Proposal

Zhicheng Fu

I will test a python library named “Equation” as my project. Equation is library for equation parser and evaluation system. It can be found at https://github.com/alphaomega-technology/Equation.

Instruction to install

Because this library maps some operators into numpy functions. So before we install this library, we need to install numpy firstly. After we have installed numpy library, here is the steps I install the library.

1. I use Ubuntu as operating system. The version of python is 2.7.6.

2. type “sudo su” in the terminal and type the password.

3. type “cd ~”

4. type “git clone https://github.com/alphaomega-technology/Equation”

5. type “cd Equation”

6. type “python setup.py install”

Description of the library

Equation library can convert a string to a python object. It indicates an equation corresponding to the input string. Then users can use the equation. For example, if we type fn = Expression("x+y^2",["y","x"]). Then the library will convert the input to the function: fn = (x+ y^2). And fn has two parameters x and y. And here we can print fn.

```
>>> print fn
\left(x + y^{2}\right)
```

Then we can pass value to the parameters of fn.

```
>>> fn(3, 4)
13
```

If we want to use (a + bj) which indicates imaginary number. But in this case, there should be a number before j. For example, if we want to input 1+j. Then we should type 1+1j.

What I will do to test the library

I will use TSTL to test the library. Firstly, I will test that if the string is an invalid string like “I am hungry.” Then set a function (x + y). Give value to x and y to test if there is any limitation on the number of x and y. For example, I will give some very big and very small negative and positive number. The library should allow them.

Also I will test, the name of the parameters. For example, I will give two same names for two parameters to see if the library can found the problem. What’s more, I will test if the parameter list has more parameters than those in expression to see what will happen with the library.

I will test imaginary number as the input to see if the library can deal with them correctly. And when I give value to every parameter, I will give more numbers of value passing to the function. Then I can see what the library will do on the extra value number.

All the testing above is only on one operator ‘+’. I will test on several operators to see if the library is correct on them. And for some specific functions like tan(), here is some value that is meaningless. The library should find out them. And for some math function like sin(), cos(). If I identify a parameter named as these function name. The library should forbidden these cases.

What’s more, the Equation library should be able to read a combination of multiple functions. And it should allow that parameters have very long names.