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PENDIDIKAN
SULTAN IDRIS
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SULTAN IDRIS EDUCATION UNIVERSITY

Assignment 1



Name	Subject
Subject code	MES 3033
SUBJECT NAME	FORMAL METHOD
Assignment Name	Individual Assignment – Bank System Z Notation Schema

Name	Subject
NAME	MUHAMMAD YUSUF BIN IBRAHIM
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Z notation for Bank Account System

1. Declare Data State
2. Initialize Bank Statement Operation
3. Calculate Bank Statement Operation
4. Determine Total Amount Operation

BankAccount

Δ Balance : \mathbb{N}

Name ? : NAME

pinNumber ? : \mathbb{N}

accNumber ? : \mathbb{N}

ExistingCustomer : NAME

InitializeBankStatement

Δ BankAccount : \mathbb{N}

Information! : seq CHAR

Name ? \notin dom ExistingCustomer

Information! : BankAccount \cup { Name \rightarrow pinNumber \rightarrow accNumber }

Balance' = 0

CalculateBalance

Δ BankAccount : \mathbb{N}

Balance' = Balance + 100

DetermineStatementBalance

Δ BankAccount : \mathbb{N}

Message ! : seq CHAR

Message! = BankAccount \cup { Name \rightarrow pinNumber \rightarrow accNumber \rightarrow Balance }

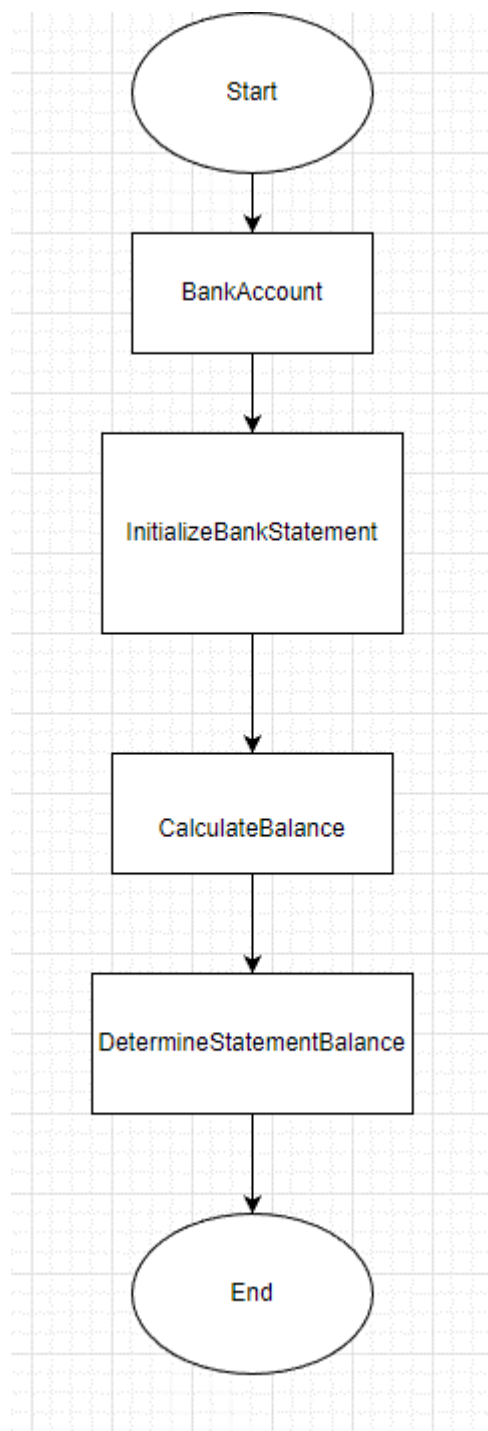
Full Problem Specification:

$\text{BankAccount} \triangleq [\text{Balance} : \mathbb{N} ; \text{Name} ? : \text{NAME}; \text{pinNumber} ? : \mathbb{N};$
 $\text{accNumber} ? : \mathbb{N} ; \text{ExistingCustomer} : \text{NAME}]$

$\text{InitializeBankStatement} \triangleq [\Delta \text{BankAccount} : \mathbb{N}; \text{Information} ! : \text{seq CHAR} |$
 $\Delta \text{BankAccount} : \mathbb{N} ; \text{Information} ! : \text{seq CHAR}]$

$\text{CalculateBalance} \triangleq [\Delta \text{BankAccount} : \mathbb{N} | \text{Balance}' = \text{Balance} + 100]$

$\text{DetermineStatementBalance} \triangleq [\Delta \text{BankAccount} : \mathbb{N}; \text{Message} ! : \text{seq CHAR} |$
 $\text{Message} ! = \text{BankAccount} \cup \{ \text{Name} \rightarrow \text{pinNumber} \rightarrow \text{accNumber} \rightarrow$
 $\text{Balance} \}]$



1. Declare BankAccount State Data
2. Initialize Bank Account: Use the InitializeBankStatement function to set the initial balance of the bank account to 0.
3. Add RM100 to Bank Account: Use the CalculateBalance function to add RM100 to the current balance of the account.
4. Show new Bank Statement Balance: Use the DetermineStatementBalance operation to show the bank statement balance based on the new balance of the account.