

Syntax & Comments

Textbook

Syntax and Comments



Different programming languages have different [syntax](#)—words and symbols that tell the computer certain commands.

[Syntax](#) is a part of language definition which describes the rules used to build the words from a set of symbols. Syntax is a set of rules that need to be obeyed to build grammatically correct (not necessarily meaningful) sentences in any language.

Language Parts and Pieces

All language (including programming languages) are constituted by:

- an **alphabet** understood as a set of symbols used to build words of a certain language (e.g. the Latin alphabet for English, the Cyrillic alphabet for Russian, Kanji for Japanese, and so on).
- a **lexis**, also known as a **dictionary**, is a set of words the language offers its users (for example, the word "chat" is present both in English and French dictionaries, but its meaning is obviously different).
- **syntax** is a set of rules used to determine if a certain sequence of words forms a valid sentence.

semantics is defined as a set of rules which settle whether or not a certain phrase or sentence makes sense in a given language.

Programming languages also have these kinds of rules to follow.

Python syntax is different than many other languages because it is written in a way that is similar to the English language. Many computer languages end commands with semicolons, but python ends commands with a [line break](#) instead. (Create line breaks by pressing the enter key).

- Indentation is **very** important for Python syntax, and we will cover that in a future lesson.

Keywords: Keywords are reserved words that have special meaning in Python. They are part of the Python language and cannot be used as variable names, function names, or identifiers. Examples include `if`, `else`, `for`, `while`, `True`, `False`, and `import`.

Identifiers: Identifiers are names used to identify variables, functions, classes, or other objects. In Python, an identifier must start with a letter (A-Z or a-z) or an underscore (`_`) and can be followed by letters, digits (0-9), or underscores. Identifiers are case-sensitive, meaning `myVariable` and `myvariable` are different.

Statement: A line of code that performs an action or does something in the program. It can control the flow of the program, like making decisions or repeating tasks. Example: `myvariable = "Hello"`

Expression: A combination of values, variables, and operators that the program evaluates (calculates) to produce a result. It usually returns a value. `myvariable = 2 + 5`. We will learn more expressions in upcoming lessons.

Comments

Comments in python are sections of code that do not affect how the code runs. They can be used to put notes in the code or explain what the code is doing. Comments are designated with this symbol: `#`.

```
1 # This is a comment
2 print('Did you see my comment?')
3
4 # This is another comment
```

Try it!

For the above example, the phrase "This is a comment" is a comment but the print statement is not. So in this code the print statement will run normally and the comment will do nothing to affect the program. Here is an example of how to use a comment to prevent code from running:

```
1 # The next line will not run
2 # print('THIS LINE DOES NOT RUN')
3
4 # The next line will run like normal
5 print('This line is not commented')
```

Try it!

Editing All Instances of a Word At Once

Sometime you'll want to edit all instances of a word in a chunk of code at once. This is done by highlighting the code you want, then press **command + shift + L**. (Or **ctrl + shift + L**). This will highlight all of the places in your code where that word appears and allows you to edit them all at once. You can create more code faster with this keyboard shortcut.

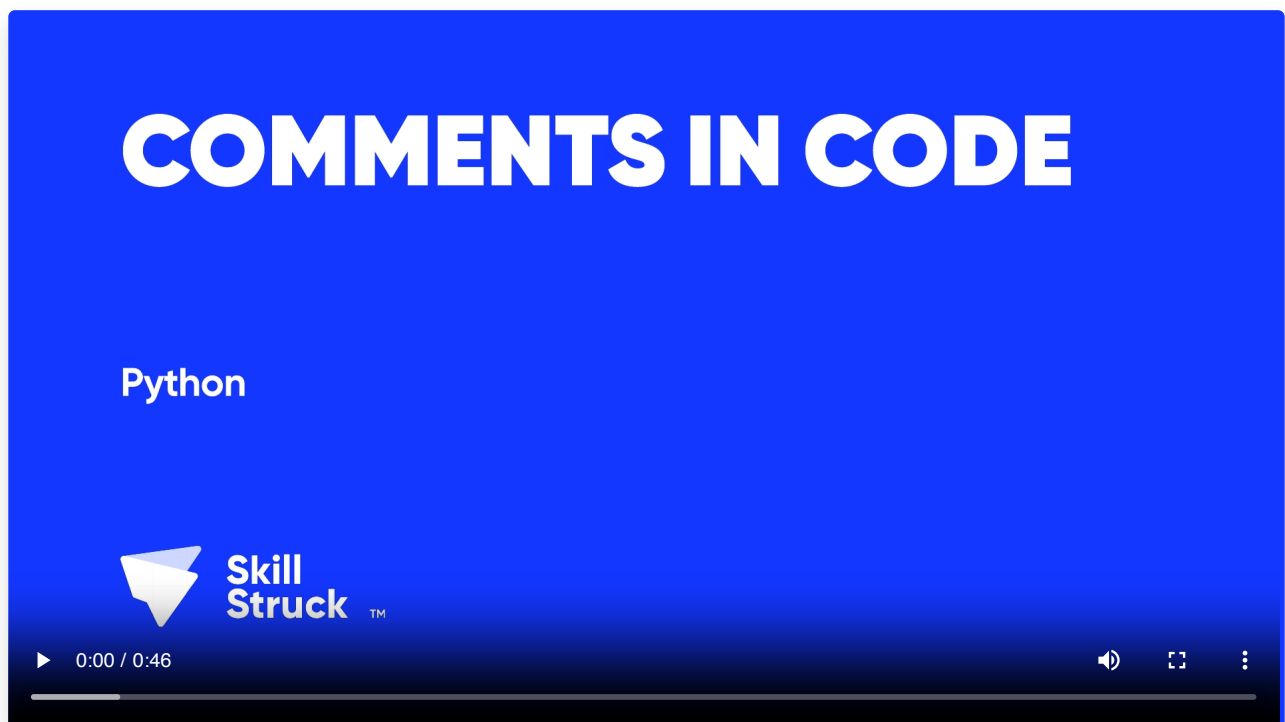
Documenting Code

Commenting is super important for documenting your code. Adding comments that explain your code will help other people understand what your code is doing. Adding explanations about your code is referred to as documenting your code. Programming is highly collaborative. This means that many programmers look at many resources of code for ideas and help. Someone might look at your code someday to help them understand how to do something! This is why it's important to add comments into your code at key places that explain what your code is doing.

PEP-8 Code Styling

Code that is clean and easy to read is considered "best practice." Python code does have a list of guidelines to help write clean code. These guidelines are called the PEP-8 recommendations. You can learn more [here](#).

There are a lot of guidelines. We recommend that rather than memorizing that list, just continue learning to code and pay attention to the way code is presented in the examples and videos. As you learn to code in the styling that is presented in these lessons, your code will be clean.



Checkpoint

Simple Programs

Practice adding a comment to your code!

1. Create a variable and assign it to a string
2. Create a comment explaining what the variable is

Requirements:

- Create a variable
- Add a python comment to your code

Questions (10)

1. What is syntax in programming?

MULTIPLE CHOICE

Choose the correct answer:

- A. The order of the letters, symbols, and words in a programming language.
- B. The color that code shows up in the code editor.
- C. Data about programming languages.
- D. The way code is formatted for readability.

2. What is the purpose of a comment in Python code?

MULTIPLE CHOICE

Choose the correct answer:

- A. To end a command.
- B. To make the code run smoothly.
- C. To prevent code from running.
- D. To explain or provide notes about the code.

3. Which of the following lines will NOT run in the code below?

MULTIPLE CHOICE

```
# The next line will not run print('THIS LINE DOES NOT RUN') print('This line is not commented')
```

Choose the correct answer:

- A. Line 1
- B. All 3 lines will run
- C. Lines 2 and 3
- D. Line 3
- E. Line 2

4. True or False: Indentation is very important in Python

MULTIPLE CHOICE

Choose the correct answer:

- A. True
- B. False

5. How do you create a line break?

MULTIPLE CHOICE

Choose the correct answer:

- A. tab key
- B. enter/return key
- C. space bar
- D. mouse click

6. What makes Python syntax different from most other languages?

MULTIPLE CHOICE

Choose the correct answer:

- A. It is similar to English syntax.
- B. It uses comments in the program.
- C. It uses semicolons at the end of a thought.
- D. The order of parentheses matters.

7. How do you create a comment in Python?

MULTIPLE CHOICE

Choose the correct answer:

- A. <!-- Here is my comment -->
- B. // Here is my comment
- C. /* Here is my comment */
- D. # Here is my comment

8. Debug (fix) the following code:

DEBUG CODE

Code to Debug:

```
1 ** Here is my comment
```

9. Debug the following code. Assume you were trying to create a comment.

DEBUG CODE

Code to Debug:

```
1 I want this line to be a comment.
```

10. What does "documenting your code" mean?

Choose the correct answer:

- A. Adding explanations about your code.
- B. Keeping a tally of the number of lines of code in your project.
- C. Saving your code to a file on your computer.
- D. Keeping a list of all the code files in your project.

Challenges (4)

1. Commenting Your Parents

What is something your parent always tells you?

Create **3 print statements** that each print something different your parent always tells you.

Directly below each print statement, create a **comment** explaining why you think they tell you that all the time.

Requirements:

- 3 print statements about things your parent says
- 3 comments about why your parent says those things

2. How are you feeling today?

Have you ever thought about how you are feeling today as a sound? For example, today I am feeling like a kazoo because I'm feeling excited. Or maybe you are feeling like a color or a flavor?

1. Create a variable named `sound` and assign it to a sound that is how you are feeling today.
2. Create another variable named `color` and another variable named `flavor`.
3. Assign each variable to an example of how you are feeling today.
4. On the line directly above each variable, **write a comment** that explains why you chose what you did.

Requirements:

- Write 3 different comments.
- Variable named `color`
- Variable named `sound`
- Variable named `flavor`

3. Snow Day!

Have you ever been somewhere that snows a lot? Do you enjoy the snow? What do you like to do on a snowy day? Do you think you would like to go out sledding or stay inside with hot chocolate? What would you do on a free Saturday that snowed 3 feet?

If you've never been somewhere that has snow, what do you imagine you would like to do?

1. Write a program that gets three inputs and assigns them to **three variables** - the morning, afternoon, and evening.
2. The user would then **input** what they would choose to do during those times of day.
3. **Print** out each of the chosen activities.
4. At the top of the code, include a **comment** that explains what the program is doing.

Requirements:

- Create a variable for `morning`
- Use three `input()` commands to ask what they would do in the morning, afternoon, and evening.
- Assign each input to its correct variable.
- Print each variable in a print statement.
- Include a comment at the top of the code.
- Create a variable for afternoon
- Create a variable for evening

4. Your Favorite Movies

In your opinion, which movies are the all time best?

Create **3 print statements** that say your top 3 favorite movies.

Below each print statement, include a **comment** explaining why that movie is your favorite.

Requirements:

- 3 print statements with your top 3 favorite movies.
- 3 comments explaining why those are your top 3 favorites.

Answer Keys & Solutions

Checkpoint Solutions

Simple Programs

```
1 color = "purple"  
2 #This is the code for a purple turtle!
```

Questions

1. What is syntax in programming?

MULTIPLE CHOICE

Correct Answer:

- A. The order of the letters, symbols, and words in a programming language. ✓ Correct
- B. The color that code shows up in the code editor. ✗ Incorrect
- C. Data about programming languages. ✗ Incorrect
- D. The way code is formatted for readability. ✗ Incorrect

Explanation:

Syntax refers to the characters used in the code.

2. What is the purpose of a comment in Python code?

MULTIPLE CHOICE

Correct Answer:

- A. To end a command. ✗ Incorrect
- B. To make the code run smoothly. ✗ Incorrect
- C. To prevent code from running. ✗ Incorrect
- D. To explain or provide notes about the code. ✓ Correct

Explanation:

Comments explain what the code is doing

3. Which of the following lines will NOT run in the code below?

MULTIPLE CHOICE

Correct Answer:

- A. Line 1 ✓ Correct
- B. All 3 lines will run ✗ Incorrect
- C. Lines 2 and 3 ✗ Incorrect
- D. Line 3 ✗ Incorrect
- E. Line 2 ✗ Incorrect

Explanation:

The # hashtag symbol creates a comment.

4. True or False: Indentation is very important in Python

MULTIPLE CHOICE

Correct Answer:

- A. True ✓ Correct
- B. False ✗ Incorrect

Explanation:

Indentation affects how Python code runs.

5. How do you create a line break?

MULTIPLE CHOICE

Correct Answer:

- A. tab key ✗ Incorrect
- B. enter/return key ✓ Correct
- C. space bar ✗ Incorrect
- D. mouse click ✗ Incorrect

Explanation:

A line break is just manually going to a new line.

6. What makes Python syntax different from most other languages?

MULTIPLE CHOICE

Correct Answer:

- A. It is similar to English syntax. ✓ Correct
- B. It uses comments in the program. ✗ Incorrect
- C. It uses semicolons at the end of a thought. ✗ Incorrect
- D. The order of parentheses matters. ✗ Incorrect

Explanation:

Python feels similar to spoken languages.

7. How do you create a comment in Python?

MULTIPLE CHOICE

Correct Answer:

- A. `<!-- Here is my comment -->` ✗ Incorrect
- B. `// Here is my comment` ✗ Incorrect
- C. `/* Here is my comment */` ✗ Incorrect
- D. `# Here is my comment` ✓ Correct

Explanation:

`/*` is used for CSS. `<!--` is used for HTML. `//` is used for JavaScript

8. Debug (fix) the following code:

DEBUG CODE

Incorrect Code:

```
1 ** Here is my comment
```

Correct Solution:

```
1 # Here is my comment
```

Explanation:

Did you use this symbol? #

9. Debug the following code. Assume you were trying to create a comment.

DEBUG CODE

Incorrect Code:

```
1 I want this line to be a comment.
```

Correct Solution:

```
1 #I want this line to be a comment.
```

Explanation:

Did you use this symbol? #

10. What does "documenting your code" mean?

MULTIPLE CHOICE

Correct Answer:

A. Adding explanations about your code.

✓ Correct

B. Keeping a tally of the number of lines of code in your project.

✗ Incorrect

C. Saving your code to a file on your computer.

✗ Incorrect

D. Keeping a list of all the code files in your project.

✗ Incorrect

Explanation:

Documenting code is adding comments that describe what your code is doing.

Challenges

1. Commenting Your Parents

Solution:

```
1 print("Clean your room!")
2 # My room is dirty all the time
3
4 print("Don't talk to strangers.")
```

```
5 # It's probably a good idea
6
7 print("I love you!")
8 # She really cares about me.
```

2. How are you feeling today?

Solution:

```
1 #I chose eagle call because I feel like I'm flying with this code
2 sound = "eagle call"
3 #I chose green because I'm still learning
4 color = "green"
5 #I chose grape because it sounds almost like "great"
6 flavor = "grape"
```

3. Snow Day!

Solution:

```
1 #Here is what I like to do!
2 morning = input("What do you like to do in the morning?")
3
4 afternoon = input("What do you like to do in the afternoon?")
5
6 evening = input("What do you like to do in the evening?")
7
8
9 print(morning)
10 print(afternoon)
11 print(evening)
```

4. Your Favorite Movies

Solution:

```
1 print("The best movie is End Game")
2 #It wraps up the Marvel universe super well!
3
4 print("The second best movie is Into the Spiderverse")
5 #I love the animation!
6
7 print("The third best movie is Star Wars")
8 #Star Wars reminds me of my childhood!
```

