Automatic Detection of Pseudo-tested Methods using Python and Pytest

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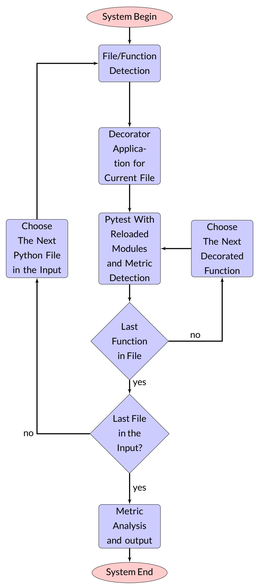
Introduction

Software systems are very large and complex. Due to this, modern python programs are difficult to test due to the lack of type safety. Another concern is the possible misleading nature of statement coverage since it doesn't factor in branches and iteration, there is no information on the data state, and the quality of the oracle. Due to this, there is a potential chance for psuedo-tested methods to exist in python programs.



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Function-Fiasco is an automatic tool that detects pseudo-tested methods in Python progams.

Take a picture to download the full paper

Results

	System_name	State_Cov	Function_cov	NUMM	NUMTM	Fiascoed	Pseudo	NUMTTM	UC	Change
1	Hashids-Python	0.97	0.94	16	15	10	8	7	0.44	0.50
2	Bleach	0.48	0.41	368	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	58	40	7	5	35	0.60	0.09
7	Maya	0.90	0.50	88	44	13	3	41	0.47	0.03
8	Gator	0.99	0.86	92	79	54	30	49	0.53	0.33
9	Hatch	1.00	0.56	134	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.

Made in cooperation with Cory Wiard.

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