> ProCode( );

rating source code quality

student professional

Richard Beal

INSIGHT

“We ***all*** write source code.”

“Let’s write ***professional***-quality source code!”

Framework

Language: C

Code:

```
// ...
float i;
int j = 8;
i = j * 2.1;
// ...
```

Framework


```
> ProCode( );
```

Language: C

Code:

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// ...
float i;
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Syntax Tokenization: *S*

FLOAT ID3 SEMI
INT ID4 EQ D4 SEMI
ID3 EQ ID4 MULT F7 SEMI

Framework

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Syntax Tokenization: *S*

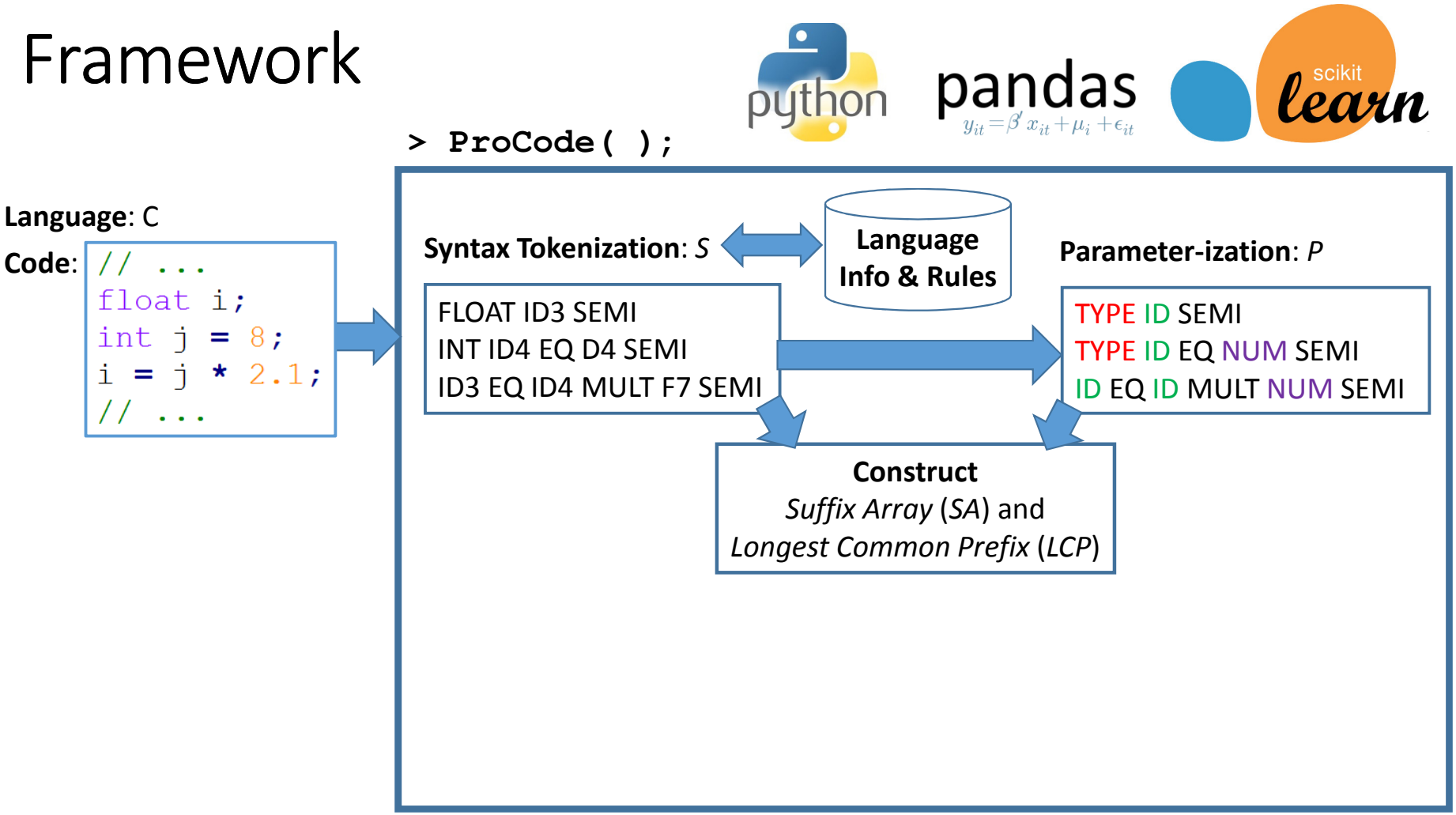
Language Info & Rules

```
FLOAT ID3 SEMI
INT ID4 EQ D4 SEMI
ID3 EQ ID4 MULT F7 SEMI
```

Parameter-ization: *P*

```
TYPE ID SEMI
TYPE ID EQ NUM SEMI
ID EQ ID MULT NUM SEMI
```

Framework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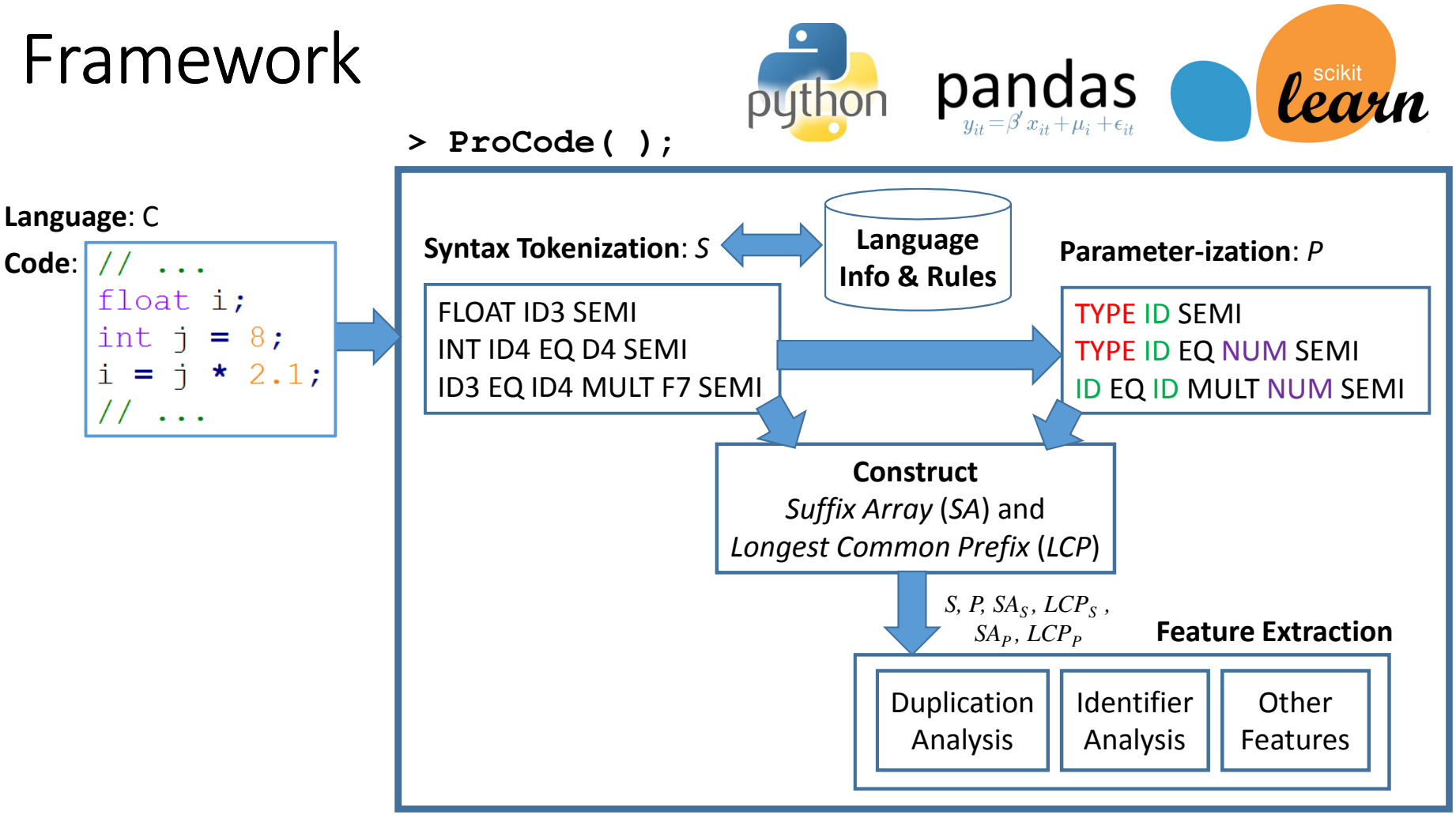
Construct
Suffix Array (SA) and
Longest Common Prefix (LCP)

Framework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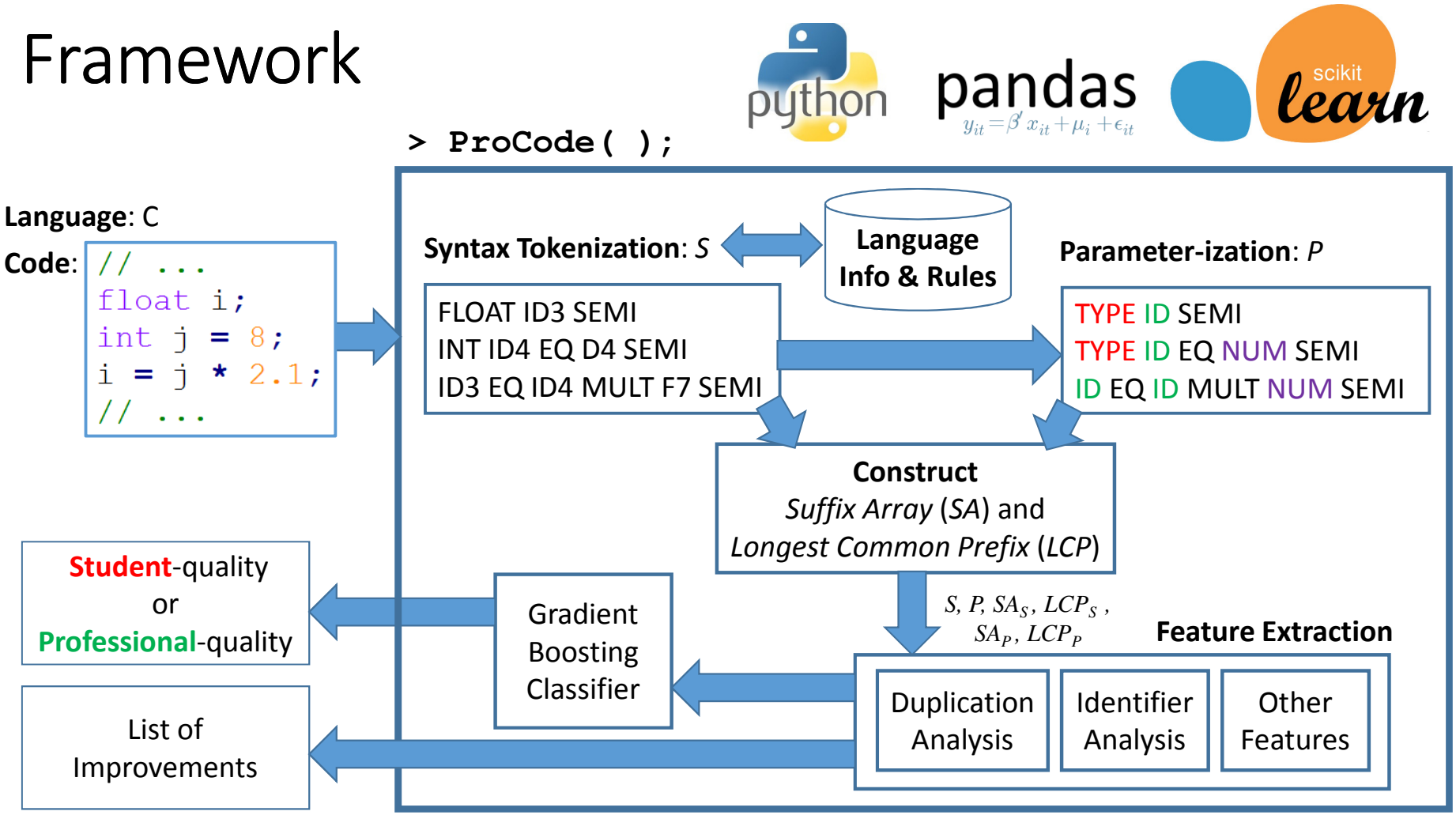
Construct
Suffix Array (SA) and
Longest Common Prefix (LCP)
S, P, SA_S, LCP_S , SA_P, LCP_P
Feature Extraction
Duplication Analysis
Identifier Analysis
Other Features

Framework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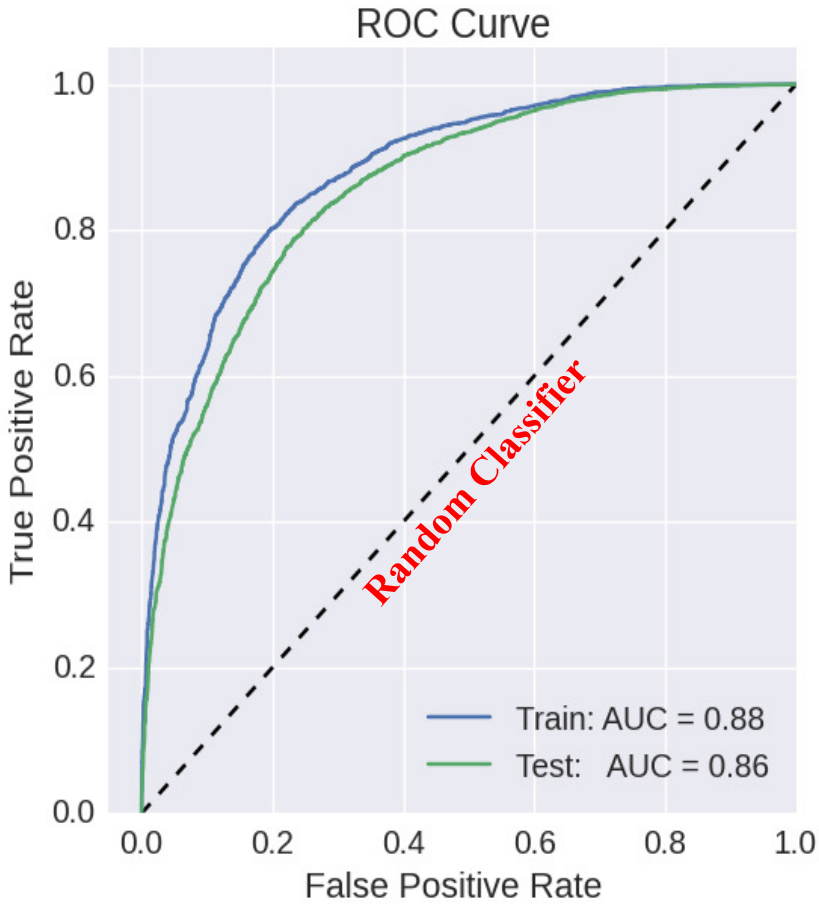
Feature Extraction
Duplication Analysis
Identifier Analysis
Other Features
Gradient Boosting Classifier
Student-quality or Professional-quality
List of Improvements

Performance

- Achieved **86%** AUC on labeled C-code from **GitHub**
  - "Professional" = Top-rated repository
  - "Student" = Academic repository
- Classifier uses "good habit" features
  - **Creative** variable names

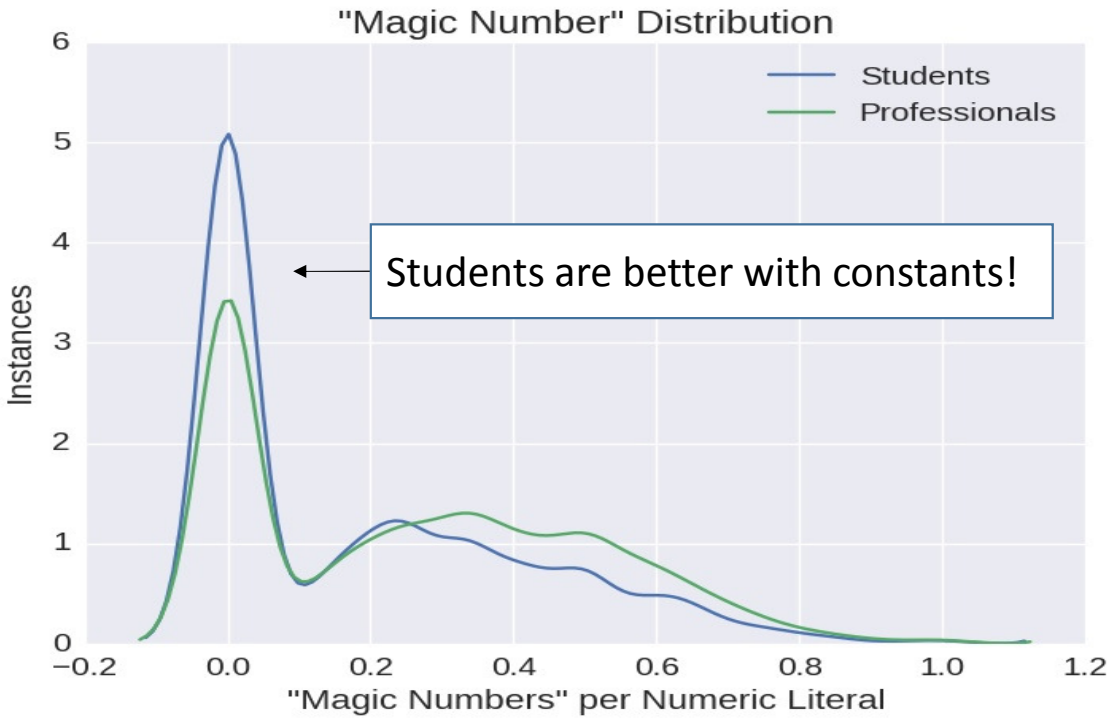
    `x` vs. `textLen`
  - **Limited redundancy**, pros write functions!

    `x+y*x-z` $=_p$ `a+b*a-c`
  - …



Data Story

Everybody needs `> ProCode( );`



NumPy : datetime.c

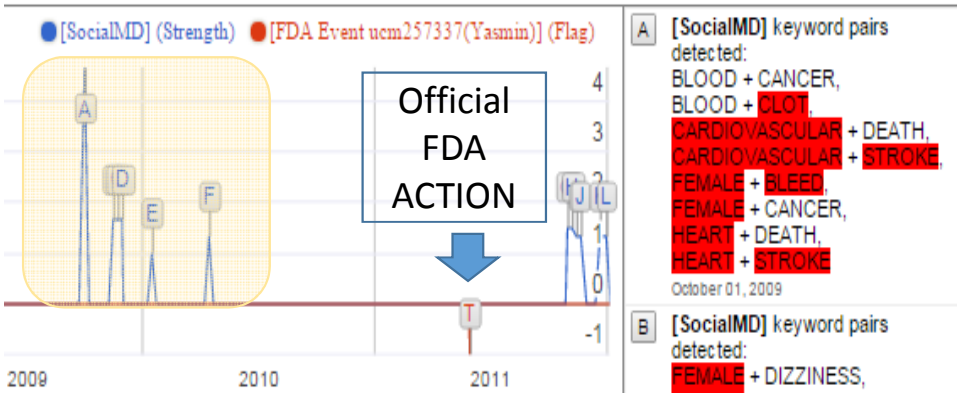
```
case NPY_FR_ms:
    ret = (((days * 24 +
            dts->hour) * 60 +
            dts->min) * 60 +
            dts->sec) * 1000 +
            dts->us / 1000;
    break;
```

Hard-Coded #s	Frequency
60	108
1000	45
1000000	38
24	36
2	29
…	…

Richard Beal

PhD Computer Science

Drug Adverse Reaction Detection



Parameterized Pattern Matching