SNS COLLEGE OF ENGINEERING
Kurumbapalayam (Po), Coimbatore – 641 107
An Autonomous Institution
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DEPARTMENT OF CSE

19IT103 – COMPUTATIONAL THINKING AND PYTHON PROGRAMMING

- **A readable, dynamic, pleasant, flexible, fast and powerful language**

UNIT II DATA TYPES, EXPRESSIONS, STATEMENTS

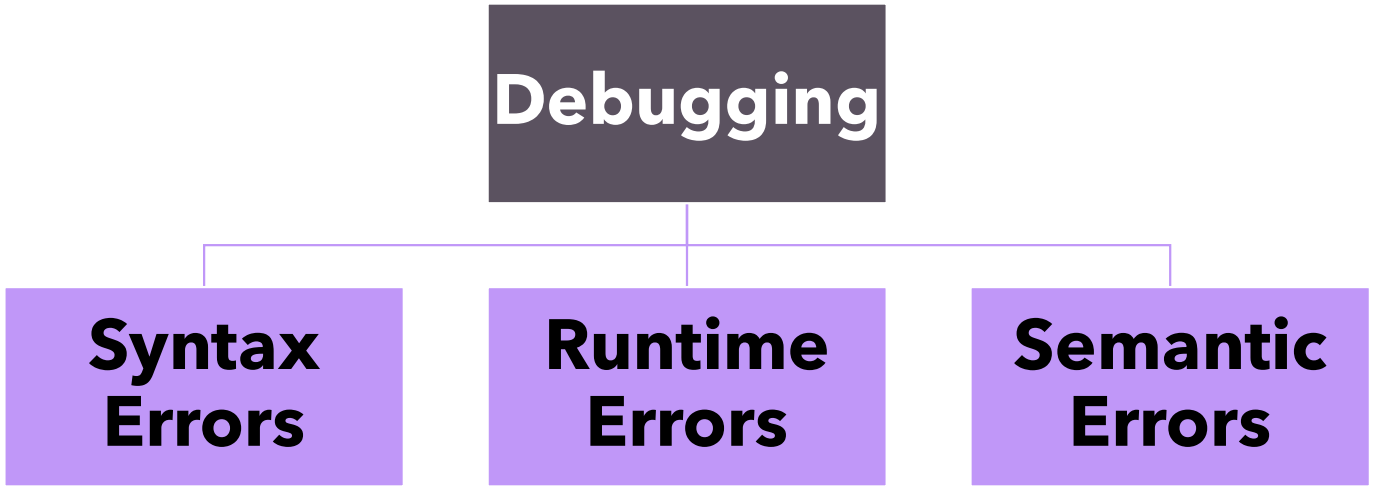
- Python interpreter and interactive mode, debugging; values and types: int, float, boolean, string , and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

Recap

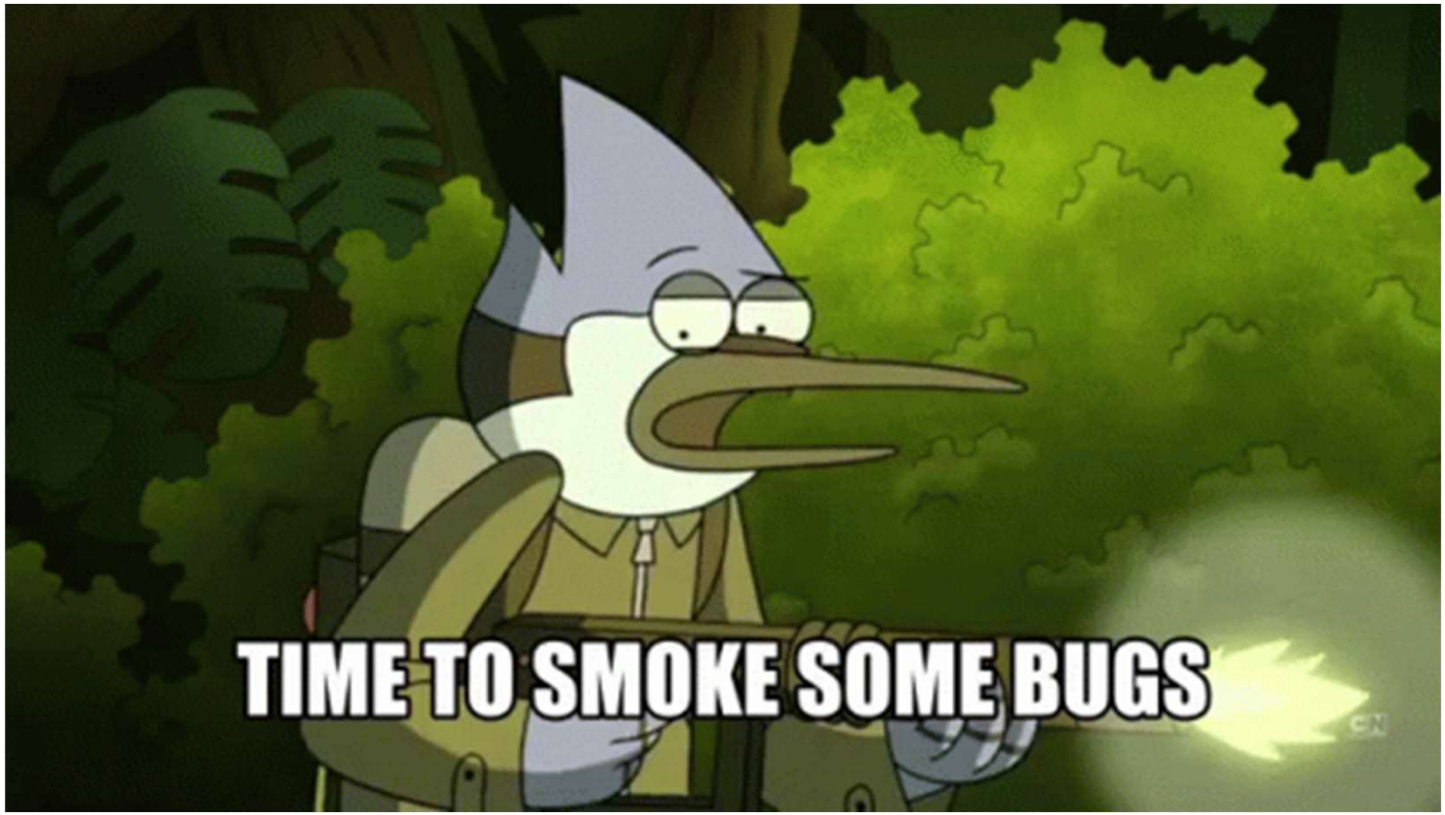
- **Compiler:** A compiler is a program that translates source code into object code to be understood by a specific central processing unit (CPU).
- **Interpreter:** An Interpreter directly executes instructions written in a programming or scripting language without previously converting them to an object code or machine code.
- Features of Python
- Python Interpreter
  - Interactive Mode
  - Script Mode

Debugging

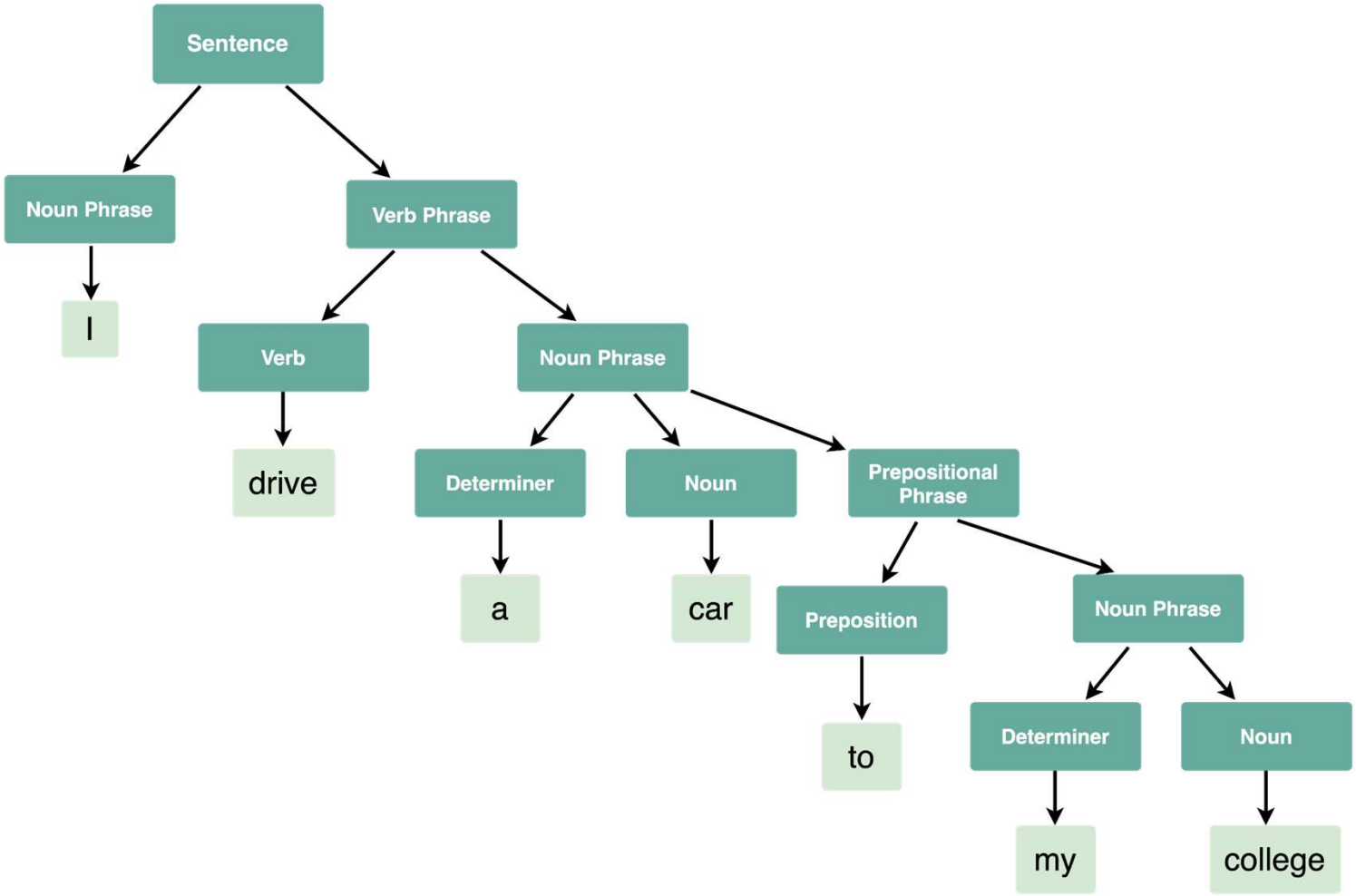
- Programming is error-prone.
- Programming errors are called bugs and the process of tracking them down is called debugging.



Debugging



Syntax


Sentence
Noun Phrase
Verb Phrase
I
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drive
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Prepositional Phrase
a
car
Preposition
Noun Phrase
to
Determiner
Noun
my
college

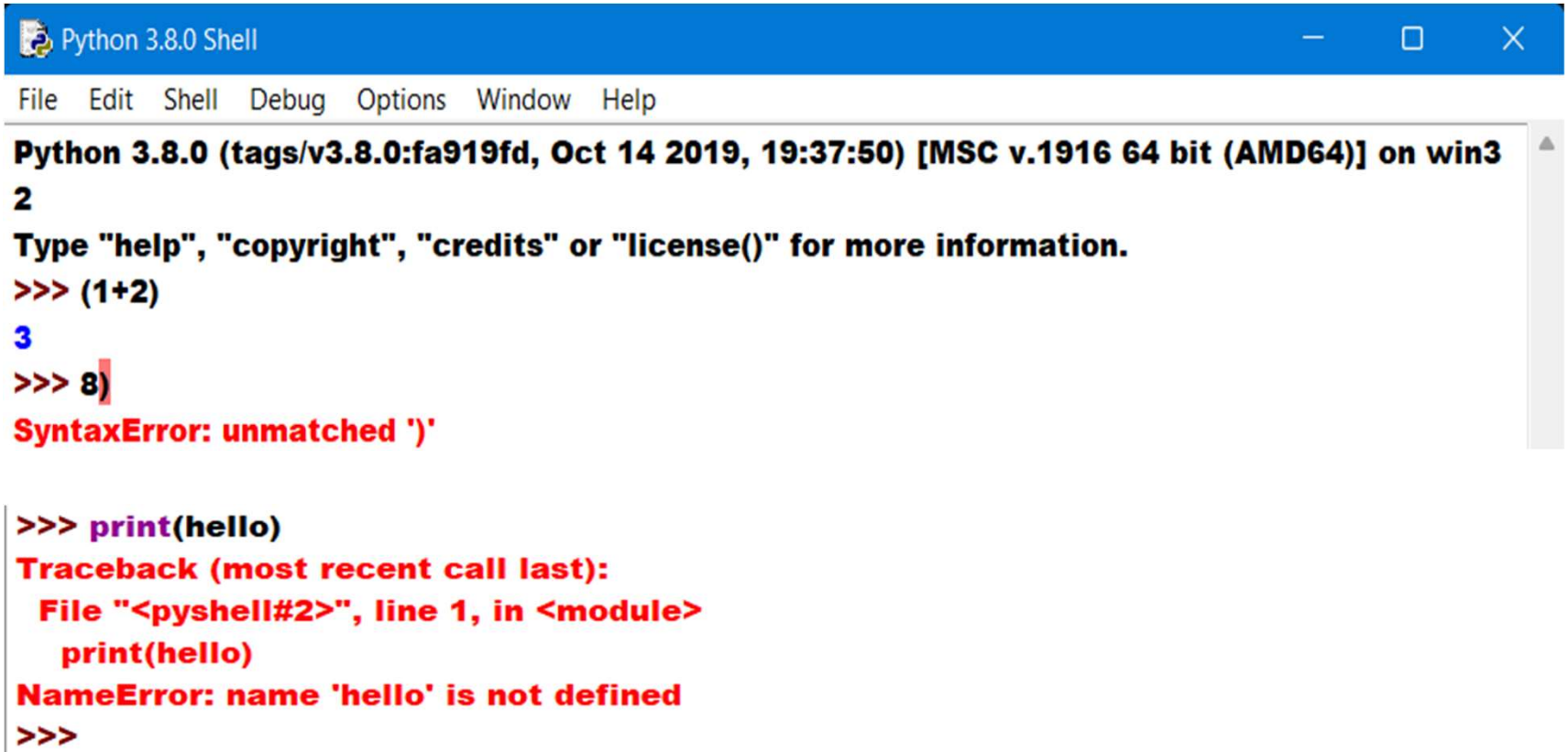
Syntax

- Syntax refers to the rules that define the structure of a language.
- Syntax in computer programming means the rules that control the structure of the symbols, punctuation, and words of a programming language.
- If the syntax of a language is not followed, the code will not be understood by a compiler or interpreter.

Syntax errors

- Python can only execute a program if the syntax is correct; otherwise, the interpreter displays an error message.
- Every language has its own set of rules that make up its basic syntax.
- For example, parentheses have to come in matching pairs, so (1 + 2) is legal, but 8) is a syntax error.

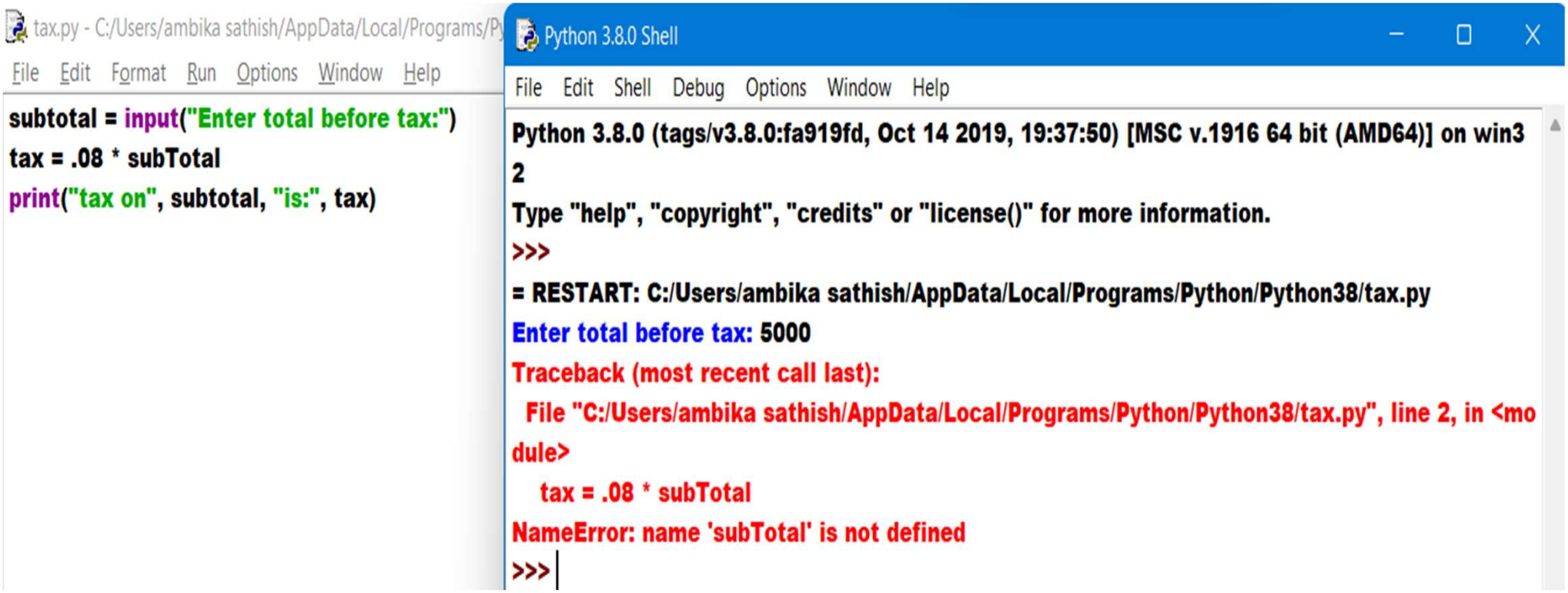
Syntax errors



Runtime errors

- This error does not appear until after the program has started running.
- These errors are also called exceptions because they usually indicate that something exceptional (and bad) has happened.
- Here are some examples of common runtime errors you are sure to encounter:
  - Misspelled or incorrectly capitalized variable and function names
  - Attempts to perform operations (such as math operations) on data of the wrong type (ex. attempting to subtract two variables that hold string values)
  - Dividing by zero
  - Attempts to use a type conversion function such as **int** on a value that can't be converted to an int.

Runtime errors



Semantic errors

- The third type of error is the semantic error.
- If there is a semantic error in your program, it will run successfully in the sense that the computer will not generate any error messages, but it will not do the right thing.
- The problem is that the program you wrote is not the program you wanted to write.
- Identifying semantic errors can be tricky because it requires you to work backward by looking at the output of the program and trying to figure out what it is doing.

Semantic errors