PBL 18

1. The following pseudocode is an example of a `CASE` structure.

```
CASE OF MyMark
   75 to 100: MyGrade ← "Distinction"
   35 to 74: MyGrade ← "Pass"
   0 to 34: MyGrade ← "Fail"
   OTHERWISE: OUTPUT "Invalid value
entered" ENDCASE
```

(i) Describe what will happen if the pseudocode is tested when `MyMark` has the following values:

27 - It would fail as it is between 0 and 34

101- “Invalid value entered” as there is no option above 100

[2]

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(ii) Use **pseudocode** to write an `IF` statement with the same functionality.

```
IF 75 <= MyMark <= 100 THEN
        OUTPUT “Distinction”
ELSE IF 35 <= MyMark <= 74 THEN
        OUTPUT “Pass”
ELSE IF 0 <= MyMark <= 34 THEN
        OUTPUT “Fail”
ELSE
        OUTPUT “Invalid value entered”
END IF
```

.....

.....

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2. A 1D array, `ClassName`, of type `STRING` contains 100 elements.

The following pseudocode represents a simple algorithm to process the array.

```
DECLARE SearchValue :
STRING DECLARE FoundFlag :
BOOLEAN DECLARE Index :
INTEGER

INPUT SearchValue
FoundFlag ←
FALSE ←Index  1

WHILE Index < 101 AND FoundFlag =
   False IF ClassName[Index] =
   SearchValue
      THEN
         OUTPUT Index
```

```
         FoundFlag ←
         TRUE
   ENDIF
   Index ← Index +
1 ENDWHILE

IF FoundFlag =
   FALSE THEN
      OUTPUT "Not found"
ENDIF
```

(a) Describe the purpose of the algorithm.

It gets the input from the user of a certain integer index value which is stored as searchvalue. The program runs through the array called ClassName and checks if the current index of the data is equal to the number entered. If it matches the FoundFlag bool changes to TRUE and program ends, otherwise FoundFlag remains FALSE and outputs “Not found”.

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(b) Draw a program flowchart to represent this algorithm.

Note that variable declarations are not required in program flowcharts.

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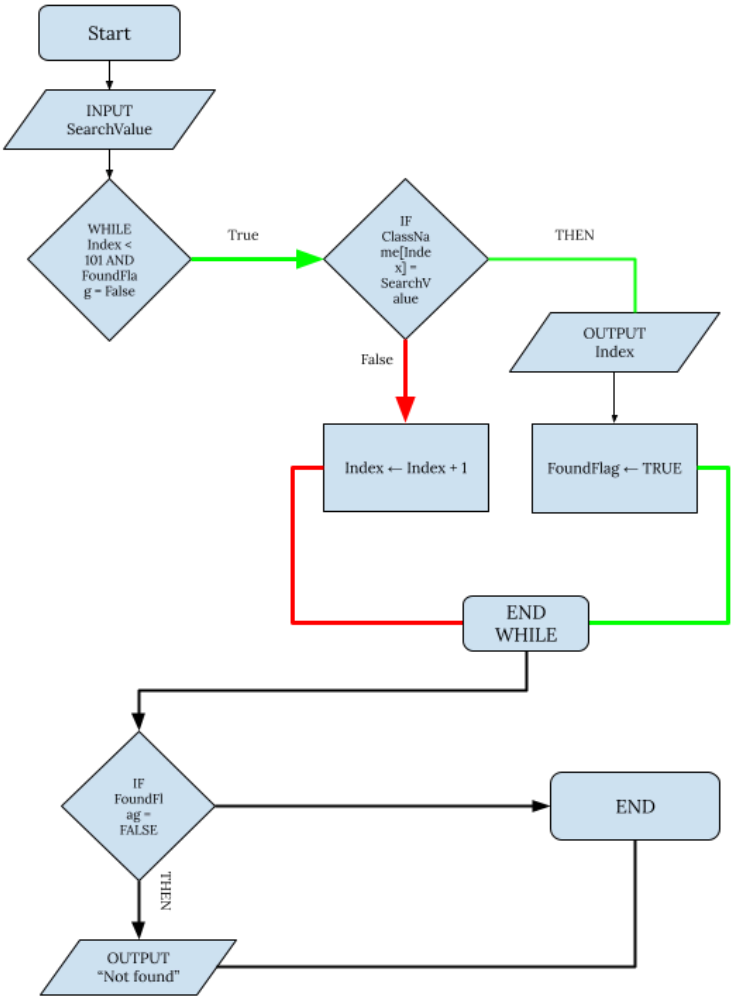

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Appendix

Built-in functions (pseudocode)

In each function, if the function call is not properly formed, the function returns an error.

```
MODULUS(x : INTEGER, y : INTEGER) RETURNS INTEGER
```

returns the remainder when `x` is divided by `y` using integer arithmetic.
Example: `MODULUS(5, 2)` will return `1`

```
INT(x : REAL) RETURNS INTEGER
```

returns the integer part of `x`.
Example: `INT(27.5415)` returns `27`

```
LENGTH(ThisString : STRING) RETURNS INTEGER
```

returns the integer value representing the length of string `ThisString`.
Example: `LENGTH("Happy Days")` returns `10`

```
LEFT(ThisString : STRING, x : INTEGER) RETURNS STRING
```

returns leftmost `x` characters from `ThisString`.
Example: `LEFT("ABCDEFGH", 3)` returns string `"ABC"`

```
RIGHT(ThisString : STRING, x : INTEGER) RETURNS STRING
```

returns rightmost `x` characters from `ThisString`.
Example: `RIGHT("ABCDEFGH", 3)` returns string `"FGH"`

```
TONUM(ThisString : STRING) RETURNS INTEGER
```

returns a numeric value equivalent to `ThisString`.
Example: `TONUM("1201")` returns integer value `1201`

Operators (pseudocode)

Operator	Description
`&`	Concatenates (joins) two strings. Example: `"Summer" & " " & "Pudding"` produces `"Summer Pudding"`
`AND`	Performs a logical `AND` on two Boolean values. Example: `TRUE AND FALSE` produces `FALSE`
`OR`	Performs a logical `OR` on two Boolean values. Example: `TRUE OR FALSE` produces `TRUE`