Code Smells:

Sniffing out Poorly Written Code

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About the Session Author

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What's in it for me?

You'll learn:

- What a code smell is
- What the most common code smells are
- Why code smells happen
- The good news about code smells
- Why you should be concerned about code smells
- What you can do when you encounter a code smell
- Tools to help eradicate code smells

What is a code smell?

Definition

Code Smell – A **symptom** in the source code that **possibly** indicates a deeper problem

Common Code Smells

- Poor naming
- Overly complicated
- Contrived complexity
- Too many modules
- Duplicate logic
- Disorganization
- Breaks dataflow
- Outdated practices
- Too many parameters
- Excessive use of literals
- Cyclomatic complexity
- Others???

Why do code smells happen?

- Time constraints
  - We are pressured to look for the **quickest** implementation instead of the **best** implementation
  - “If it runs, it’s done.”
- Start coding without requirements
- Cut/Paste/Rename
  - Easy and fast ‘reuse’
- Development team size
- No ownership of code

There is good news, though…

A code smell:

- Is **not** a Bug
- Is **not** technically incorrect
- **Does not** currently prevent the code from functioning

If these statements are true, then why should we be concerned?

Why be concerned?

- Code smells:
  - Make code less
    - Readable
    - Maintainable
    - Scalable
  - Affect all phases of the software lifecycle
    - Development
    - Support
    - Troubleshooting
    - Modification
    - Maintenance
  - May lead to bugs

What can we do?

- Be vigilant – Code smells are all around us
  - We just have to look for them
  - Can be in **any** code (LabVIEW VIs, TestStand sequences)
- Don’t look the other way when you discover a code smell
  - Take the initiative and time to **refactor** the code
    - If you don’t, who will?

Refactoring

Definition

Refactoring – The process of redesigning software to make it more readable and maintainable so that the cost of change does not increase over time

When to Refactor

- When you are adding features to or debugging your source code

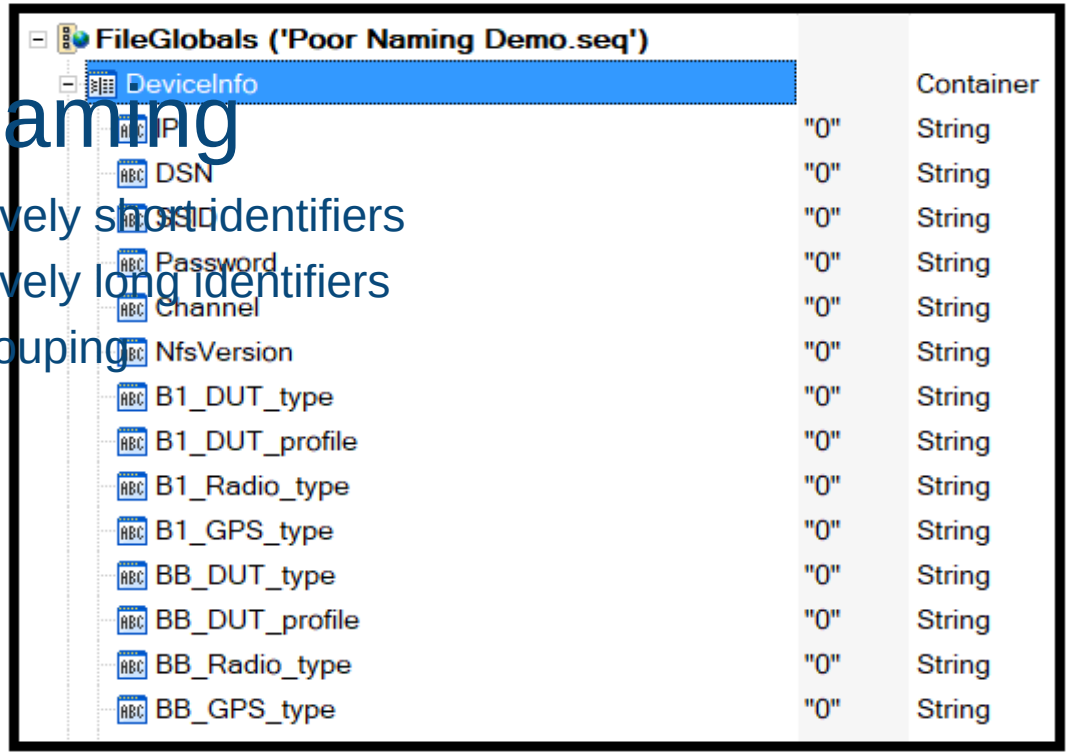
Demonstrations

Code From The Real World
(You can’t make this stuff up!)

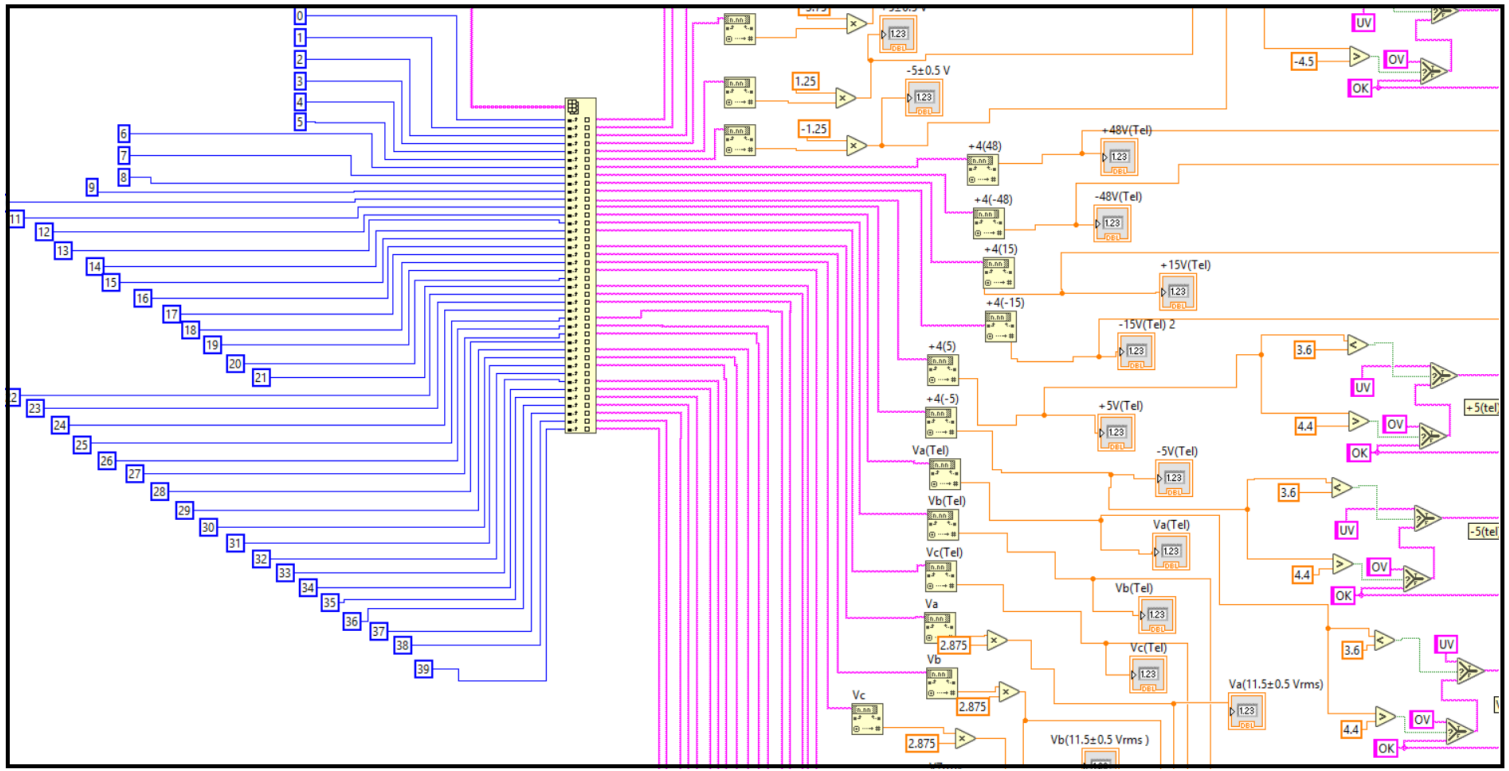
Demonstration

Poor Naming

- Excessively short identifiers
- Excessively long identifiers
- Poor grouping



Demonstration



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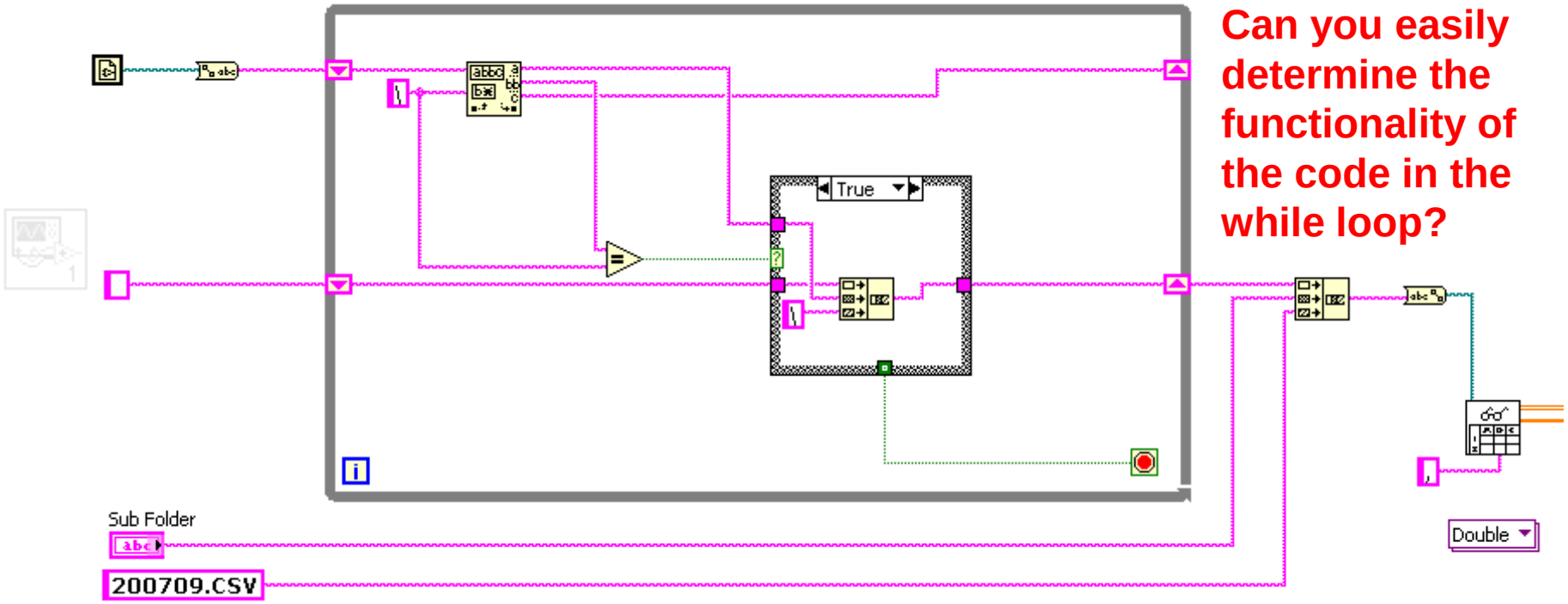
Demonstration



Can you easily determine the functionality of the code in the while loop?

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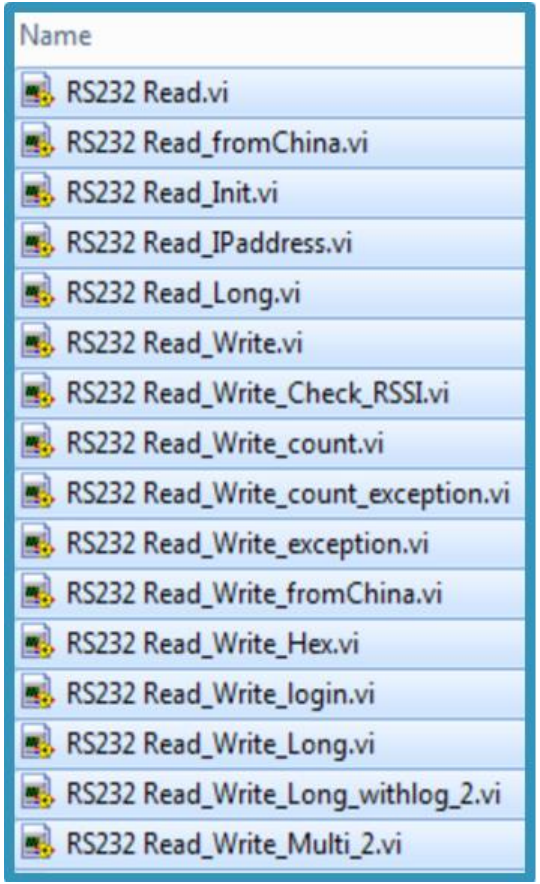
Demonstration

Too Many Modules



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Demonstration

Evolut

VI Name	Total Terminals	Connected Terminals
RS232 Read_Write_Multi_withlog_count_exception.vi	16	14
RS232 Read_Write_Multi_withlog_2.vi	16	13
RS232 Read_Write_Multi_count_exception.vi	16	13
RS232 Read_Write_Multi_count.vi	16	13
RS232 Read_Write_Multi_2.vi	16	12
RS232 Read_Write_Reboot_withlog_count.vi	12	9
RS232 Read_ZigBee.vi	12	8
RS232 Read_Write_withlog_exception.vi	12	8
RS232 Read_Write_withlog_count_exception.vi	12	8
RS232 Read_Write_withlog_count.vi	12	8
RS232 Read_Write_withlog_2_froChina.vi	12	8
RS232 Read_Write_withlog_2.vi	12	8
RS232 Read_Write_Reboot_withlog_2.vi	12	8
RS232 Read_Write_Reboot_withlog.vi	12	8
RS232 Read_Write_Reboot_count_exception.vi	12	8
RS232 Read_Write_Reboot_count.vi	12	8
RS232 Read_Write_Long_withlog_2.vi	12	8
RS232 Read_Write_count_exception.vi	12	8
RS232 Read_Write_count.vi	12	8
RS232 Read_Write_withlog.vi	12	7

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Demonstration

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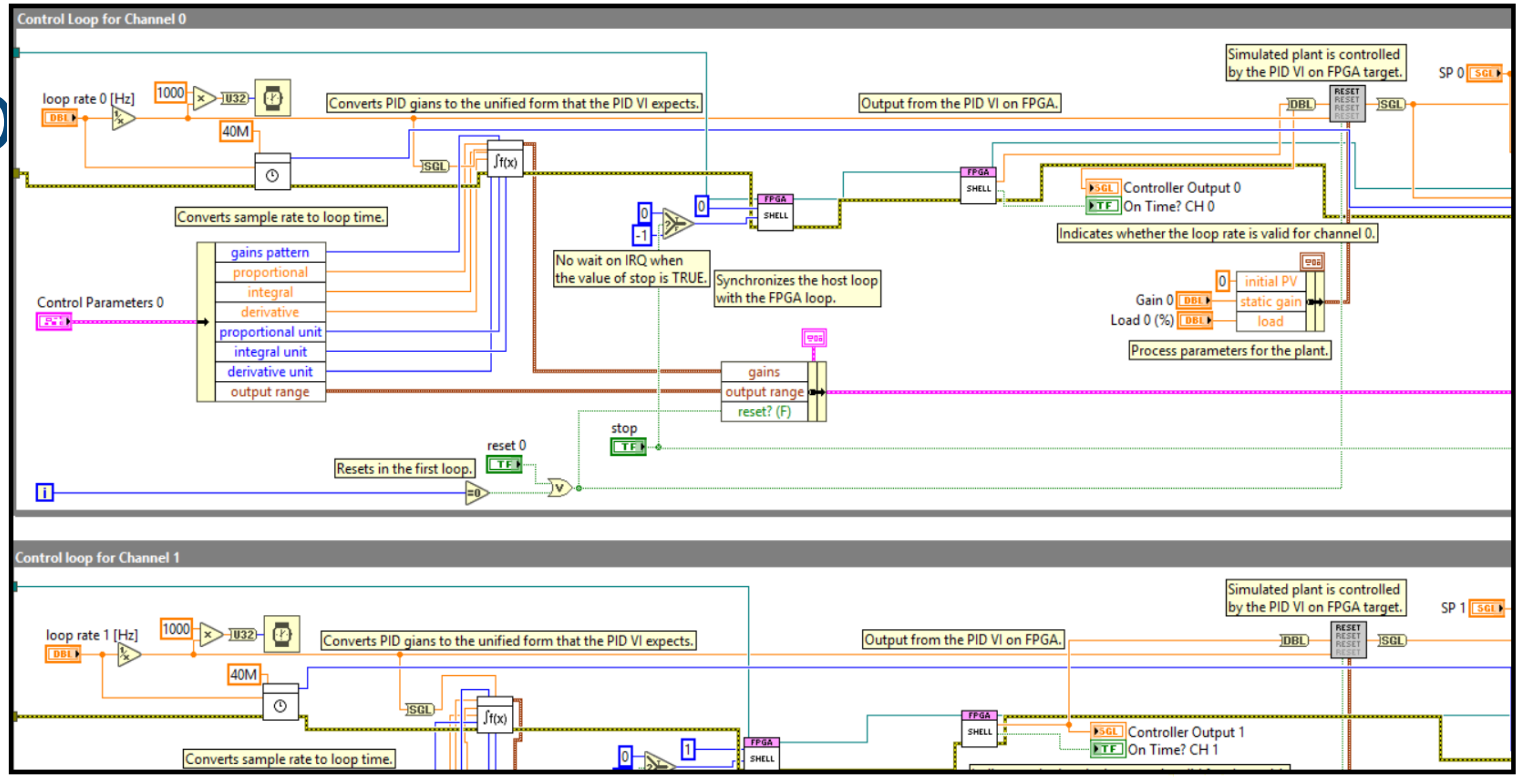

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Demonstration

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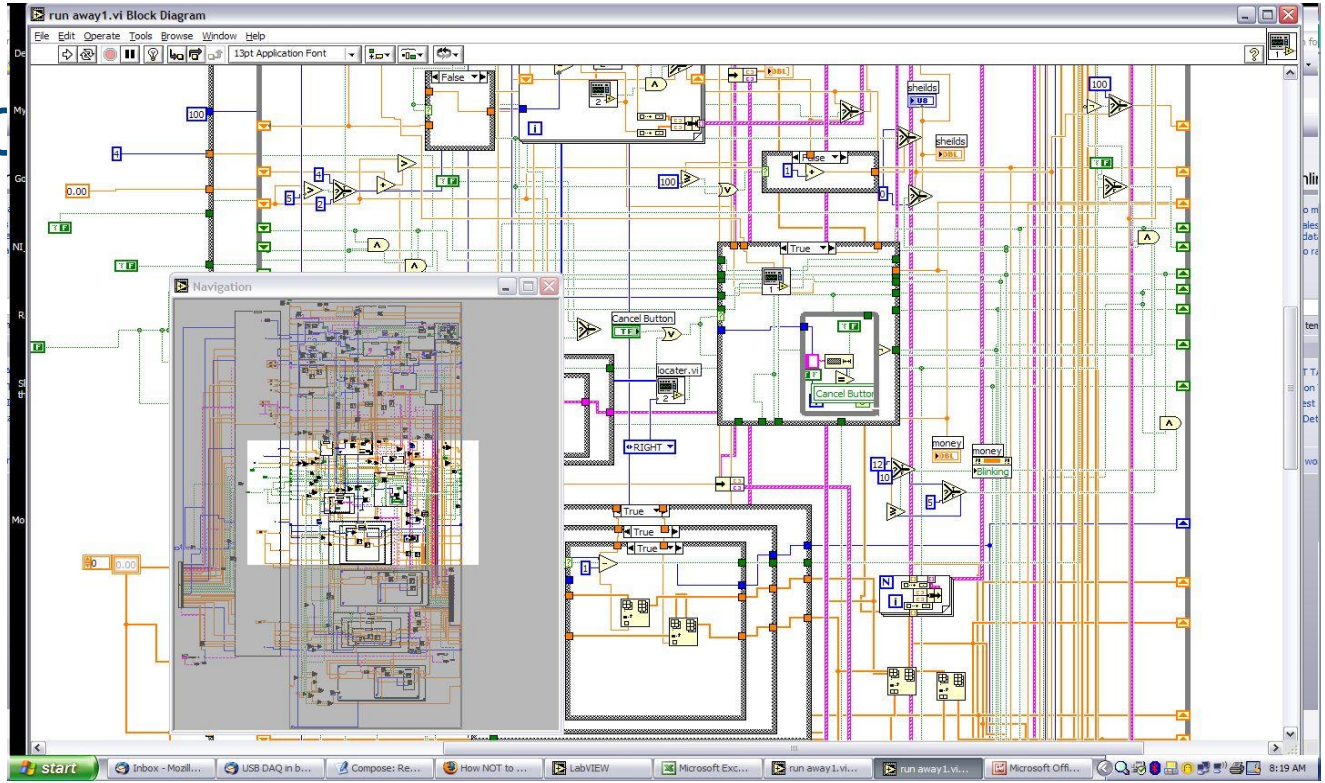

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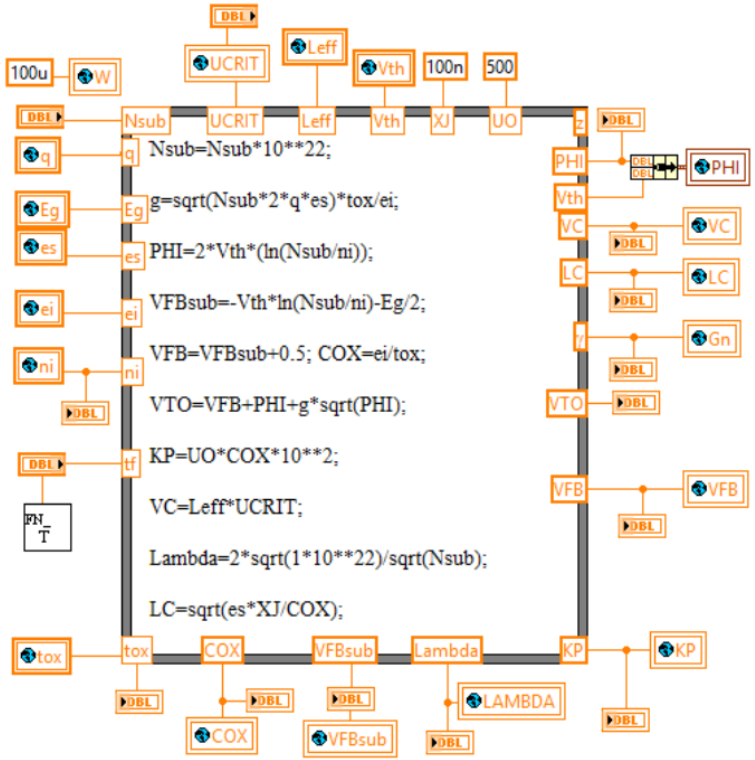
Demonstration

Breaks Da



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Demonstration

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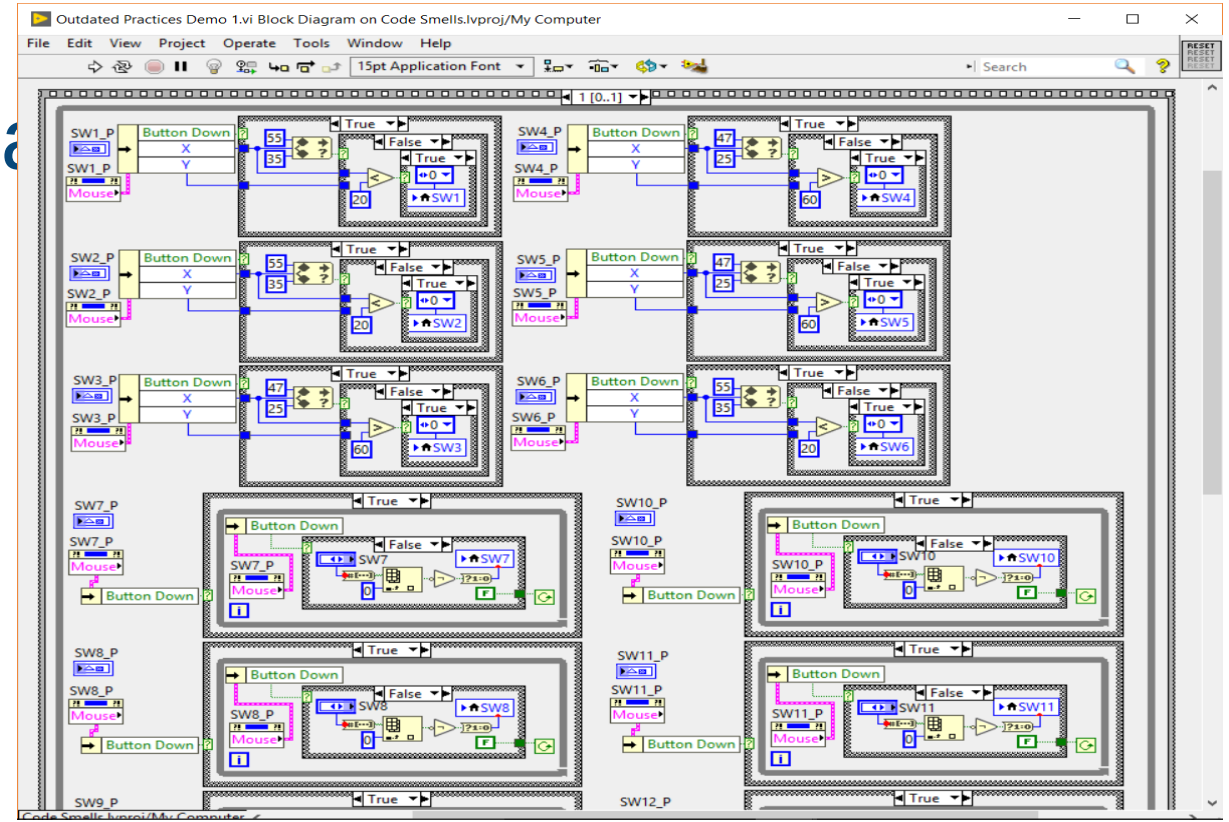

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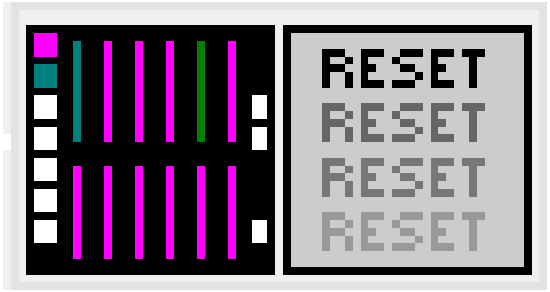
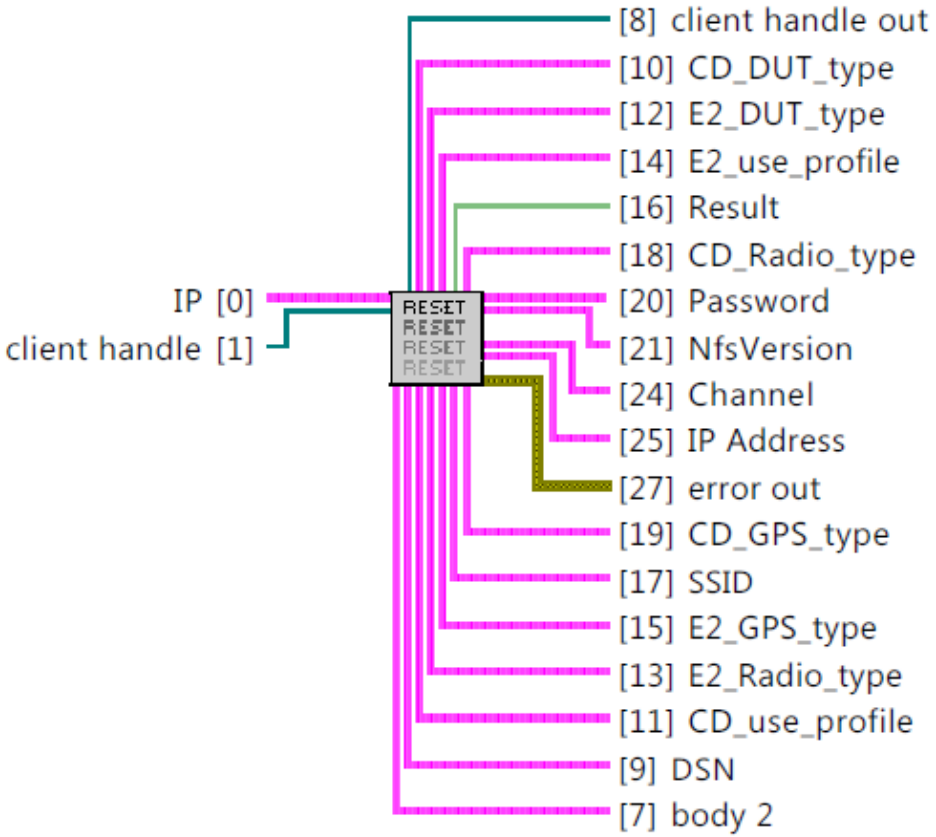
Demonstration

Too Many Parame





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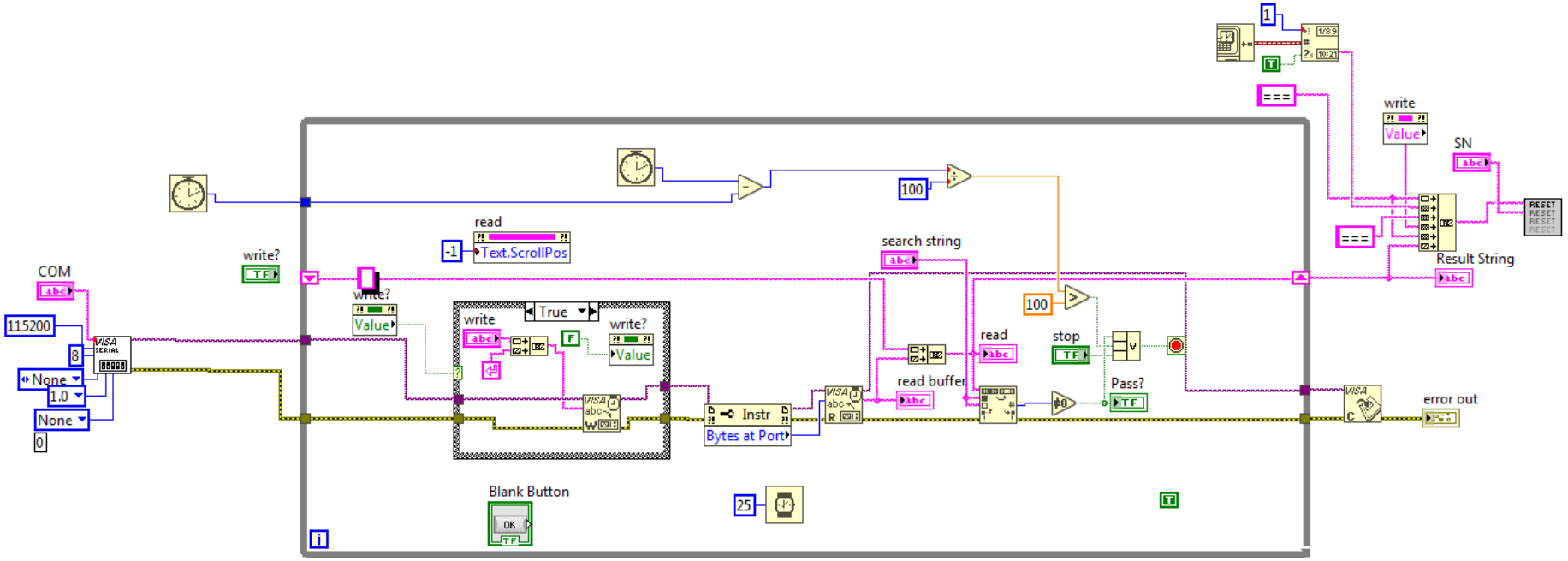

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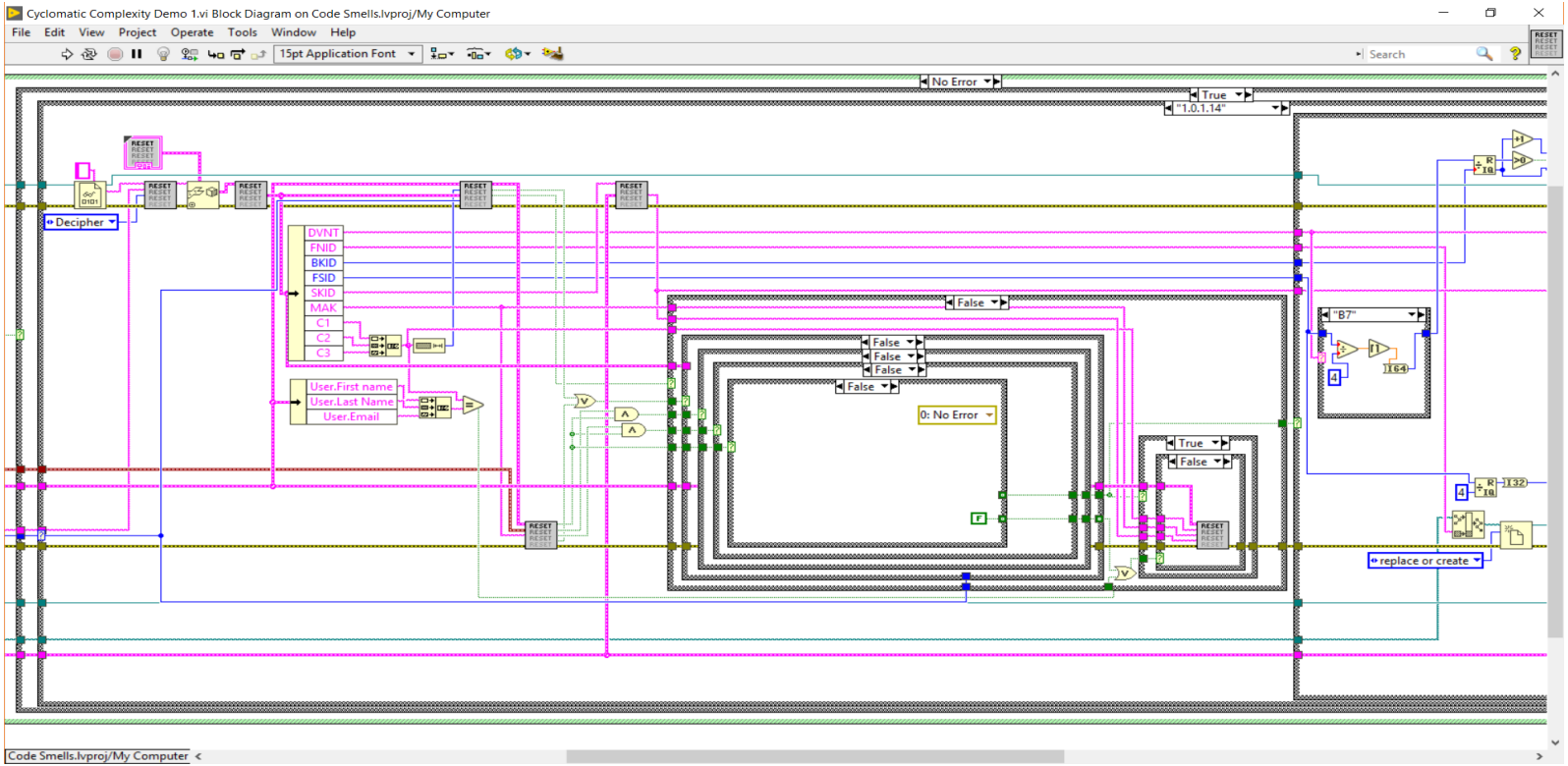

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Tools to Help Eradicate Code Smells

- LabVIEW: VI Analyzer
  - Tools >> VI Analyzer >> Analyze VIs…
- TestStand: Sequence Analyzer
  - Debug >> Sequence Analyzer >> Analyze <Sequence Name>

Topics Covered

- Poor naming
- Overly complicated
- Contrived complexity
- Too many modules
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- Cyclomatic complexity
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Next Steps

- Learn more about detecting and correcting smelly code
  - LabVIEW Help
    - On the Index tab, type “VI Analyzer” into the keywords to find field, then double-click the “VI Analyzer” topic and click the link to open the LabVIEW VI Analyzer Toolkit User Guide.
  - TestStand Help
    - On the Index tab, type “Sequence Analyzer” into the keywords to find field, then double-click the “analyzing sequence file” topic.

Questions / Comments

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Thank You!

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