

The Programming Language EGA Reference Manual

Written by Katayama Hirofumi MZ.

Copyright (C) 2020 Katayama Hirofumi MZ.

What is EGA?

EGA is a programming language of a simple grammar.

How to use

Start up EGA. The following text will be displayed:

```
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@ EGA Version 4 by katahiromz                                     @
@ Type 'exit' to exit. Type 'help' to see help. @
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
```

EGA>

Enter EGA statement (for example, `print(+(1, 2));`) and press Enter key. 3 will be shown.

```
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@ EGA Version 4 by katahiromz                                     @
@ Type 'exit' to exit. Type 'help' to see help. @
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
```

EGA> `print(+(1, 2));`

3

EGA>

To quit EGA, enter " exit ".

Introduction to EGA

The syntax of the EGA is similar to one or more C function call(s). But, in EGA, every operator is a function.

Enter " help " to see all the EGA functions:

```
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@ EGA Version 4 by katahiromz                                     @
@ Type 'exit' to exit. Type 'help' to see help. @
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
```

```
EGA> help;
EGA has the following functions:
!
!=
%
&
&&
...
and
array
...

EGA>
```

To see usage of print function, enter " help print ".

```
EGA> help print;
EGA function 'print':
  argument number: 0..256
  usage: print(value, ...)

EGA>
```

An EGA comment of EGA begins with atmark (@) and ends with newline. The comments are ignored.

The EGA values

The EGA values are integers, strings, and arrays.

An EGA integer literal is a sequence of digit(s) (0 , ..., 9).

An EGA string literal is a string wrapped by double quotations (" "). If the string contains a double quotation, it will be doubled in the string literal.

The EGA array is a list of the EGA values it contains, separated by commas (,), and wrapped by braces ({ and }).

Samples

Sample `break.ega`

```
for(i, 1, 10000, (println(i), if(>=(i, 10), break())));
```

This EGA program will outputs 0 .. 10.

Sample `fact.ega`

```
define(fact, do(set(prod, 1), for(i, 2, n, set(prod, *(prod, i))));  
  
for(k, 1, 12, (  
    set(n, k),  
    fact,  
    println("n = ", n, ": fact == ", prod)  
)  
)
```

This EGA program will outputs the factorial numbers of 1-to-12.

Sample `input.ega`

```
set(s, input("Type a string"));  
for(i, 1, +(len(s), 4), print("#"));  
println();  
println(cat("# ", s, " #"));  
for(i, 1, +(len(s), 4), print("#"));  
println();
```

This program wraps the input string by # .

Sample plus.ega

```
set(A, input("A="));
set(B, input("B="));
set(C, +(int(A), int(B)));
println(C);
```

This program calculates the sum of input `A` and `B`.

The EGA Functions

EGA 'and' Function

```
EGA function 'and':
  argument number: 2
  usage: and(value1, value2)
```

Calculates logical AND of two integers. Returns an integer.

Same as `&&`.

EGA 'array' Function

```
EGA function 'array':
  argument number: 0..256
  usage: array(value1[, ...])
```

Creates an array from specified parameters. Returns an array.

EGA 'at' Function

```
EGA function 'at':
  argument number: 2..3
  usage: at(ary_or_str, index[, value])
```

Gets or sets the item at the specified index.

`ary_or_str` must be an array or a string.

If the value is not specified, the function gets the value at the position of the specified index.

If the value is specified, the function sets the value at the position of the specified index.

Returns the value.

Same as `[]` .

EGA ' bitand ' Function

```
EGA function 'bitand':  
  argument number: 2  
  usage: bitand(value1, value2)
```

Calculates bitwise AND of two integers. Returns an integer.

Same as `&` .

EGA ' bitor ' Function

```
  argument number: 2  
  usage: bitor(value1, value2)
```

Calculates bitwise OR of two integers. Returns an integer.

Same as `|` .

EGA ' break ' Function

```
  argument number: 0  
  usage: break()
```

Goes out of an EGA loop.

EGA ' cat ' Function

```
EGA function 'cat':  
  argument number: 1..256  
  usage: cat(ary_or_str_1, ary_or_str_2, ...)
```

Concatnates the specified arrays and/or strings. Returns an array or a string.

EGA ' compare ' Function

```
EGA function 'compare':  
  argument number: 2  
  usage: compare(value1, value2)
```

Compares two values. Returns 0 if value1 and value2 are equal, -1 if value1 was less, or 1 if value1 was greater.

EGA ' compl ' Function

```
EGA function 'compl':  
  argument number: 1  
  usage: compl(value)
```

Calculates bitwise NOT. Returns an integer.

Same as `~` .

EGA ' define ' Function

```
EGA function 'define':  
  argument number: 1..2  
  usage: define(var[, expr])
```

Defines an EGA macro variable. var is a variable. Unlike the set function, the expr argument will be not evaluated. If expr is omitted, var will be reset. Returns expr .

Same as `:=` .

EGA ' div ' Function

```
EGA function 'div':  
  argument number: 2  
  usage: div(int1, int2)
```

Divides an integer value int1 by another integer value int2 . Returns an integer.

Same as `/` .

EGA 'do' Function

```
EGA function 'do':  
  argument number: 0..256  
  usage: do(expr, ...)
```

Does loop while `expr` is non-zero. The arguments will be evaluated in order. Returns the last argument. You can break the loop by `break` function.

EGA 'dump' Function

```
EGA function 'dump':  
  argument number: 0..256  
  usage: dump(value, ...)
```

Outputs the values with quotations if necessary. No return.

EGA 'dumpln' Function

```
EGA function 'dumpln':  
  argument number: 0..256  
  usage: dumpln(value, ...)
```

Same as `dump` except `dumpln` adds a newline.

Same as `?` .

EGA 'equal' Function

```
EGA function 'equal':  
  argument number: 2  
  usage: equal(value1, value2)
```

Compares two values. Returns 1 if two values are equal. zero if not equal.

Same as `==` .

EGA 'exit' Function

argument number: 0..1
usage: `exit([value])`

Ends the program with a value.

EGA 'find' Function

EGA function 'find':
argument number: 2
usage: `find(ary_or_str, target)`

Finds a target value from an array or a string. Returns the zero-based offset of the found target. Returns -1 if not found.

EGA 'for' Function

EGA function 'for':
argument number: 4
usage: `for(var, min, max, expr)`

Does loop from `min` and `max`.

The `expr` argument will be evaluated repeatedly. The `min` and `max` values must be integers. The `var` is the name of a loop variable.

1. At first, `min` will be stored into the `var` variable.
2. Then, `expr` will be evaluated.
3. `var` will be incremented upto `max`.
4. If `var` is less than `max`, then back to 2.

You can break the loop by `break` function.

EGA 'foreach' Function

EGA function 'foreach':
argument number: 3
usage: `foreach(var, ary, expr)`

Does loop using an array. `ary` is an array. The item in the `ary` array will be evaluated and stored into variable `var` repeatedly. You can break the loop by `break` function.

EGA ' greater ' Function

```
EGA function 'greater':  
  argument number: 2  
  usage: greater(value1, value2)
```

Compares two values. Returns 1 if `value1` was greater than `value2` . zero if not greater.

Same as `>` .

EGA ' greater_equal ' Function

```
EGA function 'greater_equal':  
  argument number: 2  
  usage: greater_equal(value1, value2)
```

Compares two values. Returns 1 if `value1` was greater than `value2` or equal. Otherwise returns zero.

Same as `>=` .

EGA ' if ' Function

```
EGA function 'if':  
  argument number: 2..3  
  usage: if(cond, true_case[, false_case])
```

Chooses the execution by the condition.

If the integer value `cond` was non-zero, then `true_case` will be evaluated. If `cond` was zero, then `false_case` will be evaluated if any. Returns the evaluated value of `true_case` or `false_case` .

EGA ' input ' Function

```
EGA function 'input':  
  argument number: 0..1  
  usage: input([message])
```

Gets a text string as input from EGA console. `message` will be shown if any. Returns the text string.

EGA 'int' Function

```
EGA function 'int':  
  argument number: 1  
  usage: int(value)
```

Converts a value to an integer value. Returns an integer.

EGA 'left' Function

```
EGA function 'left':  
  argument number: 2  
  usage: left(ary_or_str, count)
```

Returns an array or a string of `count` items at the left side of an array or a string.

EGA 'len' Function

```
EGA function 'len':  
  argument number: 1  
  usage: len(ary_or_str)
```

Returns the length of an array or a string.

EGA 'less' Function

```
EGA function 'less':  
  argument number: 2  
  usage: less(value1, value2)
```

Compares two values. Returns 1 if `value1` was less than `value2` . zero if not less.

Same as `<` .

EGA ' less_equal ' Function

```
EGA function 'less':  
  argument number: 2  
  usage: less_equal(value1, value2)
```

Compares two values. Returns 1 if `value1` was less than `value2` or equal. Otherwise returns zero.

Same as `<=` .

EGA ' mid ' Function

```
EGA function 'mid':  
  argument number: 3..4  
  usage: mid(ary_or_str, index, count[, value])
```

Returns the sequence of the specified range of an array or a string. `ary_or_str` must be an array or a string. The range starts from offset `index` . The length of the range is `count` . If `value` is specified, the range will be replaced with a value of `value` .

EGA ' minus ' Function

```
EGA function 'minus':  
  argument number: 1..2  
  usage: minus(int1[, int2])
```

Negates or subtract. `int1` and `int2` must be integers. Returns an integer.

Same as `-` .

EGA ' mod ' Function

```
EGA function 'mod':  
  argument number: 2  
  usage: mod(int1, int2)
```

Calculates the remainder of division of two integers. `int2` must be non-zero. Returns an integer. Same as `%` .

EGA ' mul ' Function

```
EGA function 'mul':  
  argument number: 2  
  usage: mul(int1, int2)
```

Calculates multiplication of two integers. Returns an integer.

Same as `*` .

EGA ' not ' Function

```
EGA function 'not':  
  argument number: 1  
  usage: not(value)
```

Calculates logical NOT of the value. Returns an integer. Same as `!` .

EGA ' not_equal ' Function

```
EGA function 'not_equal':  
  argument number: 2  
  usage: not_equal(value1, value2)
```

Compares two values. Returns 1 if `value1` was different from `value2` . Otherwise returns zero. Same as `!=` .

EGA ' or ' Function

```
EGA function 'or':  
  argument number: 2  
  usage: or(value1, value2)
```

Calculates logical OR of two values. Returns an integer.

Same as `||` .

EGA ' plus ' Function

```
EGA function 'plus':  
  argument number: 2  
  usage: plus(int1, int2)
```

Calculates sum of two integer values. Returns an integer.

Same as + .

EGA ' print ' Function

```
EGA function 'print':  
  argument number: 0..256  
  usage: print(value, ...)
```

Outputs the values without quotation. No return.

EGA ' println ' Function

```
EGA function 'println':  
  argument number: 0..256  
  usage: println(value, ...)
```

Outputs the values without quotation with a newline. No return.

EGA ' remove ' Function

```
EGA function 'remove':  
  argument number: 2  
  usage: remove(ary_or_str, target)
```

Returns an array or a string, whose parts are removed.

If `ary_or_str` is an array, the items with the same value as `target` are removed. If `ary_or_str` is a string, the substrings `target` are removed. Returns the array or the string of the results. This function doesn't change `ary_or_str` .

EGA ' replace ' Function

```
EGA function 'replace':  
  argument number: 3  
  usage: replace(ary_or_str, from, to)
```

If `ary_or_str` is an array, every item with the same value as the `from` value are replaced with the `to` value. If `ary_or_str` is a string, the substrings `from` are replaced with the `to` string. Returns the array or the string of the results. This function doesn't change `ary_or_str`.

EGA ' right ' Function

```
EGA function 'right':  
  argument number: 2  
  usage: right(ary_or_str, count)
```

Returns an array or a string of `count` items at the right side of an array or a string.

EGA ' set ' Function

```
EGA function 'set':  
  argument number: 1..2  
  usage: set(var[, value])
```

Creates a variable whose value is `value`. If `value` is not specified, the variable is cleared. Returns the value.

Same as `=`.

EGA ' str ' Function

```
EGA function 'str':  
  argument number: 1  
  usage: str(value)
```

Converts the value to a string. Returns a string.

EGA 'typeid' Function

```
EGA function 'typeid':  
  argument number: 1  
  usage: typeid(value)
```

Returns the type ID of the value.

If the value is an integer, then returns zero. If the value is a string, then returns 1. If the value is an array, then returns 2.

EGA 'while' Function

```
EGA function 'while':  
  argument number: 2  
  usage: while(cond, expr)
```

Does loop while the specified condition is non-zero. The `expr` argument will be evaluated repeatedly. The `cond` is the condition.

1. At first `cond` will be evaluated. If it was zero, then loop will be ended.
2. `expr` will be evaluated. Back to 1.

You can break the loop by `break` function.

EGA 'xor' Function

```
EGA function 'xor':  
  argument number: 2  
  usage: xor(value1, value2)
```

Calculates bitwise XOR of two integers. Returns an integer.

Same as `^`.

RisohEditor EGA extension

RisohEditor EGA has the following function as EGA extension:

- RES_search
- RES_delete

- RES_clone_by_name
- RES_clone_by_lang
- RES_unload_res

EGA ' RES_search ' Function

```
EGA function 'RES_search':
  argument number: 0..3
  usage: RES_search([type[, name[, lang]]])
```

RES_search returns an array of the resource items.

type must be an integer or a string of a resource type. If type is zero or omitted, then search all resource types. name must be an integer or a string of a resource name. If name is zero or omitted, then search all resource names. lang must be an integer that specifies the language ID. If lang is -1 or omitted, then search all resource languages.

EGA ' RES_delete ' Function

```
EGA function 'RES_delete':
  argument number: 0..3
  usage: RES_delete([type[, name[, lang]]])
```

RES_delete deletes the resource items.

type must be an integer or a string of a resource type. If type is zero or omitted, then search all resource types. name must be an integer or a string of a resource name. If name is zero or omitted, then search all resource names. lang must be an integer that specifies the language ID. If lang is -1 or omitted, then search all resource languages.

Returns 1 if deleted. Otherwise returns zero.

EGA ' RES_clone_by_name ' Function

```
EGA function 'RES_clone_by_name':
  argument number: 3
  usage: RES_clone_by_name(type, src_name, dest_name)
```

RES_clone_by_name clones the resource data as another resource name.

`type` must be an integer or a string of a resource type. If `type` is zero, then search all resource types. `src_name` must be an integer or a string of a resource name. If `src_name` is zero, then search all resource names. `dest_name` must be an integer or a string of a new resource name.

Returns 1 if cloned. Otherwise returns zero.

EGA ' RES_clone_by_lang ' Function

```
EGA function 'RES_clone_by_lang':  
  argument number: 4  
  usage: RES_clone_by_name(type, name, src_lang, dest_lang)
```

`RES_clone_by_name` clones the resource data as another resource language.

`type` must be an integer or a string of a resource type. If `type` is zero, then search all resource types. `name` must be an integer or a string of a resource name. If `name` is zero, then search all resource names. `src_lang` must be an integer that specifies the source language ID. If `lang` is -1, then search all resource languages. `dest_lang` must be an integer that specifies the destination language ID.

Returns 1 if cloned. Otherwise returns zero.

EGA ' RES_unload_res ' Function

```
EGA function 'RES_unload_res':  
  argument number: 0  
  usage: RES_unload_res()
```

`RES_unload_res` unloads the " resource.h " file. Always returns 1 .