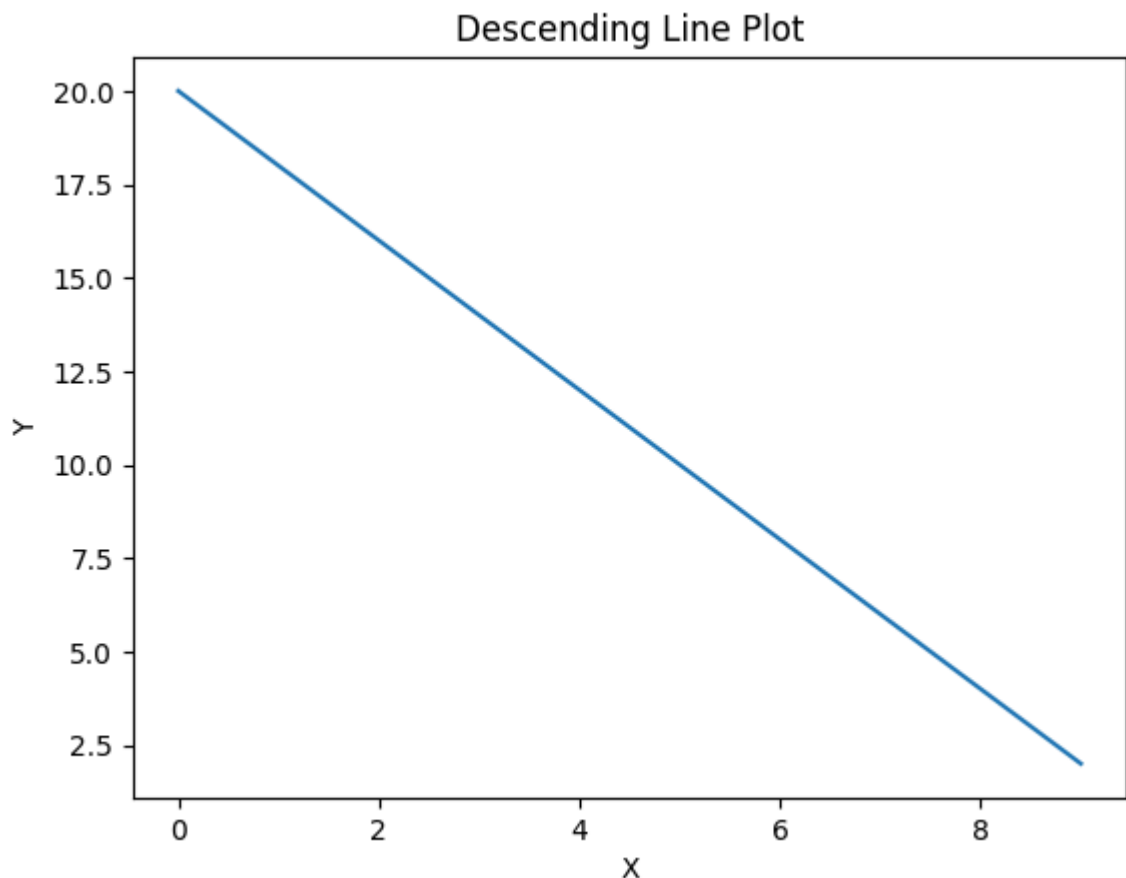
# Generate x values (e.g., 10 points)
x_values = list(range(10))

# Generate y values that decrease
y_values = [20 - i * 2 for i in x_values] # Start at 20 and decrease by

# Print the data
print("x_values:", x_values)
print("y_values:", y_values)

plt.plot(x_values, y_values)
plt.xlabel('X')
plt.ylabel('Y')
plt.title('Descending Line Plot')
plt.show()
```

```
x_values: [0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
y_values: [20, 18, 16, 14, 12, 10, 8, 6, 4, 2]
```



In [7]: *# Activity 3: Create data so that the plot draws a wave. You can consider using Python's math library, which has a sin function (detail https://www.w3schools.com/python/ref_math_sin.asp)*

```
import math

x_values = [i / 10 for i in range(100)]

# Generate y values using the sine function
y_values = [math.sin(x) for x in x_values]

# Print the first few data points
print("First 5 x_values:", x_values[:5])
print("First 5 y_values:", y_values[:5])

plt.plot(x_values, y_values)
plt.xlabel('X')
plt.ylabel('Y')
plt.title('Sine Wave Plot')
plt.grid(True)
plt.show()
```

```
First 5 x_values: [0.0, 0.1, 0.2, 0.3, 0.4]
First 5 y_values: [0.0, 0.09983341664682815, 0.19866933079506122, 0.295520
20666133955, 0.3894183423086505]
```

