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Modul:Unicode data/combining/Doku

Dies ist die Dokumentationsseite für Modul:Unicode data/combining

Contains data used by [Module:Unicode data](#) to determine whether a character is combining or not. Can also be used to return the character's **combining class**. Generated from [DerivedCombiningClass.txt](#) using a [script](#).

Modul:Unicode data

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Usage

This module provides functions that access information on Unicode code points. The information is retrieved from data modules generated from the [Unicode Character Database](#), or derived by rules given in the [Unicode Specification](#). It and its submodules were copied from English Wiktionary and then modified; see [there](#) for more information.

Functions

Vorlage:Code

Receives a code point (number) and returns its name or label; for example, [Vorlage:Code](#) returns [Vorlage:Code](#).

For example, [Vorlage:Tnull](#) → `<reserved-0061>`

Vorlage:Code

Template-invokable functions that allow access to the functions starting with `lookup` and `is`. Replace the first underscore in the function name with a pipe. For most of the functions, add the code point in hexadecimal base as the next parameter, but for `is_Latin`, `is_rtl`, and `is_valid_pagename`, add text. [HTML character references](#) in the text are decoded by the module into code points.

For example, [Vorlage:Tnull](#) → **Lua-Fehler in Zeile 293: attempt to index local 'data_module' (a boolean value).**

Data modules

The data used by functions in this module is found in [submodules](#). Some are generated by [AWK](#) scripts shown at [User:Kephir/Unicode](#) on English Wiktionary, others by Lua scripts on the `/make` subpages of the submodules.

- [Module:Unicode data/aliases](#): the formal name aliases for characters (from [NameAliases.txt](#))
- [Module:Unicode data/blocks](#): the list of Unicode blocks (from [Blocks.txt](#))
- [Module:Unicode data/category](#): data mapping characters to their General Category (from [DerivedGeneralCategory.txt](#))
- [Module:Unicode data/control](#): data for identifying characters that belong to the General Categories of Separator and Other (from [DerivedGeneralCategory.txt](#))



- [Module:Unicode data/combining](#): data mapping characters to their Combining Classes (from [DerivedCombiningClass.txt](#))
- [Module:Unicode data/Hangul](#): data used to generate the names of [Hangul](#) syllables (from [Jamo.txt](#))
- [Module:Unicode data/scripts](#): data mapping characters to their Unicode script properties (from [Scripts.txt](#)).

The name data modules ([Module:Unicode data/names/xxx](#)) were compiled from [UnicodeData.txt](#). Each one contains, at maximum, code points U+xxx000 to U+xxxFFF. **Lua-Fehler in mw.title.lua, Zeile 206: too many expensive function calls**

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```
local p = {}  
  
local floor = math.floor  
  
local function errorf(level, ...)  
    if type(level) == "number" then  
        return error(string.format(...), level + 1)
```



```
        else -- level is actually the format string.
            return error(string.format(level, ...), 2)
        end
    end
end

local function binary_range_search(codepoint, ranges)
    local low, mid, high
    low, high = 1, ranges.length or require "Module:TableTools".length(ranges)
    while low <= high do
        mid = floor((low + high) / 2)
        local range = ranges[mid]
        if codepoint < range[1] then
            high = mid - 1
        elseif codepoint <= range[2] then
            return range, mid
        else
            low = mid + 1
        end
    end
    return nil, mid
end
p.binary_range_search = binary_range_search

--[[
local function linear_range_search(codepoint, ranges)
    for i, range in ipairs(ranges) do
        if range[1] <= codepoint and codepoint <= range[2] then
            return range
        end
    end
end
end
--]]

-- Load a module by indexing "loader" with the name of the module minus the
-- "Module:Unicode data/" part. For instance, loader.blocks returns
-- [[Module:Unicode data/blocks]]. If a module cannot be loaded, false will be
-- returned.
local loader = setmetatable({}, {
    __index = function (self, key)
        local success, data = pcall(mw.loadData, "Module:Unicode data/" .. key)
        if not success then
            data = false
        end
        self[key] = data
        return data
    end
})

-- For the algorithm used to generate Hangul Syllable names,
-- see "Hangul Syllable Name Generation" in section 3.12 of the
-- Unicode Specification:
-- https://www.unicode.org/versions/Unicode11.0.0/ch03.pdf
local name_hooks = {
    { 0x00, 0x1F, "<control-%04X>" }, -- C0 control characters
    { 0x7F, 0x9F, "<control-%04X>" }, -- DEL and C1 control characters
    { 0x3400, 0x4DBF, "CJK UNIFIED IDEOGRAPH-%04X" }, -- CJK Ideograph Extension A
    { 0x4E00, 0x9FFF, "CJK UNIFIED IDEOGRAPH-%04X" }, -- CJK Ideograph Extension B
    { 0xAC00, 0xD7A3, function (codepoint) -- Hangul Syllables
        local Hangul_data = loader.Hangul
        local syllable_index = codepoint - 0xAC00

        return ("HANGUL SYLLABLE %s%s%s"):format(
            Hangul_data.leads[floor(syllable_index / Hangul_data.final_syllable_count)],
            Hangul_data.vowels[floor((syllable_index % Hangul_data.final_syllable_count) / Hangul_data.vowel_count)],
            Hangul_data.consonants[floor(syllable_index % Hangul_data.vowel_count)]
        )
    end
}
end
```

```
        / Hangul_data.trail_count)],
        Hangul_data.trails[syllable_index % Hangul_data.trail_co
    end },
    -- High Surrogates, High Private Use Surrogates, Low Surrogates
    { 0xD800, 0xDFFF, "<surrogate-%04X>" },
    { 0xE000, 0xF8FF, "<private-use-%04X>" }, -- Private Use
    -- CJK Compatibility Ideographs
    { 0xF900, 0xFA6D, "CJK COMPATIBILITY IDEOGRAPH-%04X" },
    { 0xFA70, 0xFAD9, "CJK COMPATIBILITY IDEOGRAPH-%04X" },
    { 0x17000, 0x187F7, "TANGUT IDEOGRAPH-%04X" }, -- Tangut Ideograph
    { 0x18800, 0x18AFF, function (codepoint)
        return ("TANGUT COMPONENT-%03d"):format(codepoint - 0x187FF)
    end },
    { 0x18D00, 0x18D08, "TANGUT IDEOGRAPH-%04X" }, -- Tangut Ideograph Supp
    { 0x1B170, 0x1B2FB, "NUSHU CHARACTER-%04X" }, -- Nushu
    { 0x20000, 0x2A6DF, "CJK UNIFIED IDEOGRAPH-%04X" }, -- CJK Ideograph Ex
    { 0x2A700, 0x2B738, "CJK UNIFIED IDEOGRAPH-%04X" }, -- CJK Ideograph Ex
    { 0x2B740, 0x2B81D, "CJK UNIFIED IDEOGRAPH-%04X" }, -- CJK Ideograph Ex
    { 0x2B820, 0x2CEA1, "CJK UNIFIED IDEOGRAPH-%04X" }, -- CJK Ideograph Ex
    { 0x2CEB0, 0x2EBE0, "CJK UNIFIED IDEOGRAPH-%04X" }, -- CJK Ideograph Ex
    -- CJK Compatibility Ideographs Supplement (Supplementary Ideographic Pla
    { 0x2F800, 0x2FA1D, "CJK COMPATIBILITY IDEOGRAPH-%04X" },
    { 0xE0100, 0xE01EF, function (codepoint) -- Variation Selectors Supplem
        return ("VARIATION SELECTOR-%d"):format(codepoint - 0xE0100 + 17)
    end},
    { 0x30000, 0x3134A, "CJK UNIFIED IDEOGRAPH-%04X" }, -- CJK Ideograph Ex
    { 0xF0000, 0xFFFFD, "<private-use-%04X>" }, -- Plane 15 Private Use
    { 0x100000, 0x10FFFFD, "<private-use-%04X>" } -- Plane 16 Private Use
}
name_hooks.length = #name_hooks

local name_range_cache

local function generate_name(data, codepoint)
    if type(data) == "string" then
        return data:format(codepoint)
    else
        return data(codepoint)
    end
end

end

--[
-- Checks that the code point is a number and in range.
-- Does not check whether code point is an integer.
-- Not used
local function check_codepoint(funcName, argIdx, val)
    require 'libraryUtil'.checkType(funcName, argIdx, val, 'number')
    if codepoint < 0 or 0x10FFFF < codepoint then
        errorf("Codepoint %04X out of range", codepoint)
    end
end

end
--]]

-- https://www.unicode.org/versions/Unicode11.0.0/ch04.pdf, section 4.8
function p.lookup_name(codepoint)
    -- U+FDD0-U+FDEF and all code points ending in FFFE or FFFF are Unassigne
    -- (Cn) and specifically noncharacters:
    -- https://www.unicode.org/faq/private_use.html#nonchar4
    if 0xFDD0 <= codepoint and (codepoint <= 0xFDEF
        or floor(codepoint % 0x10000) >= 0xFFFFE) then
        return ("<noncharacter-%04X>"):format(codepoint)
    end
end
```

```
    if name_range_cache -- Check if previously used "name hook" applies to the
        and codepoint >= name_range_cache[1]
        and codepoint <= name_range_cache[2] then
            return generate_name(name_range_cache[3], codepoint)
        end

    local range = binary_range_search(codepoint, name_hooks)
    if range then
        name_range_cache = range
        return generate_name(range[3], codepoint)
    end

    local data = loader[('names/%03X'):format(codepoint / 0x1000)]

    if data and data[codepoint] then
        return data[codepoint]

        -- Unassigned (Cn) consists of noncharacters and reserved characters.
        -- The character has been established not to be a noncharacter,
        -- and if it were assigned, its name would already have been retrieved,
        -- so it must be reserved.
    else
        return ("<reserved-%04X>"):format(codepoint)
    end
end

--[[
-- No image data modules on Wikipedia yet.
function p.lookup_image(codepoint)
    local data = loader[('images/%03X'):format(codepoint / 0x1000)]

    if data then
        return data[codepoint]
    end
end
--]]

local planes = {
    [ 0] = "Basic Multilingual Plane";
    [ 1] = "Supplementary Multilingual Plane";
    [ 2] = "Supplementary Ideographic Plane";
    [ 3] = "Tertiary Ideographic Plane";
    [14] = "Supplementary Special-purpose Plane";
    [15] = "Supplementary Private Use Area-A";
    [16] = "Supplementary Private Use Area-B";
}

-- Load [[Module:Unicode data/blocks]] if needed and assign it to this variable.
local blocks

local function block_iter(blocks, i)
    i = i + 1
    local data = blocks[i]
    if data then
        -- Unpack doesn't work on tables loaded with mw.loadData.
        return i, data[1], data[2], data[3]
    end
end

-- An ipairs-type iterator generator for the list of blocks.
function p.enum_blocks()
    local blocks = loader.blocks
    return block_iter, blocks, 0
end
```

```
function p.lookup_plane(codepoint)
    local i = floor(codepoint / 0x10000)
    return planes[i] or ("Plane %u"):format(i)
end

function p.lookup_block(codepoint)
    local blocks = loader.blocks
    local range = binary_range_search(codepoint, blocks)
    if range then
        return range[3]
    else
        return "No Block"
    end
end

function p.get_block_info(name)
    for i, block in ipairs(loader.blocks) do
        if block[3] == name then
            return block
        end
    end
end

function p.is_valid_pagename(pagename)
    local has_nonws = false

    for cp in mw.ustring.gcodepoint(pagename) do
        if (cp == 0x0023) -- #
        or (cp == 0x005B) -- [
        or (cp == 0x005D) -- ]
        or (cp == 0x007B) -- {
        or (cp == 0x007C) -- |
        or (cp == 0x007D) -- }
        or (cp == 0x180E) -- MONGOLIAN VOWEL SEPARATOR
        or ((cp >= 0x2000) and (cp <= 0x200A)) -- spaces in General Punct
        or (cp == 0xFFFFD) -- REPLACEMENT CHARACTER
        then
            return false
        end

        local printable, result = p.is_printable(cp)
        if not printable then
            return false
        end

        if result ~= "space-separator" then
            has_nonws = true
        end
    end

    return has_nonws
end

local function manual_unpack(what, from)
    if what[from + 1] == nil then
        return what[from]
    end

    local result = {}
    from = from or 1
    for i, item in ipairs(what) do
        if i >= from then
            table.insert(result, item)
        end
    end
end
```

```
        end
    end
    return unpack(result)
end

local function compare_ranges(range1, range2)
    return range1[1] < range2[1]
end

-- Creates a function to look up data in a module that contains "singles" (a
-- code point-to-data map) and "ranges" (an array containing arrays that contain
-- the low and high code points of a range and the data associated with that
-- range).
-- "loader" loads and returns the "singles" and "ranges" tables.
-- "match_func" is passed the code point and either the data or the "dots", and
-- generates the final result of the function.
-- The varargs ("dots") describes the default data to be returned if there wasn't
-- a match.
-- In case the function is used more than once, "cache" saves ranges that have
-- already been found to match, or a range whose data is the default if there
-- was no match.
local function memo_lookup(data_module_subpage, match_func, ...)
    local dots = { ... }
    local cache = {}
    local singles, ranges

    return function (codepoint)
        if not singles then
            local data_module = loader[data_module_subpage]
            singles, ranges = data_module.singles, data_module.ranges
        end

        if singles[codepoint] then
            return match_func(codepoint, singles[codepoint])
        end

        local range = binary_range_search(codepoint, cache)
        if range then
            return match_func(codepoint, manual_unpack(range, 3))
        end

        local range, index = binary_range_search(codepoint, ranges)
        if range then
            table.insert(cache, range)
            table.sort(cache, compare_ranges)
            return match_func(codepoint, manual_unpack(range, 3))
        end

        if ranges[index] then
            local dots_range
            if codepoint > ranges[index][2] then
                dots_range = {
                    ranges[index][2] + 1,
                    ranges[index + 1] and ranges[index + 1][1]
                }
            else -- codepoint < range[index][1]
                dots_range = {
                    ranges[index - 1] and ranges[index - 1][2],
                    ranges[index][1] - 1,
                    unpack(dots)
                }
            end
            return match_func(codepoint, dots_range)
        end

        table.sort(cache, compare_ranges)
    end
end
```

```
                end
                return match_func(codepoint)
            end
        end
end

-- Get a code point's combining class value in [[Module:Unicode data/combining]]
-- and return whether this value is not zero. Zero is assigned as the default
-- if the combining class value is not found in this data module.
-- That is, return true if character is combining, or false if it is not.
-- See https://www.unicode.org/reports/tr44/#Canonical\_Combining\_Class\_Values for
-- more information.
p.is_combining = memo_lookup(
    "combining",
    function (codepoint, combining_class)
        return combining_class and combining_class ~= 0 or false
    end,
    0)

function p.add_dotted_circle(str)
    return (mw.uststring.gsub(str, ".",
        function(char)
            if p.is_combining(mw.uststring.codepoint(char)) then
                return '◌' .. char
            end
        end))
end

end

local lookup_control = memo_lookup(
    "control",
    function (codepoint, ccc)
        return ccc or "assigned"
    end,
    "assigned")
p.lookup_control = lookup_control

function p.is_assigned(codepoint)
    return lookup_control(codepoint) ~= "unassigned"
end

function p.is_printable(codepoint)
    local result = lookup_control(codepoint)
    return (result == "assigned") or (result == "space-separator"), result
end

function p.is_whitespace(codepoint)
    local result = lookup_control(codepoint)
    return (result == "space-separator"), result
end

p.lookup_category = memo_lookup(
    "category",
    function (codepoint, category)
        return category
    end,
    "Cn")

local lookup_script = memo_lookup(
    "scripts",
    function (codepoint, script_code)
        return script_code or 'Zzzz'
    end,
    "Zzzz")
p.lookup_script = lookup_script
```

```
function p.get_best_script(str)
  -- Check type of argument, because mw.text.decode coerces numbers to strings
  require "libraryUtil".checkType("get_best_script", 1, str, "string")

  -- Convert HTML character references (including named character references
  -- or character entities) to characters.
  str = mw.text.decode(str, true)

  local scripts = {}
  for codepoint in mw.ustr.gcodepoint(str) do
    local script = lookup_script(codepoint)

    -- Ignore "Inherited", "Undetermined", or "Uncoded" scripts.
    if not (script == "Zyyy" or script == "Zinh" or script == "Zzzz")
      scripts[script] = true
    end
  end

  -- If scripts does not contain two or more keys,
  -- return first and only key (script code) in table.
  if not next(scripts, next(scripts)) then
    return next(scripts)
  end -- else return majority script, or else "Zzzz"?
end

function p.is_Latin(str)
  require "libraryUtil".checkType("get_best_script", 1, str, "string")
  str = mw.text.decode(str, true)

  -- Search for the leading bytes that introduce the UTF-8 encoding of the
  -- code points U+0340-U+10FFFF. If they are not found and there is at least
  -- one Latin-script character, the string counts as Latin, because the rest
  -- of the characters can only be Zyyy, Zinh, and Zzzz.
  -- The only scripts found below U+0370 (the first code point of the Greek
  -- and Coptic block) are Latn, Zyyy, Zinh, and Zzzz.
  -- See the codepage in the [[UTF-8]] article.
  if not str:find "[\205-\244]" then
    for codepoint in mw.ustr.gcodepoint(str) do
      if lookup_script(codepoint) == "Latn" then
        return true
      end
    end
  end

  local Latn = false

  for codepoint in mw.ustr.gcodepoint(str) do
    local script = lookup_script(codepoint)

    if script == "Latn" then
      Latn = true
    elseif not (script == "Zyyy" or script == "Zinh"
      or script == "Zzzz") then
      return false
    end
  end

  return Latn
end

-- Checks that a string contains only characters belonging to right-to-left
-- scripts, or characters of ignorable scripts.
function p.is_rtl(str)
```

```
require "libraryUtil".checkType("get_best_script", 1, str, "string")
str = mw.text.decode(str, true)

-- Search for the leading bytes that introduce the UTF-8 encoding of the
-- code points U+0580-U+10FFFF. If they are not found, the string can only
-- have characters from a left-to-right script, because the first code point
-- in a right-to-left script is U+0591, in the Hebrew block.
if not str:find "[\\214-\\244]" then
    return false
end

local result = false
local rtl = loader.scripts.rtl
for codepoint in mw.ustr.gcodepoint(str) do
    local script = lookup_script(codepoint)

    if rtl[script] then
        result = true
    elseif not (script == "Zyyy" or script == "Zinh"
                or script == "Zzzz") then
        return false
    end
end

return result
end

local function get_codepoint(args, arg)
    local codepoint_string = args[arg]
        or errorf(2, "Parameter %s is required", tostring(arg))
    local codepoint = tonumber(codepoint_string, 16)
        or errorf(2, "Parameter %s is not a code point in hexadecimal base",
        tostring(arg))
    if not (0 <= codepoint and codepoint <= 0x10FFFF) then
        errorf(2, "code point in parameter %s out of range", tostring(arg))
    end
    return codepoint
end

local function get_func(args, arg, prefix)
    local suffix = args[arg]
        or errorf(2, "Parameter %s is required", tostring(arg))
    suffix = mw.text.trim(suffix)
    local func_name = prefix .. suffix
    local func = p[func_name]
        or errorf(2, "There is no function '%s'", func_name)
    return func
end

-- This function allows any of the "lookup" functions to be invoked. The first
-- parameter is the word after "lookup_"; the second parameter is the code point
-- in hexadecimal base.
function p.lookup(frame)
    local func = get_func(frame.args, 1, "lookup_")
    local codepoint = get_codepoint(frame.args, 2)
    local result = func(codepoint)
    if func == p.lookup_name then
        -- Prevent code point labels such as <control-0000> from being
        -- interpreted as HTML tags.
        result = result:gsub("<", "&lt;")
    end
    return result
end
```



```
function p.is(frame)
  local func = get_func(frame.args, 1, "is_")

  -- is_Latin and is_valid_pagename take strings.
  if func == p.is_Latin or func == p.is_valid_pagename or func == p.is_rtl
    return (func(frame.args[2]))
  else -- The rest take code points.
    local codepoint = get_codepoint(frame.args, 2)
    return (func(codepoint)) -- Adjust to one result.
  end
end

end

return p
```



Modul:Unicode data/combining

Contains data used by [Module:Unicode data](#) to determine whether a character is combining or not. Can also be used to return the character's **combining class**. Generated from [DerivedCombiningClass.txt](#) using a [script](#).

```
local data = {
  singles = {
    [0x000315] = 232,
    [0x00031A] = 232,
    [0x00031B] = 216,
    [0x000345] = 240,
    [0x000346] = 230,
    [0x000357] = 230,
    [0x000358] = 232,
    [0x00035B] = 230,
    [0x00035C] = 233,
    [0x00035F] = 233,
    [0x000362] = 233,
    [0x000591] = 220,
    [0x000596] = 220,
    [0x00059A] = 222,
    [0x00059B] = 220,
    [0x0005AA] = 220,
    [0x0005AD] = 222,
    [0x0005AE] = 228,
    [0x0005AF] = 230,
    [0x0005B0] = 10,
    [0x0005B1] = 11,
    [0x0005B2] = 12,
    [0x0005B3] = 13,
    [0x0005B4] = 14,
    [0x0005B5] = 15,
    [0x0005B6] = 16,
    [0x0005B7] = 17,
    [0x0005B8] = 18,
    [0x0005BB] = 20,
    [0x0005BC] = 21,
    [0x0005BD] = 22,
    [0x0005BF] = 23,
    [0x0005C1] = 24,
    [0x0005C2] = 25,
    [0x0005C4] = 230,
    [0x0005C5] = 220,
    [0x0005C7] = 18,
    [0x000618] = 30,
    [0x000619] = 31,
    [0x00061A] = 32,
    [0x00064B] = 27,
    [0x00064C] = 28,
    [0x00064D] = 29,
    [0x00064E] = 30,
    [0x00064F] = 31,
    [0x000650] = 32,
    [0x000651] = 33,
    [0x000652] = 34,
    [0x00065C] = 220,
    [0x00065F] = 220,
    [0x000670] = 35,
```



[0x0006E3] = 220,
[0x0006E4] = 230,
[0x0006EA] = 220,
[0x0006ED] = 220,
[0x000711] = 36,
[0x000730] = 230,
[0x000731] = 220,
[0x000734] = 220,
[0x00073A] = 230,
[0x00073D] = 230,
[0x00073E] = 220,
[0x000742] = 220,
[0x000743] = 230,
[0x000744] = 220,
[0x000745] = 230,
[0x000746] = 220,
[0x000747] = 230,
[0x000748] = 220,
[0x0007F2] = 220,
[0x0007F3] = 230,
[0x0007FD] = 220,
[0x000898] = 230,
[0x0008E3] = 220,
[0x0008E6] = 220,
[0x0008E9] = 220,
[0x0008F0] = 27,
[0x0008F1] = 28,
[0x0008F2] = 29,
[0x0008F6] = 220,
[0x00093C] = 7,
[0x00094D] = 9,
[0x000951] = 230,
[0x000952] = 220,
[0x0009BC] = 7,
[0x0009CD] = 9,
[0x0009FE] = 230,
[0x000A3C] = 7,
[0x000A4D] = 9,
[0x000ABC] = 7,
[0x000ACD] = 9,
[0x000B3C] = 7,
[0x000B4D] = 9,
[0x000BCD] = 9,
[0x000C3C] = 7,
[0x000C4D] = 9,
[0x000C55] = 84,
[0x000C56] = 91,
[0x000CBC] = 7,
[0x000CCD] = 9,
[0x000D4D] = 9,
[0x000DCA] = 9,
[0x000E3A] = 9,
[0x000EBA] = 9,
[0x000F35] = 220,
[0x000F37] = 220,
[0x000F39] = 216,
[0x000F71] = 129,
[0x000F72] = 130,
[0x000F74] = 132,
[0x000F80] = 130,
[0x000F84] = 9,
[0x000FC6] = 220,
[0x001037] = 7,
[0x00108D] = 220,



[0x001714] = 9,
[0x001715] = 9,
[0x001734] = 9,
[0x0017D2] = 9,
[0x0017DD] = 230,
[0x0018A9] = 228,
[0x001939] = 222,
[0x00193A] = 230,
[0x00193B] = 220,
[0x001A17] = 230,
[0x001A18] = 220,
[0x001A60] = 9,
[0x001A7F] = 220,
[0x001ABD] = 220,
[0x001ACA] = 220,
[0x001B34] = 7,
[0x001B44] = 9,
[0x001B6B] = 230,
[0x001B6C] = 220,
[0x001BAA] = 9,
[0x001BAB] = 9,
[0x001BE6] = 7,
[0x001C37] = 7,
[0x001CD4] = 1,
[0x001CE0] = 230,
[0x001CED] = 220,
[0x001CF4] = 230,
[0x001DC2] = 220,
[0x001DCA] = 220,
[0x001DCD] = 234,
[0x001DCE] = 214,
[0x001DCF] = 220,
[0x001DD0] = 202,
[0x001DF6] = 232,
[0x001DF9] = 220,
[0x001DFA] = 218,
[0x001DFB] = 230,
[0x001DFC] = 233,
[0x001DFD] = 220,
[0x001DFE] = 230,
[0x001DFF] = 220,
[0x0020E1] = 230,
[0x0020E7] = 230,
[0x0020E8] = 220,
[0x0020E9] = 230,
[0x0020F0] = 230,
[0x002D7F] = 9,
[0x00302A] = 218,
[0x00302B] = 228,
[0x00302C] = 232,
[0x00302D] = 222,
[0x00A66F] = 230,
[0x00A806] = 9,
[0x00A82C] = 9,
[0x00A8C4] = 9,
[0x00A953] = 9,
[0x00A9B3] = 7,
[0x00A9C0] = 9,
[0x00AAB0] = 230,
[0x00AAB4] = 220,
[0x00AAC1] = 230,
[0x00AAF6] = 9,
[0x00ABED] = 9,
[0x00FB1E] = 26,



```
[0x0101FD] = 220,  
[0x0102E0] = 220,  
[0x010A0D] = 220,  
[0x010A0F] = 230,  
[0x010A38] = 230,  
[0x010A39] = 1,  
[0x010A3A] = 220,  
[0x010A3F] = 9,  
[0x010AE5] = 230,  
[0x010AE6] = 220,  
[0x010F4B] = 220,  
[0x010F4C] = 230,  
[0x010F82] = 230,  
[0x010F83] = 220,  
[0x010F84] = 230,  
[0x010F85] = 220,  
[0x011046] = 9,  
[0x011070] = 9,  
[0x01107F] = 9,  
[0x0110B9] = 9,  
[0x0110BA] = 7,  
[0x011173] = 7,  
[0x0111C0] = 9,  
[0x0111CA] = 7,  
[0x011235] = 9,  
[0x011236] = 7,  
[0x0112E9] = 7,  
[0x0112EA] = 9,  
[0x01134D] = 9,  
[0x011442] = 9,  
[0x011446] = 7,  
[0x01145E] = 230,  
[0x0114C2] = 9,  
[0x0114C3] = 7,  
[0x0115BF] = 9,  
[0x0115C0] = 7,  
[0x01163F] = 9,  
[0x0116B6] = 9,  
[0x0116B7] = 7,  
[0x01172B] = 9,  
[0x011839] = 9,  
[0x01183A] = 7,  
[0x01193D] = 9,  
[0x01193E] = 9,  
[0x011943] = 7,  
[0x0119E0] = 9,  
[0x011A34] = 9,  
[0x011A47] = 9,  
[0x011A99] = 9,  
[0x011C3F] = 9,  
[0x011D42] = 7,  
[0x011D97] = 9,  
[0x01BC9E] = 1,  
[0x01D16D] = 226,  
[0x01E2AE] = 230,  
[0x01E94A] = 7,  
};  
ranges = {  
  { 0x000300, 0x000314, 230 },  
  { 0x000316, 0x000319, 220 },  
  { 0x00031C, 0x000320, 220 },  
  { 0x000321, 0x000322, 202 },  
  { 0x000323, 0x000326, 220 },  
  { 0x000327, 0x000328, 202 },  
};
```



```
{ 0x000329, 0x000333, 220 },
{ 0x000334, 0x000338, 1 },
{ 0x000339, 0x00033C, 220 },
{ 0x00033D, 0x000344, 230 },
{ 0x000347, 0x000349, 220 },
{ 0x00034A, 0x00034C, 230 },
{ 0x00034D, 0x00034E, 220 },
{ 0x000350, 0x000352, 230 },
{ 0x000353, 0x000356, 220 },
{ 0x000359, 0x00035A, 220 },
{ 0x00035D, 0x00035E, 234 },
{ 0x000360, 0x000361, 234 },
{ 0x000363, 0x00036F, 230 },
{ 0x000483, 0x000487, 230 },
{ 0x000592, 0x000595, 230 },
{ 0x000597, 0x000599, 230 },
{ 0x00059C, 0x0005A1, 230 },
{ 0x0005A2, 0x0005A7, 220 },
{ 0x0005A8, 0x0005A9, 230 },
{ 0x0005AB, 0x0005AC, 230 },
{ 0x0005B9, 0x0005BA, 19 },
{ 0x000610, 0x000617, 230 },
{ 0x000653, 0x000654, 230 },
{ 0x000655, 0x000656, 220 },
{ 0x000657, 0x00065B, 230 },
{ 0x00065D, 0x00065E, 230 },
{ 0x0006D6, 0x0006DC, 230 },
{ 0x0006DF, 0x0006E2, 230 },
{ 0x0006E7, 0x0006E8, 230 },
{ 0x0006EB, 0x0006EC, 230 },
{ 0x000732, 0x000733, 230 },
{ 0x000735, 0x000736, 230 },
{ 0x000737, 0x000739, 220 },
{ 0x00073B, 0x00073C, 220 },
{ 0x00073F, 0x000741, 230 },
{ 0x000749, 0x00074A, 230 },
{ 0x0007EB, 0x0007F1, 230 },
{ 0x000816, 0x000819, 230 },
{ 0x00081B, 0x000823, 230 },
{ 0x000825, 0x000827, 230 },
{ 0x000829, 0x00082D, 230 },
{ 0x000859, 0x00085B, 220 },
{ 0x000899, 0x00089B, 220 },
{ 0x00089C, 0x00089F, 230 },
{ 0x0008CA, 0x0008CE, 230 },
{ 0x0008CF, 0x0008D3, 220 },
{ 0x0008D4, 0x0008E1, 230 },
{ 0x0008E4, 0x0008E5, 230 },
{ 0x0008E7, 0x0008E8, 230 },
{ 0x0008EA, 0x0008EC, 230 },
{ 0x0008ED, 0x0008EF, 220 },
{ 0x0008F3, 0x0008F5, 230 },
{ 0x0008F7, 0x0008F8, 230 },
{ 0x0008F9, 0x0008FA, 220 },
{ 0x0008FB, 0x0008FF, 230 },
{ 0x000953, 0x000954, 230 },
{ 0x000D3B, 0x000D3C, 9 },
{ 0x000E38, 0x000E39, 103 },
{ 0x000E48, 0x000E4B, 107 },
{ 0x000EB8, 0x000EB9, 118 },
{ 0x000EC8, 0x000ECB, 122 },
{ 0x000F18, 0x000F19, 220 },
{ 0x000F7A, 0x000F7D, 130 },
{ 0x000F82, 0x000F83, 230 },
```



```
{ 0x000F86, 0x000F87, 230 },
{ 0x001039, 0x00103A, 9 },
{ 0x00135D, 0x00135F, 230 },
{ 0x001A75, 0x001A7C, 230 },
{ 0x001AB0, 0x001AB4, 230 },
{ 0x001AB5, 0x001ABA, 220 },
{ 0x001ABB, 0x001ABC, 230 },
{ 0x001ABF, 0x001AC0, 220 },
{ 0x001AC1, 0x001AC2, 230 },
{ 0x001AC3, 0x001AC4, 220 },
{ 0x001AC5, 0x001AC9, 230 },
{ 0x001ACB, 0x001ACE, 230 },
{ 0x001B6D, 0x001B73, 230 },
{ 0x001BF2, 0x001BF3, 9 },
{ 0x001CD0, 0x001CD2, 230 },
{ 0x001CD5, 0x001CD9, 220 },
{ 0x001CDA, 0x001CDB, 230 },
{ 0x001CDC, 0x001CDF, 220 },
{ 0x001CE2, 0x001CE8, 1 },
{ 0x001CF8, 0x001CF9, 230 },
{ 0x001DC0, 0x001DC1, 230 },
{ 0x001DC3, 0x001DC9, 230 },
{ 0x001DCB, 0x001DCC, 230 },
{ 0x001DD1, 0x001DF5, 230 },
{ 0x001DF7, 0x001DF8, 228 },
{ 0x0020D0, 0x0020D1, 230 },
{ 0x0020D2, 0x0020D3, 1 },
{ 0x0020D4, 0x0020D7, 230 },
{ 0x0020D8, 0x0020DA, 1 },
{ 0x0020DB, 0x0020DC, 230 },
{ 0x0020E5, 0x0020E6, 1 },
{ 0x0020EA, 0x0020EB, 1 },
{ 0x0020EC, 0x0020EF, 220 },
{ 0x002CEF, 0x002CF1, 230 },
{ 0x002DE0, 0x002DFF, 230 },
{ 0x00302E, 0x00302F, 224 },
{ 0x003099, 0x00309A, 8 },
{ 0x00A674, 0x00A67D, 230 },
{ 0x00A69E, 0x00A69F, 230 },
{ 0x00A6F0, 0x00A6F1, 230 },
{ 0x00A8E0, 0x00A8F1, 230 },
{ 0x00A92B, 0x00A92D, 220 },
{ 0x00AAB2, 0x00AAB3, 230 },
{ 0x00AAB7, 0x00AAB8, 230 },
{ 0x00AABE, 0x00AABF, 230 },
{ 0x00FE20, 0x00FE26, 230 },
{ 0x00FE27, 0x00FE2D, 220 },
{ 0x00FE2E, 0x00FE2F, 230 },
{ 0x010376, 0x01037A, 230 },
{ 0x010D24, 0x010D27, 230 },
{ 0x010EAB, 0x010EAC, 230 },
{ 0x010F46, 0x010F47, 220 },
{ 0x010F48, 0x010F4A, 230 },
{ 0x010F4D, 0x010F50, 220 },
{ 0x011100, 0x011102, 230 },
{ 0x011133, 0x011134, 9 },
{ 0x01113B, 0x01113C, 7 },
{ 0x011366, 0x01136C, 230 },
{ 0x011370, 0x011374, 230 },
{ 0x011D44, 0x011D45, 9 },
{ 0x016AF0, 0x016AF4, 1 },
{ 0x016B30, 0x016B36, 230 },
{ 0x016FF0, 0x016FF1, 6 },
{ 0x01D165, 0x01D166, 216 },
```



```
        { 0x01D167, 0x01D169, 1 },
        { 0x01D16E, 0x01D172, 216 },
        { 0x01D17B, 0x01D182, 220 },
        { 0x01D185, 0x01D189, 230 },
        { 0x01D18A, 0x01D18B, 220 },
        { 0x01D1AA, 0x01D1AD, 230 },
        { 0x01D242, 0x01D244, 230 },
        { 0x01E000, 0x01E006, 230 },
        { 0x01E008, 0x01E018, 230 },
        { 0x01E01B, 0x01E021, 230 },
        { 0x01E023, 0x01E024, 230 },
        { 0x01E026, 0x01E02A, 230 },
        { 0x01E130, 0x01E136, 230 },
        { 0x01E2EC, 0x01E2EF, 230 },
        { 0x01E8D0, 0x01E8D6, 220 },
        { 0x01E944, 0x01E949, 230 },
    };
}

-- Needed for binary search.
data.ranges.length = #data.ranges

return data
```