Hello, this is wui wo tam and yangzhen. We would like to share with you our results for the flash loan based liquidation. For result, we have retrieved a profit of 43.8307 ETH by repaying a total of 1747177 USDT tokens. Our overall approach is as shown. We will first calculate the USDT needed based on the total variable debt and adjusted liquidation closing threshold of the collateral. Then, we will start to borrow USDT using ETH as collateral under a Uniswap contract. With the borrowed USDT from flash swap, we repay the part of the debt of the target users. Then we will calculate the total ETH amount X needed to repay the flash loan using the default getAmounIn function. We then convert X amount of the WBTC earned into WETH and repay the loan. The remaining will be our profits.

For detail calculation of the USDT to be borrowed, we use the formular debtToCover = (userStableDebt + userVariableDebt) \* LiquidationCloseFactorPercent

The userStableDebt is 0 in this case, we userVariableDebt equals 88.50 WBTC. The liquidation closing factor is to 50% initial based on AAVE protocol. We then convert the debtToCover into usdt with information of the price of USDT and Eth from the price oracle of AAVE. The initial earnings will be 43.005 ETH.

To further explore for profit maximization, we repeat the calculation steps above with different liquidation closing factors and plot a graph as below. Then, we try to fit a binomial curve to the dataset via excel. The theoretical maximum profit is given by a closing factor of 58.16%, with profit of 43.890 ETH. With further test and trials, we select a liquidation threshold of 58% which results in the highest profit of 43.8906 EHT in total.

And now, let’s run the code and verify the result. As shown here, a total of 43.8306 ETH has been collected as profit of this flash-loan based liquidation.