Testing, PyCogent scripting and work with Greengenes

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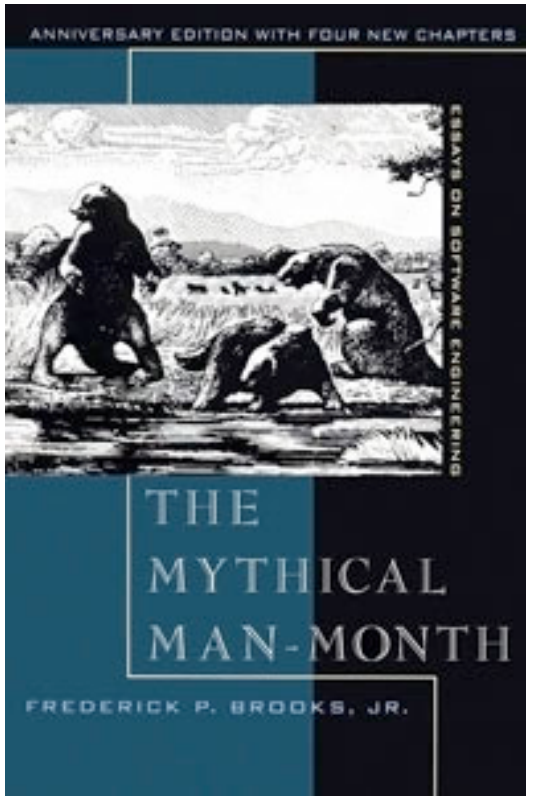
Overview

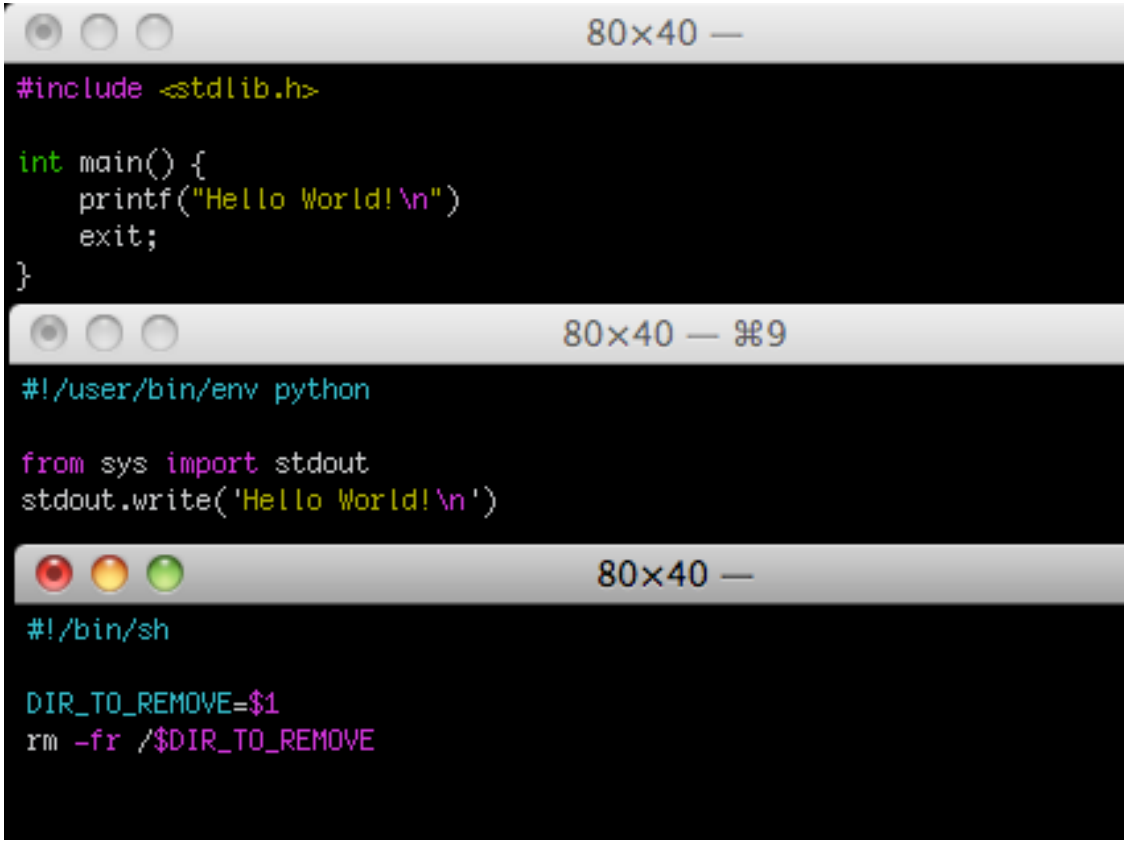
- Discuss testing and why testing is important in software development
- Talk about the tax2tree project in collaboration with Greengenes
- Develop a command line script

Testing

- Software is complex and bugs can be sneaky
- Humans are error-prone, computers are stupid
- There are many types of testing
  - White box
  - Grey box
  - Black box
- There are many types of bugs
  - Arithmetic
  - Logic
  - Performance
- Publications based on untested code is dangerous



Can you spot the bugs?



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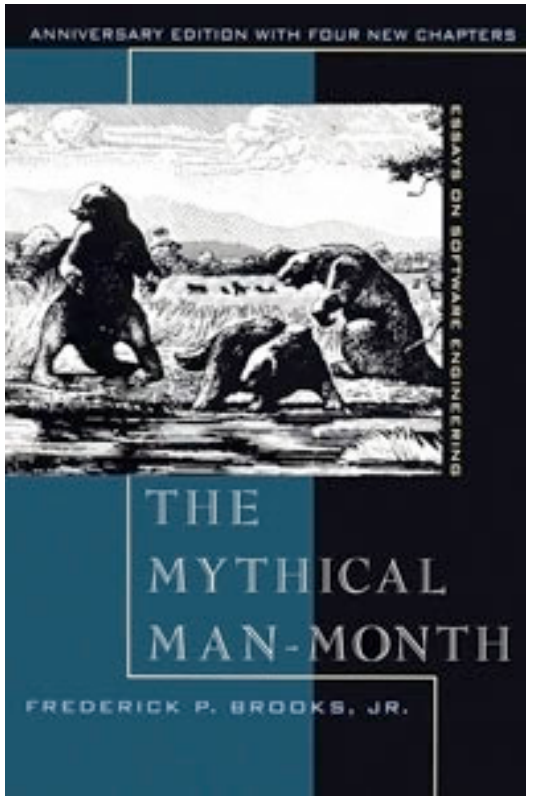

Testing Cont'd

- Unit-testing
  - A unit is a small well defined block of code
  - Tests verify the correctness of these blocks
  - Mocking is encouraged
- Integration testing
  - The whole is greater than the sum of the parts
  - Verify whole workflows
- Regression testing
  - Verify components as software evolves
  - Automated testing

- “Imperfect tests, run frequently, are much better than perfect tests that are never written at all.”
  - Martin Fowler (http://www.martinfowler.com/articles/continuousIntegration.html#N100F5)

PyCogent Scripting

- Use the PyCogent template script
- Add support for querying NCBI
- Write the sequences to a file
- Align the sequences and write to a file
- Reverse complement the alignment and write to a file
- Produce a consensus sequence for the alignment and print it to the screen
- Build a tree from the reverse complemented alignment and write it to a file