

# Python Data Science & AI Machine Learning Program NYC

Learn programming fundamentals & data science in Python in a 2-week computer summer camp. Gain an in-depth understanding of Python, data science, including inputting, graphing, and analyzing data.

Group classes in NYC and onsite training is available for this course. For more information, email [hello@nextgenbootcamp.com](mailto:hello@nextgenbootcamp.com) or visit: <https://www.nextgenbootcamp.com/classes/python-data-science-summer-camp>



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## Course Outline

### Introduction to Programming

- History of Python
- Understanding Hardware
- Anaconda Distribution
- Jupyter Notebook Fundamentals
- Writing First Program (“Hello World”)

### Terminal Commands

- Navigate & Manipulate Directory Structures
- Edit Files
- Basic Scripting

### Python Fundamentals

- Data Types
- Operators
- Expression
- Indexing & Slicing
- Strings
- Conditionals
- Functions
- Control Flow
- Nested Loops
- Sets & Dictionaries

### Data Science Fundamentals

- Import Data
- Functions
- Basic Data Tool

### **Advanced Python Fundamentals**

- Lists
- Mutating Operations
- Tuples, Sets, Dictionaries
- Loops
- Control Flow
- List Comprehension
- Error Handling

### **Processing**

- String Methods
- Read & Write to Text Files
- Natural Language Processing
- Mini Project

### **Object Oriented Programming**

- Classes
- Constructors
- Object Methods
- Writing Modules
- Advanced Scripting
- Terminal & Socket Connection

### **Numerical Python**

- Arrays
- Universal Functions
- Concatenating, Indexing, Slicing
- Arithmetic & Boolean Operations

### **Python Data Analysis:Pandas 1**

- Data Series
- Data Frames
- Import CSV & Excel Files
- Organize Data Frames
- Data Manipulation
- Descriptive Statistics

### **Advanced Python**

- File Input
- User Input
- List Comprehension
- Packages

### **Data Analysis**

- Cleaning Data
- Filtering Data
- Advanced Grouping
- Pivot Tables

### **Data Visualization**

- Plotting with Matplotlib
- Scatter Plots
- Histograms & Bar Plots
- Custom Visualizations

## **Machine Learning Fundamentals**

### **Basic Regression Analysis**

- Linear Regression
- Mean squared error
- Training set vs Test set
- Cross validation

### **Advanced Regression Analysis**

- Multi-linear regression
- Feature engineering
- Overfitting

## **Classification**

### **Logistic Regression**

- Regression vs Classification
- Logistic Regression
- Sigmoid function

### **K-nearest Neighbors**

- K-nearest neighbors
- Model-based vs memory-based
- Parametric vs non-parametric
- Evaluating performance

## **Final Project**

### **Details**

- Curate Data
- Import, Clean, and Merge Data
- Analyze Data
- Visualize Data
- Present Results