Instructions

- This is individual assignment work.
- This part of the assignment carries 30% of the final DLT5401 grade.
- The firm submission deadline is 5th June 2024. Hard copies are **not** required to be handed in.
- A soft-copy of the report must be uploaded to the VLE upload area by the same deadline. It is the student's responsibility to ensure that the uploaded file and its contents are valid.
- Reports (and any code) that are difficult to follow due to low quality in the writing-style/organisation/presentation will be penalised.

Problem 1

You are to read up on and investigate how to use Solana smart contracts. Note that they are typically referred to as 'programs' in the Solana ecosystem.

The scenario follows. It is 2050. The banking system as we know it crumbled — everyone has burnt their cash in the streets. People have lost faith in institutions, and also have become less trusting in general. Theft has massively increased. Safe physical trading-zones were created where people can buy and sell, knowing that security protection services are in place to minimise theft. When a purchase/sale is made, a third-party notary is present to confirm that the sale took place.

You are to create a smart contract system that provides the implementation for the safe physical trading-zone which either is implemented as decentralised infrastructure.

You are to ensure that the following functionality is implemented in the smart contract system:

1. When a buyer wants to make a purchase, they need to send the amount intended for the seller into escrow to the relevant smart contract. At this point, whilst the funds are intended for the seller, they have not yet been completely released.
2. Physical items purchased are then made ready at a pick-up station, where a notary-like agent along with the buyer inspect the products. At this point the buyer can confirm that they have inspected the product and are taking it, and confirm this by digitally signing a transaction to the relevant smart contract. The notary thereafter also confirms this to the smart contract, which immediately releases payment (and the buyer takes their products).
3. Payment is to be split into: (i) the seller's portion who receives 95% of funds; and (ii) the safe-zone is to take 5% of funds.

[Marks: 25]

Problem 2

You are to create the surrounding dApp code (HTML/JavaScript recommended) around the smart contracts to demonstrate the functionality discussed above.
[Marks: 25]

Problem 3

You are to create a report documenting Problem 1 and 2.
[Marks: 10]

Problem 4

You are to prepare and present a 45-minute tutorial recording, that demonstrates:

- How to set-up/start a coding environment to test out smart contracts in Solana.
- How to create a simple store and retrieve smart contract in Solana.
- How to connect dApp code to make a call to the store and retrieve smart contract.

[Marks: 40]