Decentralized Finance and Cryptoassets

(DS4F)

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Individual Assignment

- Answers must be submitted no later than **June 15th, 2025**
- The assignment will be individual (no groups).
- You are asked to submit the file(s) through Moodle or by email to dduarte@novaims.unl.pt.
- Accepted format will the images and python file (template for the python file provided on moodle)

Year 2024 / 2025

Instructions:

- The assignment should be handed in as three files:
    1. WalletScreenshot.jpg (Image)
    2. Metamask.jpg (Image)
    3. <STUDENT_ID>_answers.py
- The answers file (a python script) should contain this dictionary with your answers:

```python
answers = {
    "name": "<Your Name>",
    "student_id": "<Your Student ID>",
    "a1":  "0x71F699312A1C23057e1CFFCaE374f5D2a1BAF1f5",  # wallet address
    "a2":  "0x1ed0655998b747d4a2c1b113322ace2842736f99aecdfa24086dc36ddc54ee0d",
    "a3":  "",        # free text answer to question 4
    "a4":  "0xdd2acde8922fdfe8cb4e0aabf2712fb0351029c30382eb16d9927cdf9779d908",  # transaction hash
    "a5":  "0xf5c9c245f925272789edd8d0a48b1129537c5914c54b1072f97be43c798658ce",  # transaction hash
    "a6":  "0x8cadeb6001a51623a1c362c3118821407eda6b1d9492a5df271e6425b67c0d8b",  # transaction hash
    "a7":  "",        # free text answer to question 7
    "a8":  "0xa687d00396e04d332468b14f64d61ce83acf23999477512823a76802615620d4",  # transaction hash
    "a9":  "0x3215ea216361b09d1044f9f13c89e11f3b7de9839130403b66ae4d5d128dd6ab",  # transaction hash
    "a10": "0x2345ca0c32d3ce10348fa9a31ae9bf7aff6cef6e8f0556a92d6fc061719dc304", # transaction hash
    "a11": "0xd1a323e2155063fd434ad9725b7b674cd429556f592ec5780bc8d05630e51912", # transaction hash
    "a12": "0x93707953e80d82c2bae1b3c0ba595020cff2ba1a6b830ff05260dd9e6c9dc943", # transaction hash
    "a13": "",       # free text answer to question 13
    "a14": "0x50b533345c32fe26a68b0c9e3ceda526d6b6f69a4ca1569c7b0dbc12adbb2a95", # transaction hash
    "a15": "0xb8614946a137b7e5b470ffa60e88ec75f6de9cc5cf5b44dba17dae06c4320f94", # transaction hash
}
```

Please use the Sepolia chain, Ethereum's Testnet, to perform the exercises. NO REAL FUNDS should be used for any of the exercises.

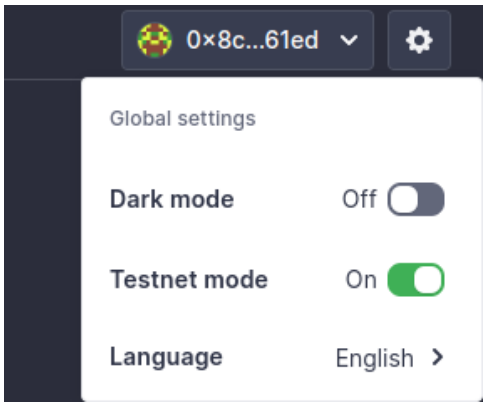
0. Install a wallet to be able to sign transactions in the browser (e.g. Metamask) and create a new Ethereum address. Show a screenshot (of the created address on the explorer (*https://sepolia.etherscan.io/address/<CREATED_ADDRESS>)*. You will need to enable the Ethereum Sepolia network on your Metamask. Enable Test networks and Choose Sepolia. Show a screenshot of that chain selected in Metamask. There should be two images as the answer to this question: *WalletScreenshot.jpg* and *Metamask.jpg*

1. Write the address as the answer to this question. (This wlll be a test address and you should not use this address for real funds)

2. Fund the account with some testnet ETH from one of the available public faucets to pay for gas. Write the transaction hash as the answer to this question.
    a. https://www.alchemy.com/faucets/ethereum-sepolia
    b. https://www.infura.io/faucet/sepolia
    c. https://sepolia-faucet.pk910.de/
    d. https://faucet.quicknode.com/avalanche
    e. Send an email to the professor with you wallet address

3. To be safe in Decentralized Finance, users should do their own research by reading the docs of any protocol they wish to use in order to know how they operate. Pick one of the following protocols and one of their products and explain in your own words what is the source of yield and what are the risks of investing in one of their products:
    - Ribbon Finance (https://app.ribbon.finance/v2/theta-vault/T-AVAX-C) - Example of a product: T-AVAX-C
    - Lido (https://lido.fi/) - Example of a product: stETH"
    - Across (https://across.to/) Example of a product: Bridge
    - Uniswap V3 (https://app.uniswap.org/) - Example of product: Position in Liquidity pool
    - Pendle (https://app.pendle.finance/) - Example of product: PT weETHs 26 Jun 2025

4. Go to the AAVE app (https://app.aave.com/), connect your wallet and enable "Testnet mode" in the settings (top right icon). Navigate to the Faucet page on Aave and get some USDC. Write down the transaction hash as the answer to this question.



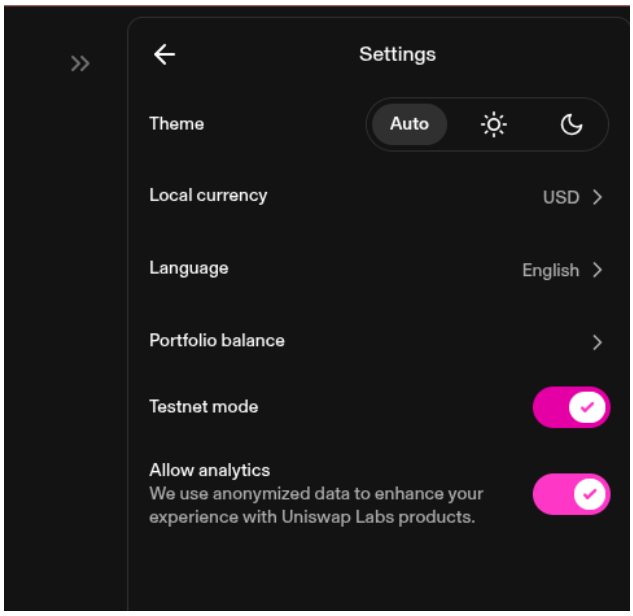
5. Also get some Wrapped BTC (WBTC) from the AAVE faucet. Write down the transaction hash as the answer to this question.

6. Supply 0.5 of the WBTC you got from the Faucet to the Aave protocol. Write down the transaction hashes for the deposit as the answer to this question

7. Explain if and why you had to approve token spending to supply the token.

8. Borrow 15,000 EURS from the Aave protocol. Write down the transaction hash as the answer to this question

9. Go to Uniswap (https://app.uniswap.org/) and enable Testnet mode in the settings. Swap some EURS to get 0.25 more WBTC . Write down the transaction hash as the answer to this question.



10. Supply the 0.25 WBTC from the previous question into AAVE. Write down the transaction hash as the answer to this question

11. Borrow some more EURS. Write down the transaction hash as the answer to this question

12. Buy some additional WBTC. Write down the transaction hash as the answer to this question

13. Describe the financial risk created by the steps performed in questions 11, 12 and 13.

14. Add liquidity to the EURS WBTC pair in Uniswap on the 0.30% fee tier in a price range approximately 15% above and 15% above the reference price. Write down the transaction hash as the answer to this question. (Note: write the transaction of supplying liquidity and not the approval)

15. Go to Opensea Testnet version (https://testnets.opensea.io/) and buy one of the NFTs from the following collection on the Ethereum Sepolia Testnet. Paste the transaction hash as the answer to this question.

    Collection Page on Opensea (Testnet):
    https://testnets.opensea.io/collection/decfin-assignment-4

    Collectible Address on Sepolia:
    0x0354989C790BF1266812dB61342F7606FcCdAe1b