

8. A program should generate a list of unique random integers between a lower and upper limit as chosen by the user.

MARKS  
DO NOT  
WRITE IN  
THIS  
MARGIN

Enter the number of values	<input type="text" value="7"/>
Enter the minimum value	<input type="text" value="0"/>
Enter the maximum value	<input type="text" value="20"/>
The values are	<input type="text" value="1,5,7,9,13,15,19"/>

- (a) Identify two boundaries of this problem.

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The function `validNum` is used to check if a number is already present in the array or not.

When the code is tested an error is found.

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...
Line 34   FUNCTION validNum(INTEGER randomNum,
                           ARRAY OF INTEGER values) RETURNS BOOLEAN
Line 35     DECLARE valid INITIALLY FALSE
Line 36     FOR index FROM 0 TO length(values) - 1 DO
Line 37       IF values[index] = randomNum THEN
Line 38         SET valid TO FALSE
Line 39       END IF
Line 40     END FOR
Line 41     RETURN valid
Line 42   END FUNCTION

...
Line 63   DECLARE randomList as ARRAY OF INTEGER
INITIALLY [0] * <size of array>
Line 64   FOR index FROM 0 TO length(randomList) - 1 DO
Line 65     randomVal = <random number between minimum value
                   and maximum value>
Line 66     WHILE validNum(randomVal,randomList) = FALSE
Line 67       randomVal = <random number between minimum value
                   and maximum value>
Line 68   END WHILE
Line 69   SET randomList[index] TO randomVal
Line 70 END FOR

...
```



\* X 8 1 6 7 6 0 1 0 8 \*

**8. (continued)**

(b) The error is found to be in the function `validNum` shown in lines 34 to 42.

(i) Identify the error in the function.

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(ii) Describe the effect of this error when lines 63 to 70 are executed.

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(c) The error has been corrected and the code now executes as expected.

Describe how the `validNum` function could be made more efficient.

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(d) Formal and actual parameters are used in the code.

Identify a formal parameter for the `validNum` function and its associated actual parameter.

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Formal parameter \_\_\_\_\_

Actual parameter \_\_\_\_\_