

Course  
&  
Test Series

Error Messages and Comments

Error Messages and Comments

How to read errors?

A natural part of programming is making mistakes. Even experienced programmers make mistakes when writing code. Errors may result when mistakes are made when writing code.

- The computer requires very specific instructions telling the computer what to do.
- If the instructions are not clear, then the computer does not know what to do and gives back an error.
- When an error occurs, Python displays a message with the following information:
  1. The line number of the error.
  2. The type of error (Ex: SyntaxError).
  3. Additional details about the error.

Example: Typing `print "Hello!"` without parentheses is a syntax error. In Python, parentheses are required to use `print`. When attempting to run `print "Hello!"`,

Python displays the following error:

Traceback (most recent call last):  
File `"/home/student/Desktop/example.py"`, line 1  
`print "Hello" ^`

SyntaxError: Missing parentheses in call to 'print'. Did you mean `print("Hello")`?

The caret character (^) shows where Python found the error.

- Sometimes the error may be located one or two lines before where the caret symbol is shown because Python may not have discovered the error until then.

Traceback is a Python report of the location and type of error. The word `traceback` suggests a programmer trace back in the code to find the error if the error is not seen right away.

Common types of errors:

Different types of errors may occur when running Python programs. When an error occurs, knowing the type of error gives insight about how to correct the error.

The following table shows examples of mistakes that anyone could make when programming.

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| Mistake                                 | Error message                                  | Explanation  |
|---|--|--|
| <pre>print("Have a nice day!")</pre>    | SyntaxError: unexpected EOF while parsing      | The closing parenthesis is missing. Python is surprised to reach the end of file (EOF) before this line is complete. |
| <pre>word = input("Type a word: )</pre> | SyntaxError: EOL while scanning string literal | The closing quote marks are missing. As a result, the string does not terminate before the end of line (EOL).        |
| <pre>print("You typed:", wurd)</pre>    | NameError: name 'wurd' is not defined          | The spelling of word is incorrect. The programmer accidentally typed the wrong key.                                  |
| <pre>prints("You typed:", word)</pre>   | NameError: name 'prints' is not defined        | The spelling of <code>print</code> is incorrect. The programmer accidentally typed an extra letter.                  |
| <pre>print("Hello")</pre>               | IndentationError: unexpected indent            | The programmer accidentally typed a space at the start of the line.  |
| <pre>print("Goodbye")</pre>             | IndentationError: unexpected indent            | The programmer accidentally pressed the Tab key at the start of the line.  |

**Comments in Python**

A comment is a piece of text in your code that **Python ignores when executing the program**.

They are used to explain the code, make notes, or temporarily disable some part of the program.

**When writing comments:**

- The # character should be followed by a single space. Ex: # End of menu is easier to read than #End of menu.
- Comments should explain the purpose of the code, not just repeat the code itself. Ex: # Get the user's preferences is more descriptive than # Input item1 and item2.

**Single-line Comments**

- Start with a # (hash symbol).
- Everything after # on that line is ignored by Python.

**Example:**

# This is a single-line comment

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```
print("Hello, World!") # This prints a message
```

**Output:**

Hello, World!

**Multi-line Comments (using # on each line)**

You can write comments on multiple lines by putting # before each line.

**Example:**

```
# This program adds two numbers  
# and prints the result  
a = 5  
b = 3  
print(a + b)
```

**Output:**

8

**Docstrings (Triple Quotes ''' or ''')**

Although not exactly comments, Python lets you write **documentation strings** (docstrings) using triple quotes.

These can span multiple lines and are used to describe **functions, classes, or modules**.

**Example:**

```
'''This function prints a greeting message'''  
print("Hello there!")
```

**Output:**

Hello there!

**Why Use Comments?**

- Make the code **easier to understand** for yourself and others.
- Explain complex logic.
- Temporarily **disable code** during testing.

**Assignment**

Ques 1: Write a Python program to find the square of a number entered by the user.

- Use the **\*\* operator** for calculation.
- Add comments in your code to explain each step (taking input, calculating, and printing).

Ques 2: Write a Python program to calculate the area of a rectangle.

- Take length and width as variables.

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- Use the formula:  $\text{area} = \text{length} \times \text{width}$ .
- Add comments explaining the formula and each step.

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