

Automatic Detection of Pseudo-tested Methods using Python and Pytest

Nicholas Tocci
Gregory Kapfhammer

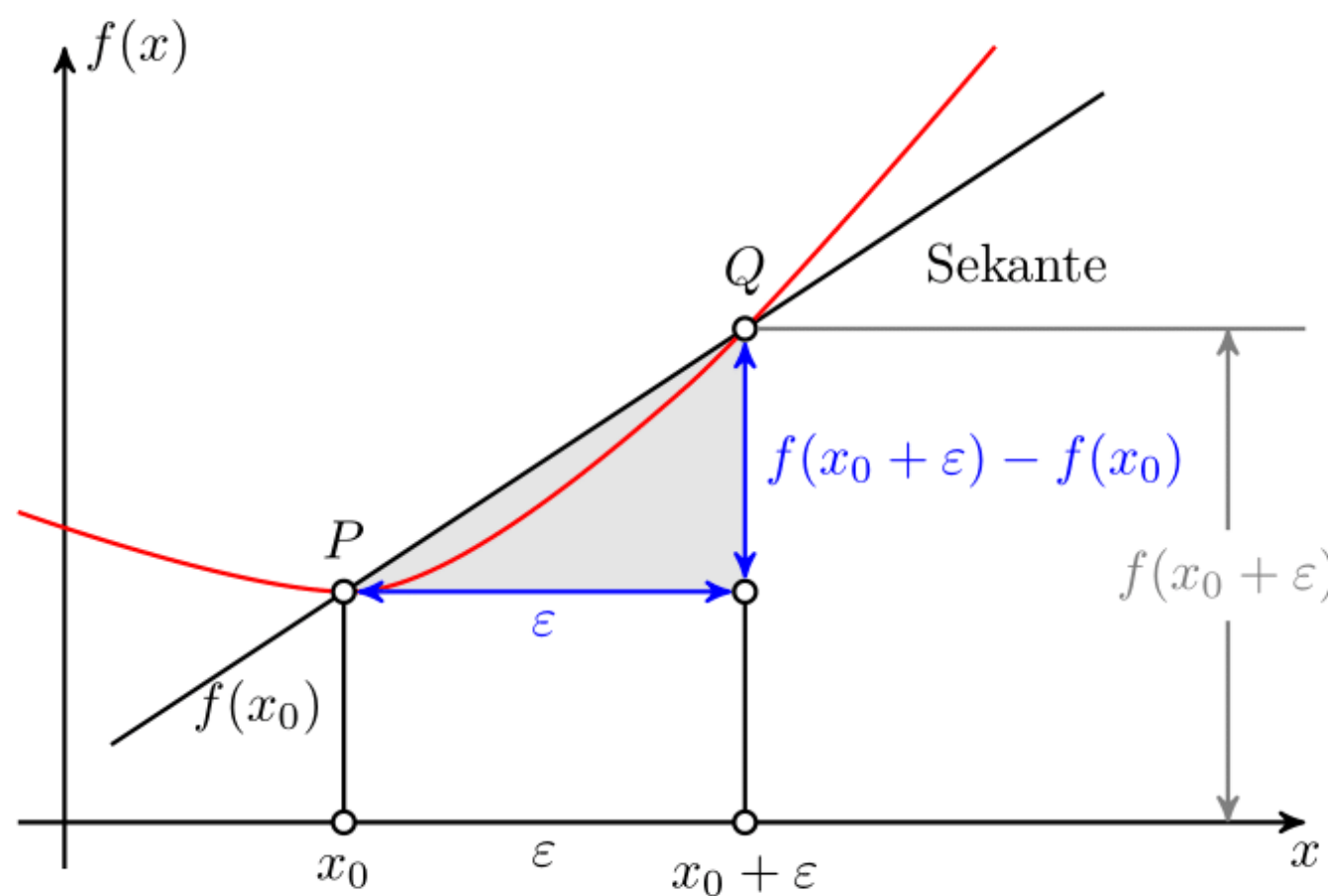
Introduction

Here is an itemised list:

- The first item.
- The second item.
- The third item.

A Diagram

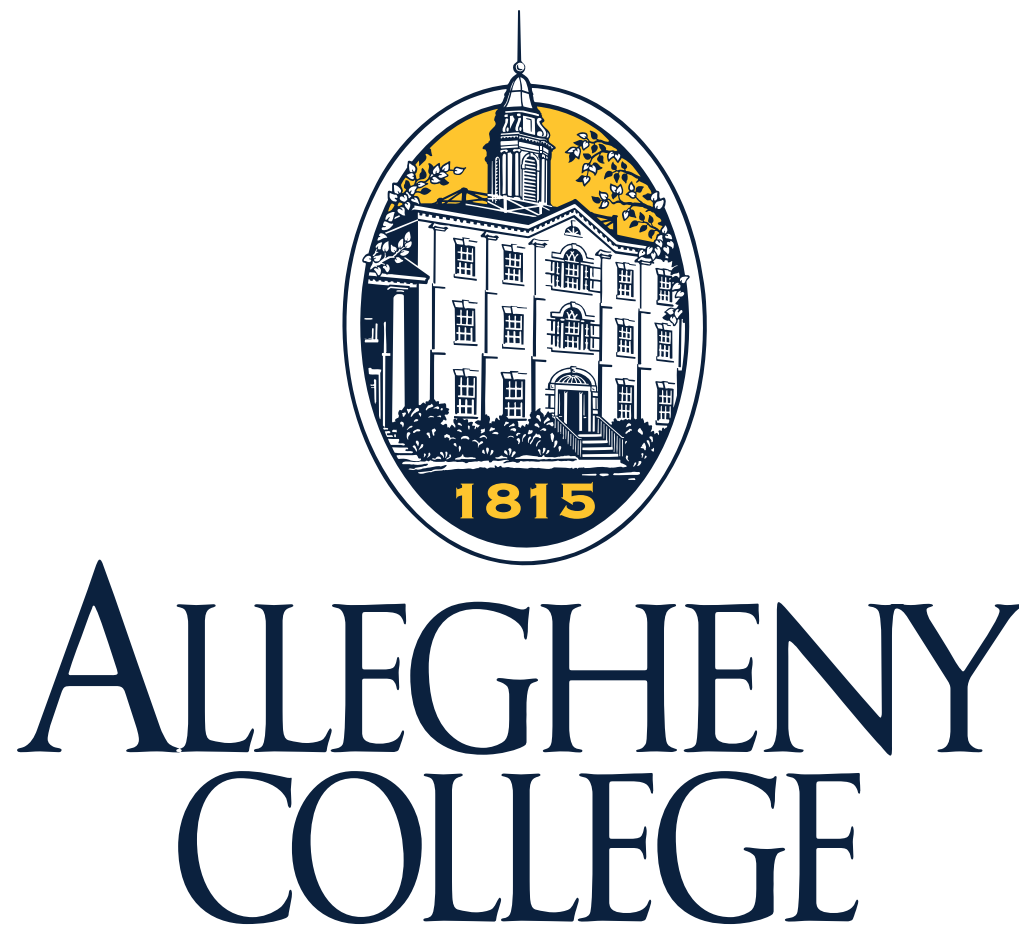
Here is a diagram:



Fundamental Theorem of Calculus

If f is continuous on the closed interval $[a, b]$ and F is the indefinite integral of f on $[a, b]$, then

$$\int_a^b f(x) dx = F(b) - F(a). \quad (1)$$



Function-Fiasco, an automatic detection tool, uncovers pseudo-tested methods in Python based systems.

Results

| System name | State_Cov | Function_Cov | NUMM | NUMTM | Fiascoed | Pseudo | NUMTM | UC | Change |
|-------------------|-----------|--------------|------|-------|----------|--------|-------|------|--------|
| 1. Haskell-Python | 0.97 | 0.94 | 16 | 15 | 10 | 8 | 7 | 0.44 | 0.50 |
| 2. Bleach | 0.48 | 0.41 | 348 | 152 | 8 | 2 | 150 | 0.41 | 0.00 |
| 3. Pycco | 0.77 | 0.86 | 22 | 19 | 6 | 5 | 14 | 0.64 | 0.22 |
| 4. Howdoi | 0.78 | 0.95 | 20 | 19 | 2 | 0 | 19 | 0.95 | 0.00 |
| 5. Flashtext | 0.81 | 0.33 | 42 | 14 | 7 | 4 | 10 | 0.24 | 0.09 |
| 6. Honcho | 0.85 | 0.69 | 38 | 40 | 7 | 5 | 35 | 0.60 | 0.09 |
| 7. Mape | 0.90 | 0.50 | 88 | 44 | 13 | 3 | 41 | 0.67 | 0.03 |
| 8. Gator | 0.99 | 0.86 | 92 | 79 | 54 | 30 | 49 | 0.53 | 0.33 |
| 9. Hatch | 1.00 | 0.56 | 124 | 75 | 14 | 6 | 69 | 0.51 | 0.05 |
| 10. Nikola | 0.67 | 0.44 | 732 | 319 | 16 | 9 | 310 | 0.42 | 0.02 |

Table 1: List of results of experimentation.

Function-Fiasco can successfully detect pseudo-tested methods in Python based systems.

Future Work

Function-Fiasco has many features that will be implemented which include:

- Further type fuzzing capability
- Parameterized test observation
- Further system evaluation

Conclusion

Pseudo-tested methods are an issue that exist in Python based systems. Function-Fiasco has the capability to detect such methods that may lead to unexpected issues.

Get Involved

If you would like to get involved, please feel free to enter bugs into the issue tracker on our github page, or submit a pull request to aid in the implementation.



Take a picture to
download the full paper

ALLEGHENY COLLEGE
COMPUTER SCIENCE