

Conflerge: Automating merge conflict resolution

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The Problem

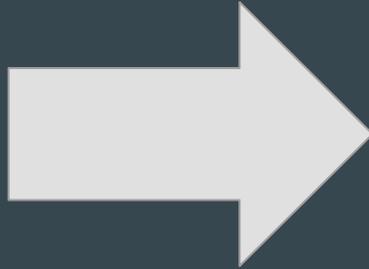
- Clear drawbacks to **line-based** conflict detection
 - Manual labor is gross
 - Imprecise; False-positives
 - Goes against intuition
- Ask: why do we care about code comparison?
 - **Semantic** concerns, **structural** components

```
Book book = new Book(  
    String title  
);  
  
Book book = new Book(String title);
```

Let's approach merging and conflict resolution in a more idiomatic way.

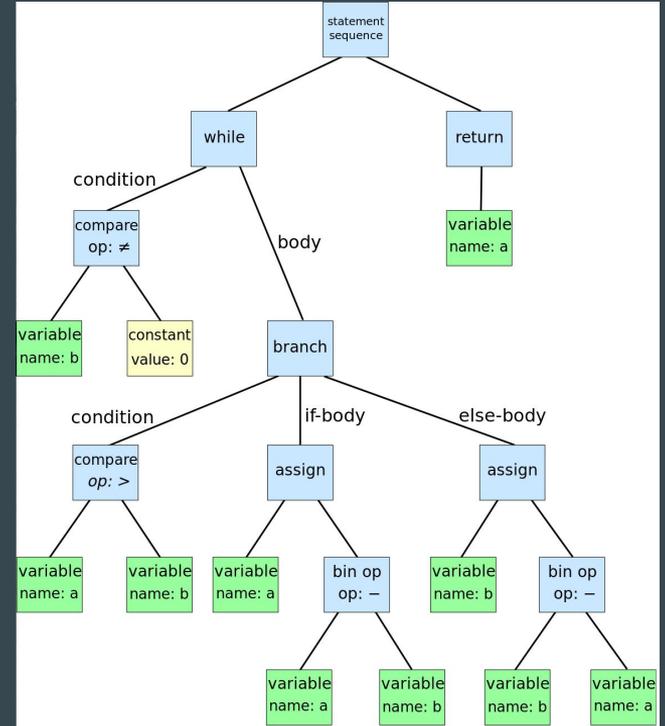
Solution: Abstract Syntax Trees

```
while b ≠ 0
  if a > b
    a := a - b
  else
    b := b - a
return a
```



Ignore whitespace, punctuation and delimiters

Compare trees of conflicting HEADS



Challenges

- Sensible method for merging ASTs
- Giving developer feedback
 - Resolution summary
 - Can override resolutions
- Language agnostic
 - Leverage existing code to construct abstract syntax trees
 - Focus on the analysis and resolving conflicts
- Performance
 - **Line-based** is efficient, but manual
 - Can **tree merging** compete?