

# PRE-RELEASE MATERIAL May/June 2018

## O-Level Computer Science 2210/22

### (Pseudocode and VB Code by Sir Majid Tahir)

In preparation for the examination candidates should attempt the following practical tasks by **writing and testing a program or programs.**

A farmer records the milk production of a herd of cows. Every cow has a unique 3-digit identity code. Each cow can be milked twice a day, seven days a week. The volume of milk from each cow is recorded in litres **correct to one decimal place** (yield) every time the cow is milked. **The size of the herd is fixed.** At the end of the week the total and the average yield for each cow for that week is calculated.

**The farmer identifies the cow that has produced the most milk that week. The farmer also identifies any cows that have produced less than 12 litres of milk on four or more days that week.**

A program is required to record the yield for each cow every time it is milked. Calculate the total weekly volume of milk for the herd and the average yield per cow in a week. **The program must also identify the cow with the best yield that week and identify any cows with a yield of less than 12 litres of milk for four or more days that week.**

Write and test a program or programs for the farmer.

- Your program or programs must include appropriate prompts for the entry of data.
- Error messages and other output need to be set out clearly and understandably.
- All variables, constants and other identifiers must have meaningful names.

You will need to complete these **three** tasks. Each task must be fully tested.

#### **TASK 1 - Record the yield.**

Write a program for TASK 1 to record the milk yields for a week. The program records and stores the identity code number and the yield every time a cow is milked.

#### **TASK 2 - Calculate the statistics.**

Using your recorded data from TASK 1, calculate and display the total weekly volume of milk for the herd to the nearest whole litre. Calculate and display the average yield per cow in a week to the nearest whole litre.

#### **TASK 3 - Identify the most productive cow and cows that are producing a low volume of milk.**

Extend TASK 2 to identify and display the identity code number and weekly yield of the cow that has produced the most milk. Also identify and display the identity code numbers of any cows with a yield of less than 12 litres of milk for four days or more in the week.

## Exam Style Questions

Declare suitable arrays.

**Array 1:** cowid(999)  
Data Type: Integer  
Purpose: To get the 3 digit cow IDs stored in the program

**Array 2:** totalmilkcow(999)  
Data Type: Single or Real or Double  
Purpose: To get the total milk stored of each cow in the herd.

**Array 3:** avgmilkcow(999)  
Data Type: Single or Real or Double  
Purpose: To store the average milk of each cow in the whole week.

Name **three** variables that you have used in **Task 1, Task2 or Task 3** and state the purpose of each one.

**Variable 1:** herdsiz  
Data Type: Integer  
Purpose: To input number of cows in the herd

**Variable 2:** weekherdmilk  
Data Type: Single or Real or Double  
Purpose: To get the total milk yield of the herd in the whole week.

**Variable 3:** highestID  
Data Type: Integer  
Purpose: To identify the highest milk producing cow in the herd.

Name **two** constant you used for **Task 1, Task2 or Task 3** and state the purpose of each one.

**Constant 1:** week  
Data Type: Integer  
Value = 7  
Purpose: Constant is used to calculate the average milk of cow in the whole week

**Constant 2:** lowmilkvalue  
Data Type: Integer  
Value = 12  
Purpose: To identify any cow producing less than 12 Litres of milk for 4 or more days

## Pseudocode of Pre-Release Material May/June 2018

### Task 1

BEGIN

Declare herdsizе, count As Integer

Declare cowid(999) As Integer

Constant week As Integer = 7

Constant lowmilkvalue As Integer = 12

Declare totalmilkcow(999), morningmilk(999), eveningmilk(999), avgmilkcow(999) As Single

PRINT("Please enter the number of cows in herd")

INPUT herdsizе // Herd size is input Once and remains fixed during entire program

For count = 1 To herdsizе

PRINT("Please Enter a NewCowid in Unique 3 digit code")

INPUT cowid(count)

While cowid(count) <100 Or cowid(count)>999 //To ensure 3-digit CowID is entered

PRINT("Invalid CowID Entered, Please Enter in VALID 3 digits AGAIN")

INPUT cowid(count)

End While

While cowid(count) ← cowid(count - 1) //To ensure that unique CowID is entered

PRINT ("Cow ID repeated, Please RE-Enter a different Cowid AGAIN")

INPUT cowid(count)

End While

Next

For count = 1 To herdsizе

PRINT (" Enter Milk Yield for cow ID no : " & cowid(count))

For days = 1 To week

PRINT (" For day : " & days)

PRINT (" Morning Yield in liters for this cow ")

INPUT morningmilk(count)

PRINT (" Evening Yield in liters for this cow ")

INPUT eveningmilk(count)

totalmilkcow(count) ← totalmilkcow(count)+morningmilk(count)+eveningmilk(count)

If totalmilkcow(count) < lowmilkvalue Then //checks if milk < 12L per day

lowmilkcow(count) ← lowmilkcow(count) + 1

End If

Next

Next



## Task 2

```
DECLARE weekherdmilk As Single
DECLARE cow As Integer
```

```
For count = 1 To herdsiz
```

```
    avgmilkcow(count) ← totalmilkcow(count) / week
```

```
    avgmilkcow(count) ← ROUND(avgmilkcow(count))
```

```
    PRINT ("Total Cowmilk Production of" & cowid(count) & "is" & (totalmilkcow(count)))
```

```
    PRINT ("Average milk of Cow in a week" & cowid(count) & "is" & (avgmilkcow(count)))
```

```
Next
```

```
For cow = 1 To herdsiz
```

```
    weekherdmilk ← weekherdmilk + totalmilkcow(cow)
```

```
Next
```

```
Weekherdmilk ← ROUND(weekherdmilk)
```

```
PRINT ("Milk Production of the Herd in whole week is" & (weekherdmilk) & "Litres")
```

## Task3

```
Declare highestmilk, highestID As Integer
```

```
For count = 1 to herdsiz
```

```
If totalmilkcow(count) > highestmilk Then
```

```
    highestmilk ← totalmilkcow(count)
```

```
    highestID ← cowid(count)
```

```
    If lowmilkcow(count) >= 4 Then//For Cow Milk less than 12L for 4 or more days
```

```
    PRINT("CowID"&cowid(count)&"has produced <12L milk"&"for" & lowmilkcow(count) & "days")
```

```
    End If
```

```
End If
```

```
Next
```

```
PRINT("The maximum milk producing cow is" & highestID & "has produced" & highestmilk)
```

```
END
```

## VB Code (Console Mode) Pre-Release Material MJ 2018

You can Paste the code in Visual Basic Console Mode to see how the code works.

Give some values as Test Data to check values and solutions.

```
Module Module1
Sub Main()
```

### 'Task 1

```
Dim herdsizе, count, lowmilkcow(999), cowid(999) As Integer
```

```
Dim totalmilkcow(999), weektotalmilkcow(999), morningmilk(999), eveningmilk(999),
avgmilkcow(999) As Single
```

```
Const week As Integer = 7
```

```
Const lowmilkvalue As Integer = 12
```

```
Console.WriteLine("Please enter the number of cows in herd")
herdsizе = Console.ReadLine()
```

```
While herdsizе > 999 Or herdsizе < 1 'Because Cow ID are not more than 3 digits
Console.WriteLine("Please Enter Valid Herd size (Not more than 999 or less than 1)")
herdsizе = Console.ReadLine()
End While
```

```
For count = 1 To herdsizе
Console.WriteLine("Please Enter a NewCowid in Unique 3 digit code")
cowid(count) = Console.ReadLine()
```

```
While cowid(count) < 100 Or cowid(count) > 999
Console.WriteLine("Invalid CowID, Please Enter CowID in 3 digits only ")
cowid(count) = Console.ReadLine()
```

```
End While
```

```
While cowid(count) = cowid(count - 1)
Console.WriteLine("Cow ID repeated, Please RE-Enter a UNIQUE CowID AGAIN")
cowid(count) = Console.ReadLine()
```

```
End While
```

```
Next
```

```
For count = 1 To herdsizе
Console.WriteLine(" Enter Milk Yield for cow ID no : " & cowid(count))
```

```
For days = 1 To week
```

```
Console.WriteLine(" For day : " & days)
```

```
Console.WriteLine(" Morning Yield in liters for this cow ")
```

```
morningmilk(count) = Console.ReadLine()
```

```
Console.WriteLine(" Evening Yield in liters for this cow ")
```

```
eveningmilk(count) = Console.ReadLine()
```

```
totalmilkcow(count) = totalmilkcow(count) + morningmilk(count) + eveningmilk(count)
```

```
avgmilkcow(count) = totalmilkcow(count) / week
```

```
avgmilkcow(count) = Math.Round(avgmilkcow(count))
```

```
If totalmilkcow(count) < lowmilkvalue Then 'checks if milk < 12L per day
lowmilkcow(count) = lowmilkcow(count) + 1
```

```
End If
```

```
Next
```

```
Next
```



## 'Task 2

```
Dim weekherdmilk As Single
Dim cow As Integer
```

```
For count = 1 To herdsiz
```

```
Console.WriteLine("Total Milk Production of Cow " & cowid(count) & " is " &
(totalmilkcow(count)) & "Litres")
```

```
Console.WriteLine("Average Production of Cow in a week of " & cowid(count) & " is " &
(avgmilkcow(count)) & " Litres")
```

```
Next
```

```
For cow = 1 To herdsiz
    weekherdmilk = weekherdmilk + totalmilkcow(cow)
    Weekherdmilk = Math.Round(weekherdmilk)
```

```
Next
```

```
Console.WriteLine("Total Milk Yield of Herd in week is" & (weekherdmilk) & "Litres")
```

## 'Task3

```
Dim highestmilk, highestID As Integer
```

```
For count = 1 To herdsiz
If totalmilkcow(count) > highestmilk Then
    highestmilk = totalmilkcow(count)
    highestID = cowid(count)
```

```
If lowmilkcow(count) >= 4 Then
Console.WriteLine("CowID " & cowid(count) & "has produced <12 litres milk" & "for" &
lowmilkcow(count) & "days")
End If
```

```
End If
Next
```

```
Console.WriteLine("The maximum milk producing cow is " & highestID & "has produced " &
highestmilk & "litres")
```

```
Console.ReadKey()
```

```
End Sub
```

```
End Module
```

