

LIN6209

Coding for Linguists

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Weekly Topics

That weeks assignment is assessed →



Week 1 - Getting Started

- Python?
- Installing Python
- Starting Python
- Writing Python
- Saving your work
- Variables & functions
 - Creating and using variables
 - Using functions
- Debugging
- Objects and object types
 - Integer: `int()`
 - Floating point: `float()`
 - Boolean: `bool()`
 - String (text): `str()`
- Operators
 - `+`, `-`, `*`, `/`, `//`, `%`
 - `<`, `<=`, `==`, `!=`, `>=`, `>`
 - `and`, `or`, `not`
 - `[]`, `is`, `in`

Week 2 - Functions

- Built-in functions
- Parts of a Function
 - Name
 - Parameters
 - {hidden internal code}
 - Return value
- Defining a function
 - Keyword: def
 - Keyword: pass
 - Keyword: return
- Saving a function
- Re-using a function
 - Keyword: import
 - Keyword: from
- Testing & Debugging
- Good programming style
- The Python standard library and the Python ecosystem

This weeks assignment is assessed



Week 3 – Conditional execution

- Conditional execution
 - Keyword: if
 - Keyword: else
 - Keyword: elif
- Boolean logic
- Errors & Exceptions
- Iteration
 - Keyword: while
 - Keyword: break
 - Keyword: continue
- Testing & Debugging (again)

Week 4 – Collections

- Mutable & Immutable objects
- Collections
 - String
 - List
 - Tuple
 - Range
 - Set
 - Frozenset
 - Dictionary
- Errors & Exceptions
- Iteration
 - Keyword: for
- Comprehensions
- More Collections
 - Queue
 - Deque
 - Stack
 - Tree
 - Graph



Week 5 – Reading and Writing Files

- What a file is
 - A stream of bits
 - Binary, text, CSV ...
 - Records, fields
- Creating, writing, reading, updating, deleting
- Encodings
 - ASCII
 - Unicode
- Keyword: with
 - Always prefer this statement for reading and writing files
- Built-in functions:
 - open()
 - close()
 - know about these but DoNotUse them

Week 6 – Analysing text (part 1)

- Counting
 - Characters
 - Words
 - Sentences
 - Paragraphs
 - Other structures
- Length
 - Words
 - Sentences
 - Paragraphs
- Adjacency
 - Words
 - Letter sequences
- Other measures
 - Mean, Mode, Median, Variation
- Good programming style (again)

This weeks assignment is assessed



Week 7 – Reading Week

- Assignment
 - Analysing some given texts

Week 8 – Regular Expressions

- What a regular expression is
- The RE library
- Meta-characters
 - . ^ \$ * + ? { } [] \ | ()
 - . Any character except a newline
 - [] Character class
 - ^ Compliment of class
 - \ Backslash
 - * Zero or more times
 - + One or more times
 - ? Once or zero times
 - {m, n} At least m times and at most n times
 - | Logical OR
 - ^ At the beginning of a line
 - \$ At the end of a line
 - () Grouping
 - \A At the start of a string
 - \Z At the end of a string
 - \B At a word boundary
 - \b Inside a word
 - (?= ...) Positive lookahead assertion
 - (?! ...) Negative lookahead assertion

Week 9 – Analysing text (part 2)

- Using real data
 - gutenberg.org
 - corpusdata.org
 - talkbank.org
 - [Beautiful Soup library](#)
- Test data
 - Designing and creating test data
 - www.mockaroo.com
- Data cleansing
- Building software
 - Requirements
 - Analysis
 - Design
 - Build
 - Test
 - Evaluate
- Analysing data
 - Regression analysis
 - Cluster analysis



Week 10 – Data visualisation

- Ready-made libraries
 - matplotlib.org
 - seaborn.pydata.org
 - bokeh.org
 - plotly.com/python
- Publishable graphics
 - Paper
 - Web
- Line graphs
- Charts
- Scatter plots
- Contour maps
- Heatmaps
- Geographic projections
- Animated charts
- Real-time plots

Week 11 – Jupyter Notebooks

- A project notebook
 - A readable document
 - Mixes code, text and graphics
 - Editable
 - Executable
 - Dynamic
 - It makes your work look good
- A record of your work
 - In your browser
 - On your PC
 - Working in teams



Week 12 – Current Trends

- GIT
- Anaconda
- Pandas
- Scikit-learn
- TensorFlow
- ST
- NLTK
- Other languages
- ANTLR
- Big data
- Machine learning
- Artificial intelligence
- Chatbots
- Sentiment analysis
- Opportunities
- Limitations

Each class includes

- PowerPoint slides presented
- Practice exercises
- Weekly assignment
 - A review of the previous weeks assignment
 - This weeks assignment, explained