

Dynamic Languages - Übungen Blatt 1

Abgabedatum: April 2010, 23:59:59 Uhr

Aufgabe 0

(2 Punkte)

1. Install Python, `easy_install`, `mercurial` and `py.test`.
2. Make an account at `bitbucket.org`.
3. Build teams of two people and create one repository per team at `bitbucket`. Add the team members, `cfbolz` and `bivab` as writers.
4. Send David `david.schneider@uni-duesseldorf.de` an e-Mail with the names of the team members, the Matrikelnummern and `bitbucket` user names.

Aufgabe 1

(2 Punkte)

Write a function that counts the number of lines and the number of words in a file. A word is any non-empty sequence of characters between whitespace (as per the `split()` method of strings). The test function is given in `blatt1.py`.

Aufgabe 2

(2 Punkte)

1. The goal is to find a zero (in the mathematical sense) of some continuous function `f(x)` that takes and returns a real number (i.e. a float). To do that, write a function `find_zero(f, a, b)` that takes such a function `f` as argument, together with two floats `a` and `b` that give the bounds of the interval in which to search. The `find_zero` function should check that `f(a) < 0` and `f(b) > 0` (or the other way around), and divide the interval in half, and repeats until the zero has been found with sufficient precision (e.g. at least 0.0001). See the test in `blatt1.py`.
2. Use the function from 1. to implement `approximate_sqrt`. See the test in `blatt1.py`.
3. Write a function that takes an arithmetic expression as a string and turns it into a function, with one argument `x`, that can be used in part 1. See the test in `blatt1.py`. Hint: use the built-in `eval()` (type `help(eval)` in an interactive prompt).
4. Combine 1. and 3. in the obvious way.

Aufgabe 3

(2 Punkte)

Change the function `send(obj, message, *args)` from the lecture (in file `l2_class.py`) to behave differently when the message name is not found: instead of immediately raising an `AttributeError` exception, it should try to send to the same object a new message called `"message_not_understood"`. The first argument of this new message should be the original string from `message`. The remaining arguments should be `*args`, i.e. the arguments of the original message.

If the `"message_not_understood"` message is not found, then `send` should raise `AttributeError` as before.

Start from the test in `blatt1.py` but write more tests.

Aufgabe 4

(2 Punkte)

1. Implement the Burrows Wheeler transformation. Start from the test in `blatt1.py`.
2. Write your own test for the reverse transformation and implement it.

Reference: <http://de.wikipedia.org/wiki/Burrows-Wheeler-Transformation>

Please don't use the solution given on the English Wikipedia page (it is not very good).