

External assessment 2022

Stimulus book

Digital Solutions

General instruction

- Work in this book will not be marked.

Stimulus 1

This algorithm calculates the interest on a savings account based on the amount deposited and the number of years this amount remains in the account.

```
1  BEGIN
2  INPUT depositAmount
3  INPUT years
4
5  CALCULATE interestRate = calculateInterestRate(depositAmount)
6  CALCULATE savings = calculateSavings(depositAmount, years,
    interestRate)
7
8  OUTPUT ("For a deposit of ${depositAmount} for {years} year/s at an
    interest rate of ({interestRate} × 100)%, your total savings would be
    ${savings}.")
9  END
10
11 BEGIN calculateInterestRate (depositAmount)
12  IF depositAmount <= 10000
13    value = 0.04
14  ELSE IF depositAmount > 10000 AND depositAmount <= 50000 THEN
15    value = 0.03
16  ELSE
17    value = 0.02
18  ENDIF
19  ENDIF
20  RETURN value
21 END calculateInterestRate
22
23 BEGIN calculateSavings (depositAmount, years, interestRate)
24  FOR i = 1 TO years
25    deposit = depositAmount + depositAmount × interestRate
26  NEXT i
27  ENDFOR
28  RETURN deposit
29 END calculateSavings
```

Stimulus 2

These are sample procedures and programming structures for a one-time pad encryption algorithm.

Pseudocode sub-procedures

```
indexOf( <character>, <array> )
```

Purpose: To return the index of the located character in the array.

```
lengthOf( <string of characters> )
```

Purpose: To return the number of characters in a string.

```
checkLowerCase( <string of characters> )
```

Purpose: To return 1 if only lower case characters exist or return 0 otherwise.

SET

```
lowerCaseAlphabet [ 'a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j', 'k', 'l', 'm',  
'n', 'o', 'p', 'q', 'r', 's', 't', 'u', 'v', 'w', 'x', 'y', 'z' ]
```

Example of usage: lowerCaseAlphabet[4] is equal to 'e'

Stimulus 3

This code library of functions enables secure access to student results in a database.

Function	hashPassword	
Description	Apply a hash function to a password	
Input	Return	
<ul style="list-style-type: none">• Plain text password	<ul style="list-style-type: none">• Hashed value	
Function call	hashPassword(plaintext)	

Function	checkLogin	
Description	Look up a student ID and hashed password in database	
Input	Return	
<ul style="list-style-type: none">• Student ID• Hashed value	<ul style="list-style-type: none">• True/False	
Function call	checkLogin(studentID, password)	

Function	getResults	
Description	Retrieve all results for a student ID	
Input	Return	
<ul style="list-style-type: none">• Student ID	<ul style="list-style-type: none">• Array of line of encrypted data	
Function call	getResults(studentID)	

Function	decryptData	
Description	Apply a decryption algorithm to the data using the supplied key	
Input	Return	
<ul style="list-style-type: none">• Key• Line of encrypted data	<ul style="list-style-type: none">• Line of decrypted data	
Function call	decryptData(key, resultsLine)	

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