# Homework: Data-Types

## Crowdsale Contract

Create people balances contract.

* The contract holds the account balance and the balance is represented by an integer (think tokens).
* The contract has states:
  + Crowdsale state - in the first 5 minutes, where people can buy the token at a rate of 5 Tokens / 1 ETH. People cannot transfer during this period
  + Open exchange state – after that period where people can transfer the tokens.
* Minimum investment 1 ETH
* Accept only round ETH (i.e. cannot send 0.5 or 1.7 ETH)
* The contract owner can withdraw the funds after 1 year
* For each token holder there should be a boolean flag that shows if that person holds or ever held tokens
* There should be an array that contains all current or past token holders
* No duplicates :)
* Emit events where you think it’s appropriate

## Planet Earth Contract

Create contract that:

* Declares all continents (Europe, Asia, etc..). Use the best way to declare them – we know that there are fixed amount of continents and we know their names
* Declares a data representing a single country (**name, continent, population**)
* Keep track of **each country’s capital**, so people can check **country’s capital by simply giving a name**
* Store **only** European countries
* Have a function to **add** **country** (should accept **only** **European** **countries**). The function accepts all countrie’s properties (**name, continent, population**)
* Have function to add a capital to a single country (No duplicates – i.e. Sofia cannot be a capital of both Bulgaria and Romania)
* Have a function that gives the capital by a given country name
* Have a function to **remove a capital**
* Have a function that returns the string representation of each continent (i.e. I receive “Asia”, “Europe”, etc.)
* Have a function that returns all European countries

## Simple Token Contract

Create contract that represents a token with the following characteristics:

* The token has name.
* The token has symbol.
* The token has decimals (e.g. decimals = 2, value 100 should be interpreted as 1.00)
* Keep track of users balances
* Has a total supply (the total number of tokens that exists)
  + The total supply should be given as a parameter to the constructor
  + The total supply should be assigned to the contract creator
  + Keep in mind the decimals
* The contract should NOT accept ETH. Penalize everyone who is trying to send ethers to the contract.
* Have a function that transfers a number of tokens to another address
* Emit events when appropriate

## Pokemon Game

Create a Pokemon game, that:

* Knows ~10 different types of Pokemons
* Any player has multiple Pokemons
* Any player can say that he caught a Pokemon, but maximum once per 15 seconds (personalized timer)
* The contract can list the Pokemons that a player has caught
* The contract can list which player possess a Pokemon of certain type
* Watch out for duplicates!