Isfahan University of Technology
Information Technology Fundamentals
Dr. Manshaei
Homework 3: Module 5, Web Systems, Blockchain
Deadline: Friday 18^{th} **Khordad, at** 23 : 59

We only accept the homework **delivered via Yekta (yekta.iut.ac.ir), before the deadline**.

1. Make a Simple blockchain:

The information of the genesis block in JSON format is available. You can also download fifteen ledgers and fifteen different puzzles from the above addresses. You should find a nonce value in each round to solve the puzzle for each ledger and make the corresponding blocks. Eventually, you will compute a blockchain with 16 blocks.

Tips:

- Your codes have to be written in python.
- Use SHA-256 for producing hash.
- Your program has to print the block number, block hash, the hash of the previous block, and the nonce value in each round.
- Generating block number 16 has extra points. In the 16^{th} round, we have a more complicated computational math problem that you can not find its hash on your laptop. You can use Google Colab to run your program for solving this problem.

2. Research Question:

We have numerous blockchains. Choose two blockchains and write a report about a series of blockchain applications and features that these chosen blockchains support. Hereafter you can find a list of blockchain applications and features you need to research for your chosen blockchains:

- Cryptocurrencies
- Consensus protocol (how their consensus protocol works?)
- Ledger type
- Industry focus
- Smart contracts support (if yes, what is the programming language of that)

Please write enough explanation for each item.

What should you upload as your homework?

1. For question number one:

- Your codes.
- A video for explaining whatever you did. Please describe your codes, run your program in this video, and not interrupt the recording until every 15 blocks are created. (This video must be at most 15 minutes).

2. For question number two:

- A pdf for your answer.