Multi-Block Attack Simulator User Guide

DEX Liquidity

Input the collateral token (i.e. ETH) and its liquidity from *Uniswap V3, V2, and OTHERS such as Curve. Replace WETH if you're using another collateral token like USDC. The USD value (C1) is for reference.*

Lending Factors

Input the borrowed token's *BORROW FACTOR*, which is the maximum percent users can borrow relative to their collateral (LTV ratio), and the collateral token's *COLLATERAL FACTOR*, if such factor is required, which is the maximum percent users can utilize of their collateral token. Input these values relative to 1 being 100% and 0 being 0%.

Lending Pools

Input the number of *AVAILABLE TOKENS* to borrow, the *USD PRICE*, and the collateral value (*ETH PRICE*) of the borrowed token (the non-collateral token). *USD VALUE* is the USD price of *AVAILABLE TOKENS* for reference.

User Position 1

Input the amount of collateral assets in *DEPOSIT*. The *MAX BORROW* will calculate the maximum amount in collateral value that the user can borrow based on the borrow and collateral factors. *MAX BORROW TOKENS* is the maximum number of tokens that the user can borrow based on the borrow and collateral factors. *NEW AVAILABLE TOKENS* shows the remaining tokens left in the lending

Liquidate Round 1

The *SELL AMOUNT* is the amount the attacker would sell on Uniswap. It's also equal to the *MAX BORROW TOKENS* in User Position 1. Input *ETH RECEIVED* is the amount of collateral the attacker would receive for selling the borrowed tokens. *PRICE IMPACT PERCENT* is determined by the difference between the *NEW PRICE* and the previous price in *ETH PRICE*. Input the *NEW PRICE* of the

To find the values for the user inputs, go to Uniswap's swap page (app.uniswap.org/swap) and select the collateral and borrowed token as the swap pair. Find the information displayed under the sell button after entering the *SELL AMOUNT* for the borrowed token into the swap field. *NEW PRICE* is the collateral price for 1 borrowed token.

For example, enter 1000 AAVE to sell. The sell button will state "Insufficient AAVE balance" unless you have 1000 AAVE. Just below this button it currently displays 1 ETH = 27.5602 AAVE ($2,627.96). Click this and it will change to 1 AAVE = 0.0363 ETH ($95.91). Copy 0.0363 as the *NEW PRICE* value. These values will be different for you.

Note that Uniswap's Auto Router will split trades across multiple pools, so users may need to find alternative interfaces to display only the target pool's values, unless the target is the only pool or other pools are inconsequential for arbitrage trades.

User Position 2

This and following user position boxes contain the same information in User Position 1 but with added cells related to the user's new position after having borrowed and sold tokens in the previous liquidation round. No inputs are necessary in this box as it is calculated for you.

NEW BORROW VALUE is the value of the borrowed tokens that were sold, calculated using the new price. *REQUIRE COLLATERAL* is the amount of collateral you need to have deposited to cover the new value of the borrowed tokens. *TOTAL ETH OWNED* is the amount of collateral deposited and the amount earned from selling the borrowed tokens.

COLLATERAL DIFFERENCE is the difference between the value of collateral in *MAX BORROW* in the previous user position and the *NEW BORROW VALUE*. *MAX BORROW TOKENS* is the same as in the previous user position but accounting for the new price and difference in collateral value. *WITHDRAWABLE* is the amount of collateral the user can withdraw after deducting the collateral required to remain deposited. *WITH SALES* includes *WITHDRAWABLE* but adds in the amount of collateral earned from the sale in the previous liquidation round.

Liquidate Round 2

This and following liquidate round boxes contain the same information in Liquidate Round 1 but with new fields to show the differences between the liquidate rounds. Only input values into the blue *ETH RECEIVED* and *NEW PRICE* cells.

The *SELL AMOUNT* is the amount the attacker would sell on Uniswap using the new *MAX BORROW TOKENS*. *ETH RECEIVED* (not blue) is the amount of collateral received from the latest borrowed token sale in *SELL AMOUNT*. *PRICE IMPACT PERCENT* is determined by the difference between the *NEW PRICE* and the previous *NEW PRICE*.

TOTAL SOLD AMOUNT is the total amount of borrowed tokens sold. Input *ETH RECEIVED* is the amount of collateral the attacker would receive for selling the borrowed tokens. The *PRICE IMPACT PERCENT* is the total price impact from all sales. Input the *NEW PRICE* of the borrowed asset by entering in the *TOTAL SOLD AMOUNT* of the borrowed token into the swap field on Uniswap like in Liquidate Round 1.

Users can create more User Position and Liquidate Round boxes until they've found it to be profitable or resolve at a loss. I've created the Final Round and Leave Collateral boxes to determine profitability or a loss at this point. Currently, the Final Round uses User Position 3 information, which means it's the assumption of a final Liquidate Round 3. Leave Collateral is similar but with the assumption that the collateral deposit will be left behind.

Final Round / Leave Collateral

SELL AMOUNT is the amount the attacker would sell on Uniswap using the last *MAX BORROW TOKENS* in User Position 3. Input *ETH RECEIVED* is the amount of collateral the attacker would receive for selling the *SELL AMOUNT* borrowed tokens on Uniswap. *WITH SALES* is the amount from sales in *ETH RECEIVED* along with the withdrawable collateral deposit amount in *WITHDRAWABLE*. *SALES* is the amount from sales in *ETH RECEIVED* along with previous *ETH RECEIVED* amounts. *AVAILABLE* is the number of tokens left in the lending pool minus the borrowed tokens already sold. *DEPOSIT LOST* is the deposited collateral amount. Profit in Final Round is calculated as *WITH SALES* minus the collateral deposit. Profit in Leave Collateral is calculated as the collateral earned in the last sales (*ETH RECEIVED*) plus the *SALES* minus the *DEPOSIT LOST*.

DEX Liquidity

DEX Liquidity	Token (i.e. WETH, USDC)	#INPUT PRICE
Uniswap V3	Uniswap V2	Others
#INPUT	#INPUT	#INPUT

Lending Factors

Borrow Factor	Collateral Factor
#INPUT	#INPUT
Token #1 (i.e. PEPE)	Token #2 (i.e. WETH)

Lending Pools

Available Tokens	USD Price	USD Value	ETH Price
#INPUT	#INPUT	#VALUE!	#INPUT

User Position 1

Deposit	Max Borrow	Max Borrow Tokens	New Available Tokens
#INPUT	#VALUE!	#VALUE!	#VALUE!
Token #2 (i.e. WETH)			

Liquidate Round 1

Sell Amount	ETH Received	Price Impact Percent	New Price
#VALUE!	#INPUT	#VALUE!	#INPUT

User Position 2

Deposit	New Borrow Value	Require Collateral	Total ETH Owned
#INPUT	#VALUE!	#VALUE!	#VALUE!
Collateral Difference	Max Borrow Tokens	Withdrawable	With Sales
#VALUE!	#VALUE!	#VALUE!	#VALUE!

Liquidate Round 2

Sell Amount	ETH Received	Price Impact Percent	
#VALUE!	#VALUE!	#VALUE!	
Total Sold Amount	ETH Received	Price Impact Percent	New Price
#VALUE!	#INPUT	#VALUE!	#INPUT

User Position 3

Deposit	New Borrow Value	Require Collateral	Total ETH Owned
#INPUT	#VALUE!	#VALUE!	#VALUE!
Collateral Difference	Max Borrow Tokens	Withdrawable	With Sales
#VALUE!	#VALUE!	#VALUE!	#VALUE!

Liquidate Round 3 / Final Round? / Leave Collateral

Liquidate Round 3				Final Round?				Leave Collateral			
Sell Amount	ETH Received	Price Impact Percent		Sell Amount (sell leftovers)	ETH Received	With Sales	Available	Sell Amount	ETH Received	Sales	Deposit Lost
#VALUE!	#VALUE!	#VALUE!		#VALUE!	#INPUT	#VALUE!	#VALUE!	#VALUE!	#INPUT	#VALUE!	#INPUT
Total Sold Amount	ETH Received	Price Impact Percent	New Price	Profit				Profit			
#VALUE!	#INPUT	#VALUE!	#INPUT	#VALUE!				#VALUE!			

User Position 4

Deposit	New Borrow Value	Require Collateral	Total ETH Owned
#INPUT	#VALUE!	#VALUE!	#VALUE!
Collateral Difference	Max Borrow Tokens	Withdrawable	With Sales
#VALUE!	#VALUE!	#VALUE!	#VALUE!

DEX Liquidity

DEX Liquidity	Token (i.e. WETH, USDC)	#INPUT PRICE
Uniswap V3	Uniswap V2	Others
#INPUT	#INPUT	#INPUT

Lending Factors

Borrow Factor	Collateral Factor
#INPUT	#INPUT
Token #1 (i.e. PEPE)	Token #2 (i.e. WETH)

Lending Pools

Available Tokens	USD Price	USD Value	ETH Price
#INPUT	#INPUT	A12*B12	#INPUT

User Position 1

Deposit	Max Borrow	Max Borrow Tokens	New Available Tokens
#INPUT	(A16*B7)*A7	B16/D12	A12-C16
B8			

Liquidate Round 1

Sell Amount	ETH Received	Price Impact Percent	New Price
C16	#INPUT	-(1-(D21/D12))	#INPUT

User Position 2

Deposit	New Borrow Value	Require Collateral	Total ETH Owned
A16	A21*D21	(B25/A7)/B7	A25+B21
Collateral Difference	Max Borrow Tokens	Withdrawable	With Sales
B16-B25	A27/D21	(A25-C25)	C27+B21

Liquidate Round 2

Sell Amount	ETH Received	Price Impact Percent	
B27	B33-B21	C33-C21	
Total Sold Amount	ETH Received	Price Impact Percent	New Price
A31+A21	#INPUT	-(1-(D33/D12))	#INPUT

User Position 3

Deposit	New Borrow Value	Require Collateral	Total ETH Owned
A16	A33*D33	(B37/A7)/B7	A37+B33
Collateral Difference	Max Borrow Tokens	Withdrawable	With Sales
B16-B37	A39/D33	(A37-C37)	C39+B33

Liquidate Round 3

Sell Amount	ETH Received	Price Impact Percent	
B39	B45-B33	C45-C33	
Total Sold Amount	ETH Received	Price Impact Percent	New Price
A43+A33	#INPUT	-(1-(D45/D24))	#INPUT

Final Round?

Sell Amount (sell leftovers)	ETH Received	With Sales	Available
B39	#INPUT	G43+C39	A12-A33
Profit			
H43-A16			

Leave Collateral

Sell Amount	ETH Received	Sales	Deposit Lost
B39	#INPUT	L43+B33	A16
Profit			
L43+M43-N43			

User Position 4

Deposit	New Borrow Value	Require Collateral	Total ETH Owned
A16	A45*D45	(B49/A7)/B7	A49+B45
Collateral Difference	Max Borrow Tokens	Withdrawable	With Sales
B16-B49	A51/D45	(A49-C49)	C51+B45

DEX Liquidity

DEX Liquidity	WETH (USD)		3,000
Uniswap V3	Uniswap V2	Others	
7.57971	0	500	

Lending Factors

Borrow Factor	Collateral Factor	
0.5	0.9	
SIMP	WETH	

Lending Pools

Available Tokens	USD Price	USD Value	ETH Price
1,124,895	0.256	287,973.11	0.000158

User Position 1

Deposit	Max Borrow	Max Borrow Tokens	New Available Tokens
30	13.5	85443.03797	1,039,452
WETH			

Liquidate Round 1

Sell Amount	ETH Received	Price Impact Percen	New Price
85,443.04	6.29113	-0.5339873418	0.00007363

User Position 2

Deposit	New Borrow Value	Require Collateral	Total ETH Owned
30	6.291170886	13.98037975	36.29113
Collateral Difference	Max Borrow Tokens	Withdrawable	With Sales
7.208829114	97906.14035	16.01962025	22.31075025

Liquidate Round 2

Sell Amount	ETH Received	Price Impact Percent	
97906.14035	0.67283	-0.2256329114	
Total Sold Amount	ETH Received	Price Impact Percen	New Price
183,349.18	6.96396	-0.7596202532	0.00003798

User Position 3

Deposit	New Borrow Value	Require Collateral	Total ETH Owned
30	6.963601793	15.47467065	36.96396
Collateral Difference	Max Borrow Tokens	Withdrawable	With Sales
6.536398207	172101.0586	14.52532935	21.48928935

Liquidate Round 3

Sell Amount	ETH Received	Price Impact Percent	
172101.0586	0.29468	-0.1111392405	
Total Sold Amount	ETH Received	Price Impact Percen	New Price
355,450.24	7.25864	-0.8707594937	0.00002042

Final Round?

Sell Amount (sell leftovers)	ETH Received	With Sales	Available
172101.0586	7.25864	21.78396935	941,545.79
Profit			
-8.216030651			

Leave Collateral

Sell Amount	ETH Received	Sales	Deposit Lost
172101.0586	22.2336	29.19756	30
Profit			
21.43116			

User Position 4

Deposit	New Borrow Value	Require Collateral	Total ETH Owned
30	7.258293839	16.12954186	37.25864
Collateral Difference	Max Borrow Tokens	Withdrawable	With Sales
6.241706161	305666.3154	13.87045814	21.12909814