

## **Python should be taught in first-year Computer Science classes**

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**Main claim C1:** Python should be taught in first-year CS

**Reason R1 (for C1) / Claim C2:** ...because its syntax is simpler than other languages.

**Warrant W1 (R1  $\rightarrow$  C1):** Simple syntax is important because students who are new to programming often have great difficulty with syntax, and lowering this barrier will help them focus on learning algorithmic concepts, which is the purpose of first-year CS.

**Restate claim C2:** Python is simpler than languages like C++ and Java,

**Reason R2 (for C2) / Claim C3:** ...because Python is a scripting language, and scripting languages have simpler syntax than system languages.

**Reason R3 (for C3):** In Python, statements are terminated with an end-of-line, rather than a semicolon; block structure is indicated by indentation, rather than with brackets.

**Refinement of Warrant W1:** Simplifying these elements is valuable because semicolons and brackets are common stumbling blocks for beginning programmers.

**Evidence E1 (for R3):** For example, the following code is a common bracketing error in C++ or Java:

```
if (x < 0)
    cout << "x was negative";
    x = -x;
```

However, in Python the corresponding code executes as expected, since the indentation itself determines the block:

```
if x < 0:
    print "x was negative"
    x = -x
```

**Transition to objection:** Although Python's indenting rules provide a simple mechanism for determining a block,

**Objection O1:** ...one of the criticisms of Python is that students may have difficulty with the strict indenting rules.

**Claim C4 to deal with O1:** Indentation, however, is not likely to be a problem,

**Reason R4 (for C4):** because current editors and IDEs for Python provide extensive indentation support, such as automatic indenting and highlighting the current block,

**Evidence E2 (for R4):** as can be seen in the popular SPE editor shown in Figure 1.

**Transition to conclusion:** In summary,

**Restatement of main claim and reason:** Python's simple syntax, which allows students to focus on important concepts, make it an ideal choice for first-year computer science.