SoneFi_AMM_Swap_Analysis_Secure3

Source From Secure3:
https://github.com/WELabsPerpCodeBase/WELabs_AMM_Swap_Audit#code-repos

Purpose

The primary objective of this analysis is to assess the code similarity between the source repo and the target repo.

Our engineering team has embarked on a detailed direct comparison of the code repositories. This examination aims to accurately quantify and understand the extent of similarity.

Our analysis result can be found in the conclusion.

Code Repos

Source

- https://github.com/WELabsPerpCodeBase/AMM-Swap
    - commit hash: `34b4a88546cb53ea40f1f2d8e56790e4de7a775d`
        - router.sol
        - factory.sol

Target

- https://etherscan.io/address/0x7a250d5630b4cf539739df2c5dacb4c659f2488d#code
    - `0x7a250d5630b4cf539739df2c5dacb4c659f2488d`
- https://etherscan.io/address/0x074b735db7a27cf0d68f0eba6769b4c751cfc23d#code
    - `0x074b735db7a27cf0d68f0eba6769b4c751cfc23d`

A copy of the codes has also been cloned into source_code/ and target_code/ for reference.

Conclusion

Based on our comparison, we conclude that the source and the target are: Nearly Identical with a new contract added `WELabAMMSwapFactory`.

The majority of changes are:

1. Function renames
2. Variable renames
3. Fee change
4. New contract WELabAMMSwapFactory - the added code has been extract to a file in results/WELabAMMSwapFactory.sol

With proper execution, the WELabs_AMM_Swap protocol should perform in very similar ways to Uniswap V2. Prior security assessments on target repos can be a good reference. Readers of this analysis, based on your security requirements, should determine on their own whether or not to directly trust the prior or existing security assessments or audits on target repos.

Methodology for Similarity Comparison

In our approach, we primarily employed the fundamental algorithm underlying the `diff` utility to ascertain the degree of similarity at the string level between the source and target repos.

The `diff` utility, widely used in text comparison and analysis, operates on the principle of finding the longest common subsequence (LCS) between two sets of data, typically text files:

1. Longest Common Subsequence (LCS): The LCS is the heart of the diff algorithm. It finds the longest sequence of characters that appear in the same order in both files. Unlike substrings, the characters in a subsequence are not required to occupy consecutive positions. The LCS serves as a baseline for understanding the similarities between two files.
2. Differences Identification: After determining the LCS, diff analyzes the sections of the files that don't form part of this subsequence. These segments are the differences or changes. The algorithm efficiently pinpoints where the two files diverge from the LCS, marking these as either additions, deletions, or modifications.

The screenshots are from Beyond Compare for better visualization.

Tools used:

- `diff` - https://ss64.com/osx/diff.html
- DiffMerge: https://sourcegear.com/diffmerge/
- Beyond Compare: https://www.scootersoftware.com/

Comparison Detail

Diff Compare -> factory.sol

- Diff:
  - source_code/AMM-Swap/contracts/core/factory.sol
  - target_code/uniswap-v2/UniswapV2Pair.sol
- Output: ./results/AMM-Swap/contracts/core/factory.sol.patch

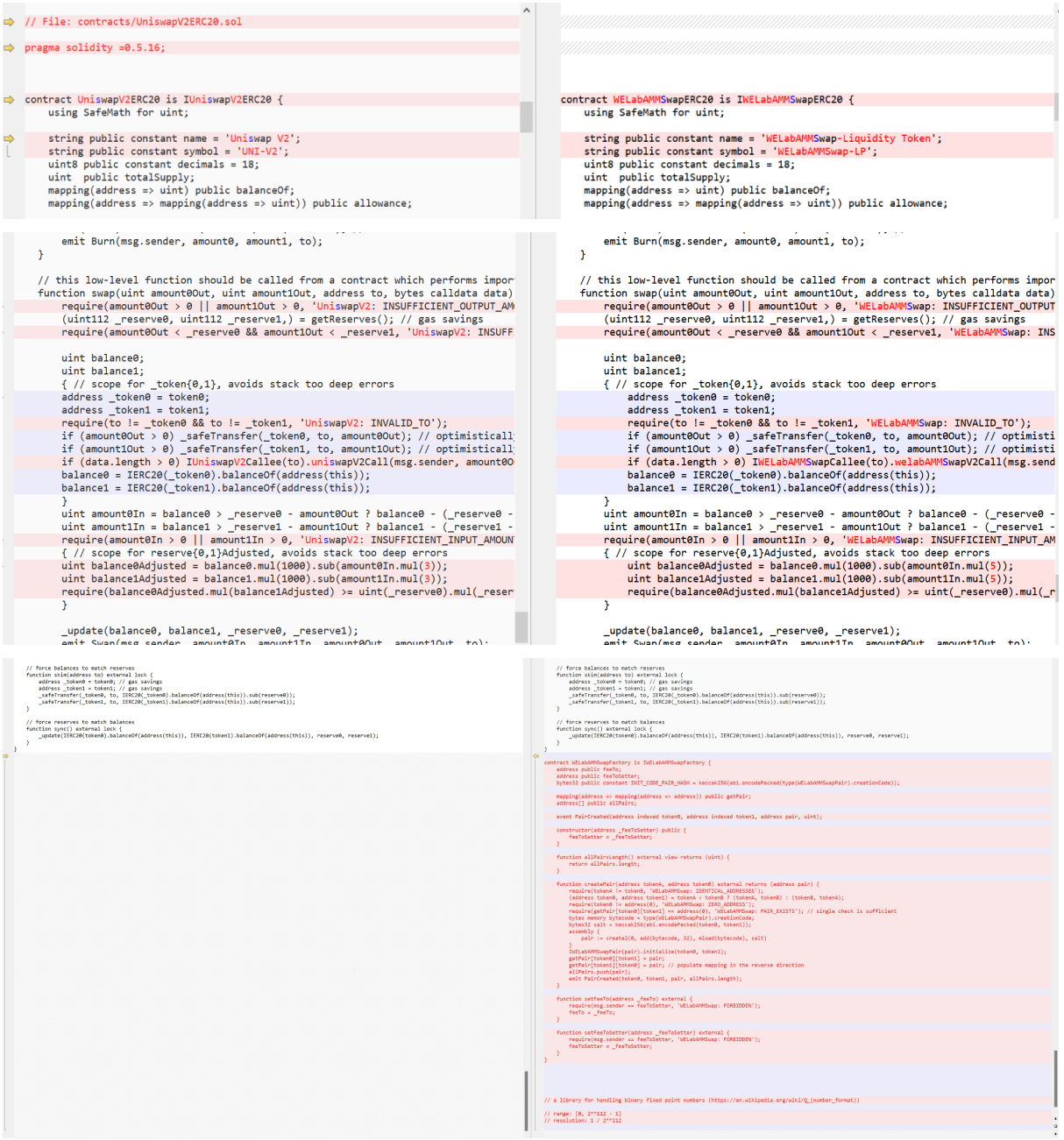
```
$ diff ./source_code/AMM-Swap/contracts/core/factory.sol
./target_code/uniswap-v2/UniswapV2Pair.sol >
./results/AMM-Swap/contracts/core/factory.sol.diff.patch
```

Main changes:

1. file renames
2. variable and function renames
3. add a contract WELabAMMSwapFactory with 38 newlines.

Screenshot from Beyond Compare for Reference:

- ./source_code/AMM-Swap/contracts/core/factory.sol
  TIPS: The result has already made several contracts in factory.sol change their locations.



cloc compare

```
$ cloc --by-file --diff source_code/AMM-Swap/contracts/core/factory.sol
target_code/uniswap-v2/UniswapV2Pair.sol --include-ext=sol
```

1 text file.
1 text file.

github.com/AlDanial/cloc v 1.90 T=0.07 s (53.7 files/s, 5946.5 lines/s)

File	blank	comment	code
source_code/AMM-Swap/contracts/core/factory.sol			

same	0	15	324
modified	0	3	35
added	6	10	9
removed	0	3	38

SUM:

same	0	15	324
modified	0	3	35
added	6	10	9
removed	0	3	38

Diff Compare -> router.sol

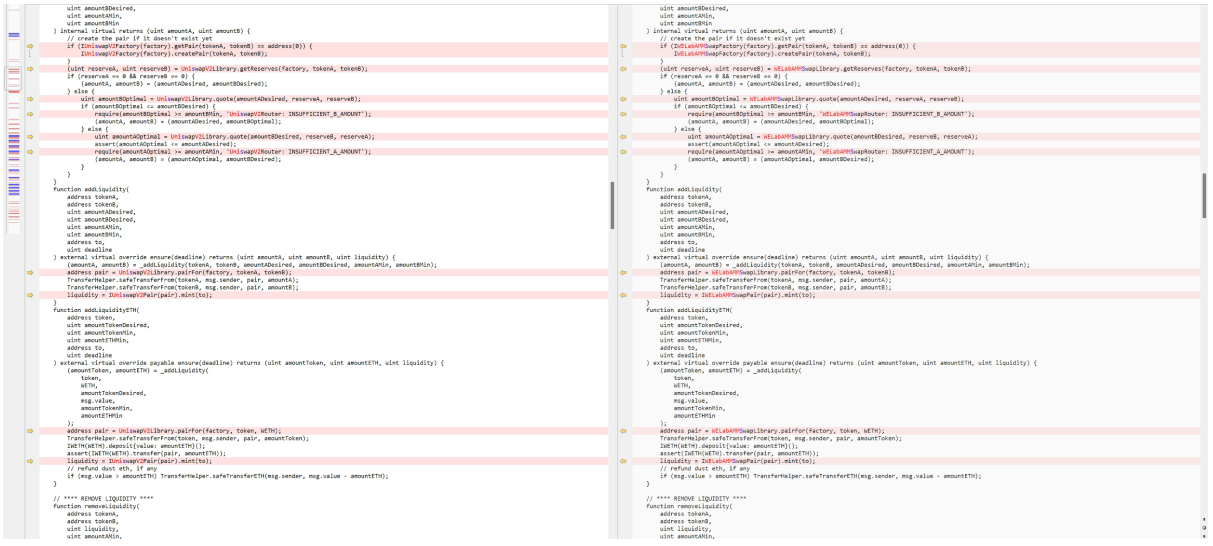
- Diff:
  - source_code/AMM-Swap/contracts/core/router.sol
  - target_code/uniswap-v2/UniswapV2Router02.sol
- Output: ./results/AMM-Swap/contracts/core/router.sol.patch

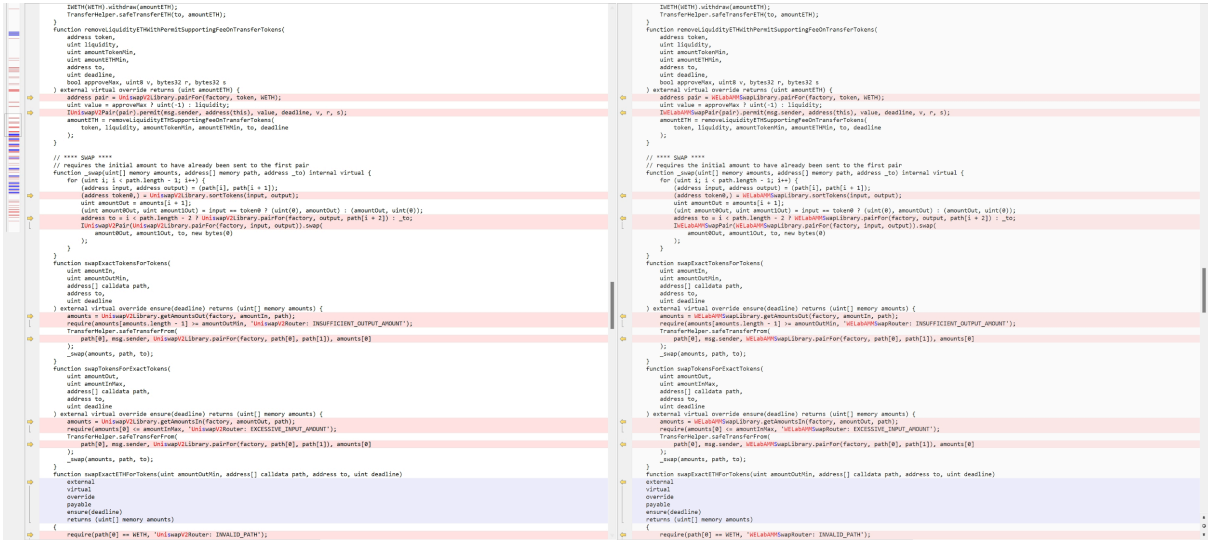
$ diff ./source_code/AMM-Swap/contracts/core/router.sol ./target_code/uniswap-v2/UniswapV2Router02.sol > ./results/AMM-Swap/contracts/core/router.sol.diff.patch

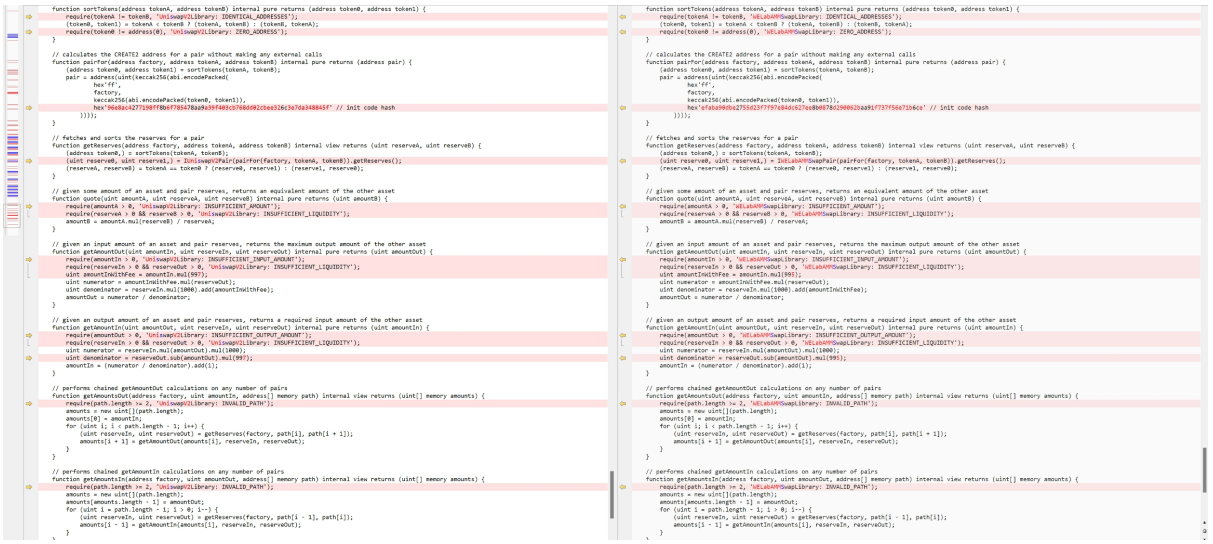
Main changes:

1. file renames
2. variable and function renames

beyond_compare result./source_code/AMM-Swap/contracts/core/router.sol







cloc compare

```
$ cloc --by-file --diff source_code/AMM-Swap/contracts/core/router.sol
target_code/uniswap-v2/UniswapV2Router02.sol --include-ext=sol
```

1 text file.
1 text file.
0 files ignored.

github.com/AlDanial/cloc v 1.90 T=0.07 s (53.7 files/s, 9792.7 lines/s)

File	blank	comment	code
source_code/AMM-Swap/contracts/core/router.sol			
same	0	24	551
modified	0	0	150
added	0	0	0
removed	1	3	0

SUM:

same	0	24	551
modified	0	0	150
added	0	0	0
removed	1	3	0
