

Software Testing, Quality Assurance & Maintenance—Lecture 24*

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Part I

Using Linters

source: `jamie-wong.com/2015/02/02/linters-as-invariants/`

First there was C

Statically-typed languages like C:

```
#include <stdio.h>
```

```
int main() {  
    printf("%d\n", num);  
    return 0;  
}
```

Compiler saves you from yourself.

Guaranteed invariant:

“if code compiles, all symbols resolve”.

Less-nice languages

OK, so you try to run that in JavaScript and it crashes right away.

Invariant:

“if code runs, all symbols resolve”?

Counterexample

But what about this:

```
function main(x) {  
  if (x) {  
    console.log("Yay");  
  } else {  
    console.log(num);  
  }  
}
```

```
main(true);
```

Nope!

Still no invariants

Invariant:

“if code runs without crashing, all symbols referenced in the code path executed resolve”?

Nope

```
function main() {  
  try {  
    console.log(num);  
  } catch (err) {  
    console.log("nothing to see here");  
  }  
}  
  
main();
```

JavaScriptWorld Problems

When maintaining old code:

- is this variable defined?
- is this variable always defined?
- do I need to load a script to define that variable?

Why is this the developer's problem?

Solution: Linters

```
plam@banach ~> cat foo.js
```

```
function main(x) {  
  if (x) {  
    console.log("Yay");  
  } else {  
    console.log(num);  
  }  
}
```

```
main(true);
```

```
plam@banach ~> nodejs /usr/local/lib/node_modules/  
  jshint/bin/jshint --config jshintrc foo.js  
foo.js: line 5, col 17, 'num' is not defined.
```

```
1 error
```

Invariant

“If code passes JSHint, all top-level symbols resolve.”

Strengthening the Invariant

Add a pre-commit hook.

“If code is checked-in and commit hook ran,
all top-level symbols resolve.”

Better yet...

Block deploys on test failures.

“If code is deployed,
all top-level symbols resolve.”

Even better yet...

Hard to tell if code is deployed or not.

Use git feature branches, merge when deployed.

“If code is in master,
all top-level symbols resolve.”