Etherisc - Decentralized Insurance

DISCLAIMER: All code in these examples are not intended for use in production! These are simplified versions with reduced complexity for classroom use. Important security features may have been removed for better understanding!

Hands-on Session 2: Implement Token Staking

1. Preparation:
   a. Open Remix IDE with tutorial gist:
      https://ethereum.github.io/browser-solidity/#version=soljson-v0.4.18+commit.9cf6e910.js&optimize=false&gist=7ef5507f7c6c88523685c20b72f33cb7
   b. Create the FlightOracle contract.
   c. Create the FlightDelay contract with a different owner.
   d. Fund the FlightDelay contract with 1 ETH.
   e. Check owner of FlightOracle and FlightDelay.
   f. Set the oracle in FlightDelay with "setOracle".
   g. Change the account used for transactions.
   h. Check oracleAddress in FlightDelay.
   i. Try to create a new policy with newPolicy. Why does it fail? (if you don't change something - what?)
   j. Now create a new policy.
   k. Readout policy data from the FlightDelay Contract.
   l. Call "sendOracleData" with result = true for this policy.
   m. Check if payout was successful.
   n. Call "sendOracleData" again with result = true.
   o. What is wrong with the contract?
   p. Now open the following gist in Remix:
      https://ethereum.github.io/browser-solidity/#version=soljson-v0.4.18+commit.9cf6e910.js&optimize=false&gist=97bb200e14994eabbc989efb908c567d
   q. How is the problem solved?
2. Create a Token
   a. Create the MyToken contract.
   b. Mint some tokens to a Remix address.
   c. Transfer some tokens to another Remix address
   d. Why can't such a token be used as a staking token?
   e. Now open the following gist in Remix:
      https://ethereum.github.io/browser-solidity/#version=soljson-v0.4.18+commit.9cf6e910.js&optimize=false&gist=a2fb1cebb5185fdc52ecfd74a69766c2
   f. What is different now? Why can the token be used for staking now?

Tasks:
1. Discuss possible use-cases for token staking.
2. Read & understand the Burniske Model for token valuations
   https://medium.com/@cburniske/cryptoasset-valuations-ac83479ffca7
3. If 50% of the available token supply is bound in staking contracts, how does that affect the token price and token velocity?
4. Economic model scenario analysis:
   a. The INS-Token has a total supply of 1 million tokens.
   b. The current token price is USD 1.
   c. Now some projects need to buy INS-Tokens as risk capital for decentralized insurance. These tokens are staked as long as a project is in the market, i.e. the project can only sell policies as long as they have sufficient INS-Tokens.
   d. Imagine that every year 5 new projects need to stake USD 100K each.
   e. Imagine further that premiums have to be paid in INS-Tokens and that the premium volume is equivalent to the staked tokens.
   f. Calculate the price of the INS Token after 5 years, assuming that 90% OR 95% of the available tokens are "hodled" by speculators.
5. Modify the FlightDelaySimple contract so that the FlightOracle has to stake 50 Tokens for each active oracle query.
6. Modify the FlightDelaySimple contract so that the FlightOracle loses 50 Tokens for each query which is not answered within 5 blocks.