Arrays

Tuesday, 3 January 2023 6:51 PM

Variable: x : [30] → variable

DEC x : INT

x ← 5
x ← 10
x ← 30

Name1 :
Name2 :
Name3 :
⋮
Name12 :

12 DEC
12 INIT
12 Assignments

ARRAY: x :

index	
1	0
2	0
3	0
4	0
5	80
6	0
7	0
8	0
9	0
10	0
11	0
12	0

Lower bound → 1 ; Upper bound → 12 ; 5 → Element

DECLARE x : ARRAY[1:12] OF INT

x ← 30

x[5] ← 30 (Subscript)

i ← 5
x[i] ← 30

1200

```
FOR i ← 1 TO 12
    x[i] ← 0
NEXT
```

1. Declarations
2. Initialisation
3. Population (input to every element in a loop)
4. Searching (Linear Search)
5. Sorting (Bubble Sort)

grades (i)

1	C
2	A
3	B
4	C
5	D
6	U
7	E
8	A

1. DECLARATION:

```
DECLARE grades : ARRAY[1:8] OF CHARACTER
```

2. INITIALISE:

```
FOR i ← 1 TO 8
    grades[i] ← ''
NEXT
```

3. Population:

```
FOR i ← 1 TO 8
    INPUT theGde
    grades[i] ← theGde
NEXT
```

```
For i ← 1 TO 8
  INPUT grades[i]
NEXT
```

4. Linear Search:

```
INPUT "Enter grade to search for: ", gde
isFound ← FALSE  // Flag
FOR i ← 1 TO 8
    IF grades[i] = gde
       THEN
          OUTPUT "Grade found at location:", i
          isFound ← TRUE
    ENDIF
NEXT
IF isfound = FALSE
   THEN
      OUTPUT "Gde not found!"
ENDIF
```

5. Bubble Sort

```
c = a
a = b
b = c
```

Bubble 1.

Numbers

1	30 9
2	9 30
3	40
4	1
5	12
6	20
7	80
8	50
9	2

Y = 1: 1✓ 9 ; 2✓ 30 ; 3✓ 40 1 ; 4✓ ✗ 40 12 ; 5✓ ✗ 40 20 ; 6✓ 20 40 ; 7✓ 80 50 ; 8✓ 50 80 2 ; 9 ✗ 80

Y = 2: 1 9 ; 2 ~~30~~ 1 ; 3 ✗ ~~30~~ 12 ; 4 ~~12~~ ~~30~~ 20 ; 5 ~~20~~ 30 ; 6 40 ; 7 ~~50~~ 2 ; 8 ✗ 50 ; 9 80

Y = 3: 1 ; 2 ; 3 12 ; 4 20 ; 5 30 ; 6 ~~40~~ 2 ; 7 ✗ 40 ; 8 50 ; 9 80

Y = 4: 1 ; 2 9 ; 3 12 ; 4 20 ; 5 ~~30~~ 2 ; 6 ✗ 30 ; 7 40 ; 8 50 ; 9 80

Y = 5: 1 ; 2 9 ; 3 12 ; 4 ~~20~~ 2 ; 5 ✗ 20 ; 6 30 ; 7 40 ; 8 50 ; 9 80

Y = 7: 1 ; 2 ; 9 ; 12 ; 20 ; 30 ; 40 ; 50 ; 80

```
FOR Y ← 1 TO 7                    (8 TO 1 Step -1)
    Sorted = TRUE
    FOR i ← 1 TO 8 - Y
        IF Numbers[ i ] > Numbers[ i+1 ] THEN
            Temp ← Numbers [ i ]
            Numbers[ i ] ← Numbers [ i+1 ]
            Numbers[ i+1 ] ← Temp
            Sorted = FALSE
        ENDIF
    NEXT i
    IF Sorted = TRUE THEN EXIT FOR
NEXT Y
```