Lebanese University
Faculty of Science
BS Computer Science
2nd Year – S3

I2204 - Imperative Programming

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Structures

Chapter 3

Exercises

Exercise: BankAccount

- define struct type BankAccount for bank account manipulation
- type should contain
  - owner name
  - id (integer value)
  - balance (real number)
- what do we call these 3 parts of BankAccount?

Exercise: create Varianles

- write a program that creates 2 variables of this type
- give values to these variables
- what do we call them other than variables?

Exercise: accounts array

- create an array of bank accounts
- call it all_accounts
- holds up to 100 elements

Exercise: createAccount

- define the function createAccount that creates and fills an account
- element values are passed as parameters
- give a call example
  - write the function createAccountTest

Exercise: initAccount

- define the function initAccount that fills an account
- elements values and structure variable to be filled are passed as parameters
- give a call example → initAccountTest

Exercise: printAccount

- define the function printAccount that displays an account on the screen
- example

  account: owner_name, 12345 has 222.2 dollars.\n
- write the test function

Exercise: deposit

- define the function deposit that adds a value to an account balance
- can only deposit positive values
  - must return 0 for failure and 1 for success
  - fill a message passed in parameter

- write the test function

Exercise: withdraw

- define the function withdraw that retrieves money from a bank balance
- can not withdraw more than the value of the current balance
  - must return 0 for failure and 1 for success
  - fill a message passed in parameter

- write the test function

Exercice: transfer

- write the function transfer from one account to another
- write transferTest

- transfer = successful withdraw + successful deposit or else nothing

Exercise: transferById

- write the function transferById which given an array of accounts, to BankAccount ids and an amount, transfers an amount of money from/to the designated accounts once it finds them in the array.
  - hint use the function transfer
- write transferByIdTest()

Exercise: Scenario

- write a complete program that tries all the previous functions
- the program creates an array of accounts
- initializes it
- provides a menu: Please choose a number
  - 1 to create a new account
  - 2 to deposit
  - 3 to withdraw
  - 4 to transfer by id
  - 5 to print an account by id
  - 6 to print all the accounts
  - 7 to exit

Summary Questions

- as function parameters
  - when to declare a variable of type T
  - and when to declare a pointer of base type T
- as function arguments
  - when to pass a variable and when to pass a reference to a variable