**Divided Solution for all 3 Tasks**

**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.

**Pseudocode**

//Declaration of Identifiers for task 1

CONSTANT HerdSize 100

DECLARE CowID(HerdSize), CowNo, TempCowNo, DayNo : Integer

DECLARE DayYield1, DayYield2 : Single

//Declaration of Identifiers for Task 2

DECLARE CowTotal(HerdSize), DayTotal : Single

//Declaration of Identifiers for Task 3

DECLARE CountLowDays(HerdSize) : Single

//Task 1: Record the Cow ID

FOR CowNo 1 TO HerdSize

PRINT "Cow No. : " , CowNo

PRINT "Enter 3 digit cow ID : "

INPUT CowID(CowNo)

//Validation of Cow ID using range check

WHILE CowID(CowNo) < 100 Or CowID(CowNo) > 999 DO

PRINT "Error: Enter Cow ID in 3 digits : "

INPUT CowID(CowNo)

END WHILE

//To check uniqueness of Cow ID

For TempCowNo = 1 To (CowNo - 1)

While CowID(CowNo) = CowID(TempCowNo)

PRINT "ID already used. Enter a unique ID : "

INPUT CowID(CowNo)

End While

Next TempCowNo

Next CowNo

//Task 1: Record the Yield

FOR CowNo 1 TO HerdSize

PRINT "Enter yield for cow ID " , CowID(CowNo)

CowTotal(CowNo) = 0

CountLowDays(CowNo) = 0

//Data entry of cow yield

FOR DayNo 1 TO 7

PRINT "Day No. : " , DayNo

PRINT "Enter yield of 1st milking in litres : "

INPUT DayYield1

DayYield1 Math.Round(DayYield1, 1)

PRINT "Enter yield of 2nd milking in litres : "

INPUT DayYield2

DayYield2 Math.Round(DayYield2, 1)

//For Task 1 and 2 both: calculating day total and cow total ( Required for task 2 as well)

DayTotal DayYield1 + DayYield2

CowTotal(CowNo) CowTotal(CowNo) + DayTotal

//For Task 3: Recording days for the cow producing low volume

IF DayTotal < 12 THEN

CountLowDays(CowNo) CountLowDays(CowNo) + 1

END IF

NEXT DayNo

NEXT CowNo

**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.

**Pseudocode**

//Input of daily yield to calculate the total weekly volume (consider cow ID is already input)

FOR CowNo 1 TO HerdSize

PRINT "Enter yield for cow ID " , CowID(CowNo)

CowTotal(CowNo) = 0

CountLowDays(CowNo) = 0

//Data entry of cow yield

FOR DayNo 1 TO 7

PRINT "Day No. : " , DayNo

PRINT "Enter yield of 1st milking in litres : "

INPUT DayYield1

DayYield1 Math.Round(DayYield1, 1)

PRINT "Enter yield of 2nd milking in litres : "

INPUT DayYield2

DayYield2 Math.Round(DayYield2, 1)

//For Task 2: calculating day total and cow total

DayTotal DayYield1 + DayYield2

CowTotal(CowNo) CowTotal(CowNo) + DayTotal

NEXT DayNo

NEXT CowNo

//calculating total weekly volume and average yield per cow in week

DECLARE HerdTotal, CowAverage[HerdSize]: Single

HerdTotal 0

For CowNo 1 To HerdSize

CowAverage[CowNo] CowTotal[CowNo] / 7

CowAverage(CowNo) = Math.Round(CowAverage(CowNo))

HerdTotal = HerdTotal + CowTotal(CowNo)

Next CowNo

HerdTotal = Math.Round(HerdTotal)

PRINT "Total weekly volume of herd in litres : " , HerdTotal

//Display average yield per cow in the week

PRINT "Display output:"

For CowNo = 1 To HerdSize

PRINT "Cow ID : " , CowID[CowNo]

PRINT "Average yield : " , CowAverage[CowNo]

Next CowNo

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

Extend TASK 2 to identify and display and 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.

**Pseudocode**

//From Task 1: Record the daily Yield, to calculate cow low production days

FOR CowNo 1 TO HerdSize

PRINT "Enter yield for cow ID " , CowID(CowNo)

CowTotal(CowNo) = 0

CountLowDays(CowNo) = 0

//Data entry of cow yield

FOR DayNo 1 TO 7

PRINT "Day No. : " , DayNo

PRINT "Enter yield of 1st milking in litres : "

INPUT DayYield1

DayYield1 Math.Round(DayYield1, 1)

PRINT "Enter yield of 2nd milking in litres : "

INPUT DayYield2

DayYield2 Math.Round(DayYield2, 1)

//Specially For Task 3: Recording days for the cow producing low volume

DayTotal DayYield1 + DayYield2

IF DayTotal < 12 THEN

CountLowDays(CowNo) CountLowDays(CowNo) + 1

END IF

NEXT DayNo

NEXT CowNo

'Identify the most productive cow

DECLARE BestCowID : Integer

DECLARE BestCowYield : Single

BestCowYield 0

For CowNo 1 To HerdSize

If CowTotal(CowNo) > BestCowYield Then

BestCowYield CowTotal(CowNo)

BestCowID CowID(CowNo)

End If

Next

PRINT "ID of the most productive cow : " , BestCowID

PRINT "Weekly Yield of the most productive cow : " , BestCowYield)

'Identify the cows producing low volume of milk

PRINT "List of cows producing low volume of milk : "

For CowNo 1 To HerdSize

If CountLowDays(CowNo) >= 4 Then

PRINT "Low Volume Cow ID : " , CowID(CowNo)

End If

Next CowNo

**Dear Students**

**Now you have 2 different solutions of prerelease material, already uploaded on the blog and the answers of all the following questions could be searched from there.**

**Kindly take a printout of the following pages and practice.**

**1 (a)** All variables, constants and other identifiers should have meaningful names.

**(i)** Declare suitable arrays and their purpose.

 Array 1 ...............................................................................................................................

Purpose .............................................................................................................................

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Array 2 ...............................................................................................................................

Purpose .............................................................................................................................

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**(ii)** Name **one** variable and **one** constant you used for **Task 1** and state the purpose of each

one. Give the value that would be assigned to each one and explain what it is used for.

Variable .............................................................................................................................

Data type ...........................................................................................................................

Value ...............................................................................................................................

Purpose .............................................................................................................................

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Constant ............................................................................................................................

Data type ...........................................................................................................................

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Purpose .............................................................................................................................

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**(b)** Write an algorithm to complete **Task 1**, using **either** pseudocode, programming statements

or a flowchart.

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(ii) Comment on the efficiency of your design for **Task1**.

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 **(c)** Give **two** different validation checks you could have used for data entry in **Task 1**. For each

check explain why it could be used and provide a set of data for testing.

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Reason for choice .....................................................................................................................

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Set of test data .........................................................................................................................

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Validation check 2 .....................................................................................................................

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Reason for choice .....................................................................................................................

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Set of test data .........................................................................................................................

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**(d)** Explain how your program checks and display the total weekly volume of milk for

the herd to the nearest whole litre and the average yield per cow in a week to the nearest whole litre. (**Task 2**). Any programming statements used must be fully explained.

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(ii) Comment on the efficiency of your design for **Task2**.

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**(e) i.** Write an algorithm to complete **Task 3**, using **either** pseudocode, programming statements **or** a flowchart.

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(ii) Comment on the efficiency of your design for **Task3**.

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(iii) How does your program work when there is more than one cow produce the most milk? Explain using your method given in task3.

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(f) What changes will you make if the yield has to be recorded for the whole month.

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