



Cambridge International AS & A Level

COMPUTER SCIENCE

9618/21

Paper 2 Fundamental Problem-solving and Programming Skills

October/November 2023

INSERT

2 hours

INFORMATION

- This insert contains all the resources referred to in the questions.
- You may annotate this insert and use the blank spaces for planning. **Do not write your answers** on the insert.



This document has **4** pages.

An error will be generated if a function call is not properly formed or if the parameters are of an incorrect type or an incorrect value.

String and character functions

- A string of length 1 may be considered to be either of type CHAR or STRING
- A CHAR may be assigned to, or concatenated with, a STRING
- A STRING of length greater than 1 cannot be assigned to a CHAR

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

returns leftmost x characters from ThisString

Example: `LEFT("ABCDEFGH", 3)` returns "ABC"

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

returns rightmost x characters from ThisString

Example: `RIGHT("ABCDEFGH", 3)` returns "FGH"

`MID(ThisString : STRING, x : INTEGER, y : INTEGER) RETURNS STRING`

returns a string of length y starting at position x from ThisString

Example: `MID("ABCDEFGH", 2, 3)` returns "BCD"

`LENGTH(ThisString : STRING) RETURNS INTEGER`

returns the integer value representing the length of ThisString

Example: `LENGTH("Happy Days")` returns 10

`TO_UPPER(x : <datatype>) RETURNS <datatype>`

<datatype> may be CHAR or STRING

returns an object of type <datatype> formed by converting all characters of x to upper case.

Examples:

- `TO_UPPER("Error 803")` returns "ERROR 803"
- `TO_UPPER('a')` returns 'A'

`TO_LOWER(x : <datatype>) RETURNS <datatype>`

<datatype> may be CHAR or STRING

returns an object of type <datatype> formed by converting all characters of x to lower case.

Examples:

- `TO_LOWER("JIM 803")` returns "jim 803"
- `TO_LOWER('W')` returns 'w'

`NUM_TO_STR(x : <datatype1>) RETURNS <datatype2>`

returns a string representation of a numeric value.

<datatype1> may be REAL or INTEGER, <datatype2> may be CHAR or STRING

Example: `NUM_TO_STR(87.5)` returns "87.5"

If x is a negative value, the returned value will be a string beginning with the '-' character.

`STR_TO_NUM(x : <datatype1>) RETURNS <datatype2>`

returns a numeric representation of a string.

<datatype1> may be CHAR or STRING, <datatype2> may be REAL or INTEGER

Example: `STR_TO_NUM("23.45")` returns 23.45

IS_NUM(ThisString : <datatype>) RETURNS BOOLEAN
 returns TRUE if ThisString represents a valid numeric value.
 <datatype> may be CHAR or STRING
 Example: IS_NUM("-12.36") returns TRUE

ASC(ThisChar : CHAR) RETURNS INTEGER
 returns an integer value (the ASCII value) of ThisChar
 Example: ASC('A') returns 65, ASC('B') returns 66, etc.

CHR(x : INTEGER) RETURNS CHAR
 returns the character whose integer value (the ASCII value) is x
 Example: CHR(65) returns 'A', CHR(66) returns 'B', etc.

Numeric functions

INT(x : REAL) RETURNS INTEGER
 returns the integer part of x
 Example: INT(27.5415) returns 27

RAND(x : INTEGER) RETURNS REAL
 returns a real number in the range 0 to x (**not** inclusive of x).
 Example: RAND(87) could return 35.430729

Date functions

Date format is assumed to be DD/MM/YYYY unless otherwise stated

DAY(ThisDate : DATE) RETURNS INTEGER
 returns the current day number from ThisDate
 Example: DAY(04/10/2003) returns 4

MONTH(ThisDate : DATE) RETURNS INTEGER
 returns the current month number from ThisDate
 Example: MONTH(04/10/2003) returns 10

YEAR(ThisDate : DATE) RETURNS INTEGER
 returns the current year number from ThisDate
 Example: YEAR(04/10/2003) returns 2003

DAYINDEX(ThisDate : DATE) RETURNS INTEGER
 returns the day index number from ThisDate where Sunday = 1, Monday = 2 etc.
 Example: DAYINDEX(07/11/2023) returns 3

SETDATE(Day, Month, Year : INTEGER) RETURNS DATE
 returns a value of type DATE with the value of <Day>/<Month>/<Year>
 Example: SETDATE(26, 10, 2003) returns a date corresponding to 26/10/2003

TODAY() RETURNS DATE
 returns a value of type DATE corresponding to the current date.

Text file functions

`EOF(FileName : STRING)` RETURNS BOOLEAN

returns `TRUE` if there are no more lines to be read from file `FileName`
The function will generate an error if the file is not already open in `READ` mode.

Operators

An error will be generated if an operator is used with a value(s) of an incorrect type.

<code>&</code>	concatenates (joins) two strings. Example: <code>"Summer" & " " & "Pudding"</code> evaluates to <code>"Summer Pudding"</code> may also be used to concatenate a <code>CHAR</code> with a <code>STRING</code>
<code>AND</code>	performs a logical <code>AND</code> on two Boolean values. Example: <code>TRUE AND FALSE</code> evaluates to <code>FALSE</code>
<code>OR</code>	performs a logical <code>OR</code> on two Boolean values. Example: <code>TRUE OR FALSE</code> evaluates to <code>TRUE</code>
<code>NOT</code>	performs a logical <code>NOT</code> on a Boolean value. Example: <code>NOT TRUE</code> evaluates to <code>FALSE</code>
<code>MOD</code>	finds the remainder when one number is divided by another. Example: <code>10 MOD 3</code> evaluates to <code>1</code>
<code>DIV</code>	finds the quotient when one number is divided by another. Example <code>10 DIV 3</code> evaluates to <code>3</code>

Comparison operators

<code>=</code>	used to compare two items of the same type. evaluates to <code>TRUE</code> if the condition is true, otherwise evaluates to <code>FALSE</code>
<code>></code>	Notes: - may be used to compare types <code>REAL</code> and <code>INTEGER</code> - may be used to compare types <code>CHAR</code> and <code>STRING</code> - case sensitive when used to compare types <code>CHAR</code> and / or <code>STRING</code> - cannot be used to compare two records
<code><</code>	
<code>>=</code>	
<code><=</code>	
<code><></code>	Examples: <code>"Program" = "program"</code> evaluates to <code>FALSE</code> <code>Count = 4</code> evaluates to <code>TRUE</code> when <code>Count</code> contains the value <code>4</code>

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge Assessment International Education is part of Cambridge Assessment. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which is a department of the University of Cambridge.