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Modul:Color contrast

Vorlage:Lua

This module is used primarily by

- [Vorlage:TI](#)
- [Vorlage:TI / Vorlage:TI](#)
- [Vorlage:TI](#)
- [Vorlage:TI](#)
- [Vorlage:TI](#)
- [Vorlage:TI](#)

It is also used for tracking within

- [Module:Navbox](#)
- [Module:Userbox](#)
- [Module:Episode list](#)

and for documentation in

- [Module:College color](#)

The formulas used are [stated in WCAG 2.x specifications](#). **WCAG** is the main guideline for creating accessible interfaces on the web.

Usage

To use this module, you may use one of the above listed templates or invoke the module directly

- To compute relative luminescence:
`{{ColorToLum|color}}` or `{{#invoke:Color contrast|lum|color}}`
 - To compute a contrast ratio between two colors:
`{{Color contrast ratio|color1|color2|error=?}}` or `{{#invoke:Color contrast|ratio|color1|color2|error=?}}`
 - To determine which of two colors (color2a and color2b) has the greater contrast ratio with a particular color (color1):
`{{Greater color contrast ratio|color1|color2a|color2b}}` or `{{#invoke:Color contrast|greatercontrast|color1|color2a|color2b}}`
 - To compute the contrast ratio between the background and text colors specified in a css style string:
`{{#invoke:Color contrast|styleratio|css style statement string|default background color|default text color}}`
-



```
--
-- This module implements
-- {{Color contrast ratio}}
-- {{Greater color contrast ratio}}
-- {{ColorToLum}}
-- {{RGBColorToLum}}
--
local p = {}
local HTMLcolor = mw.loadData( 'Module:Color contrast/colors' )

local function sRGB (v)
    if (v <= 0.03928) then
        v = v / 12.92
    else
        v = math.pow((v+0.055)/1.055, 2.4)
    end
    return v
end

local function rgbdec2lum(R, G, B)
    if ( 0 <= R and R < 256 and 0 <= G and G < 256 and 0 <= B and B < 256 ) then
        return 0.2126 * sRGB(R/255) + 0.7152 * sRGB(G/255) + 0.0722 * sRGB(B/255)
    else
        return ''
    end
end

local function hsl2lum(h, s, l)
    if ( 0 <= h and h < 360 and 0 <= s and s <= 1 and 0 <= l and l <= 1 ) then
        local c = (1 - math.abs(2*l - 1))*s
        local x = c*(1 - math.fmod( math.fmod(h/60, 2) - 1) )
        local m = l - c/2

        local r, g, b = m, m, m
        if( 0 <= h and h < 60 ) then
            r = r + c
            g = g + x
        elseif( 60 <= h and h < 120 ) then
            r = r + x
            g = g + c
        elseif( 120 <= h and h < 180 ) then
            g = g + c
            b = b + x
        elseif( 180 <= h and h < 240 ) then
            g = g + x
            b = b + c
        elseif( 240 <= h and h < 300 ) then
            r = r + x
            b = b + c
        elseif( 300 <= h and h < 360 ) then
            r = r + c
            b = b + x
        end
        return rgbdec2lum(255*r, 255*g, 255*b)
    else
        return ''
    end
end

local function color2lum(c)
    if (c == nil) then
```

```
        return ''
    end

    -- html '#' entity
    c = c:gsub("&#35;", "#")

    -- whitespace
    c = c:match( '^%s*(.)[%s;]*$' )

    -- unstrip nowiki strip markers
    c = mw.text.unstripNoWiki(c)

    -- lowercase
    c = c:lower()

    -- first try to look it up
    local L = HTMLcolor[c]
    if (L ~= nil) then
        return L
    end

    -- convert from hsl
    if mw.usttring.match(c, '^hsl%([%s]*[0-9][0-9%.]*[%s]*,[%s]*[0-9][0-9%.]*%9
        local h, s, l = mw.usttring.match(c, '^hsl%([%s]*([0-9][0-9%.]*)[%s]*
        return hsl2lum(tonumber(h), tonumber(s)/100, tonumber(l)/100)
    end

    -- convert from rgb
    if mw.usttring.match(c, '^rgb%([%s]*[0-9][0-9]*[%s]*,[%s]*[0-9][0-9]*[%s]*
        local R, G, B = mw.usttring.match(c, '^rgb%([%s]*([0-9][0-9]*)[%s]*
        return rgbdec2lum(tonumber(R), tonumber(G), tonumber(B))
    end

    -- convert from rgb percent
    if mw.usttring.match(c, '^rgb%([%s]*[0-9][0-9%.]*%[%s]*,[%s]*[0-9][0-9%.]*
        local R, G, B = mw.usttring.match(c, '^rgb%([%s]*([0-9][0-9%.]*)%[%s]*
        return rgbdec2lum(255*tonumber(R)/100, 255*tonumber(G)/100, 255*
    end

    -- remove leading # (if there is one) and whitespace
    c = mw.usttring.match(c, '^[%s#]*([a-f0-9]*)[%s]*$')

    -- split into rgb
    local cs = mw.text.split(c or '', '')
    if( #cs == 6 ) then
        local R = 16*tonumber('0x' .. cs[1]) + tonumber('0x' .. cs[2])
        local G = 16*tonumber('0x' .. cs[3]) + tonumber('0x' .. cs[4])
        local B = 16*tonumber('0x' .. cs[5]) + tonumber('0x' .. cs[6])

        return rgbdec2lum(R, G, B)
    elseif ( #cs == 3 ) then
        local R = 16*tonumber('0x' .. cs[1]) + tonumber('0x' .. cs[1])
        local G = 16*tonumber('0x' .. cs[2]) + tonumber('0x' .. cs[2])
        local B = 16*tonumber('0x' .. cs[3]) + tonumber('0x' .. cs[3])

        return rgbdec2lum(R, G, B)
    end

    -- failure, return blank
    return ''
end

-- This exports the function for use in other modules.
-- The colour is passed as a string.
```



```
function p._lum(color)
    return color2lum(color)
end

function p._greatercontrast(args)
    local bias = tonumber(args['bias'] or '0') or 0
    local css = (args['css'] and args['css'] ~= '') and true or false
    local v1 = color2lum(args[1] or '')
    local c2 = args[2] or '#FFFFFF'
    local v2 = color2lum(c2)
    local c3 = args[3] or '#000000'
    local v3 = color2lum(c3)
    local ratio1 = -1;
    local ratio2 = -1;
    if (type(v1) == 'number' and type(v2) == 'number') then
        ratio1 = (v2 + 0.05)/(v1 + 0.05)
        ratio1 = (ratio1 < 1) and 1/ratio1 or ratio1
    end
    if (type(v1) == 'number' and type(v3) == 'number') then
        ratio2 = (v3 + 0.05)/(v1 + 0.05)
        ratio2 = (ratio2 < 1) and 1/ratio2 or ratio2
    end

    if css then
        local c1 = args[1] or ''
        if mw.ustring.match(c1, '^[A-Fa-f0-9][A-Fa-f0-9][A-Fa-f0-9]$') or
            mw.ustring.match(c1, '^[A-Fa-f0-9][A-Fa-f0-9][A-Fa-f0-9]')
            c1 = '#' .. c1
        end
        if mw.ustring.match(c2, '^[A-Fa-f0-9][A-Fa-f0-9][A-Fa-f0-9]$') or
            mw.ustring.match(c2, '^[A-Fa-f0-9][A-Fa-f0-9][A-Fa-f0-9]')
            c2 = '#' .. c2
        end
        if mw.ustring.match(v3, '^[A-Fa-f0-9][A-Fa-f0-9][A-Fa-f0-9]$') or
            mw.ustring.match(v3, '^[A-Fa-f0-9][A-Fa-f0-9][A-Fa-f0-9]')
            c3 = '#' .. c3
        end
        return 'background-color:' .. c1 .. '; color:' .. ((ratio1 > 0) and
    end

    return (ratio1 > 0) and (ratio2 > 0) and ((ratio1 + bias > ratio2) and c2
end

function p._ratio(args)
    local v1 = color2lum(args[1])
    local v2 = color2lum(args[2])
    if (type(v1) == 'number' and type(v2) == 'number') then
        -- v1 should be the brighter of the two.
        if v2 > v1 then
            v1, v2 = v2, v1
        end
        return (v1 + 0.05)/(v2 + 0.05)
    else
        return args['error'] or '?'
    end
end

function p._styleratio(args)
    local style = (args[1] or ''):lower()
    local bg, fg = 'white', 'black'
    local lum_bg, lum_fg = 1, 0

    if args[2] then
        local lum = color2lum(args[2])
```

```
        if lum ~= '' then bg, lum_bg = args[2], lum end
    end
    if args[3] then
        local lum = color2lum(args[3])
        if lum ~= '' then fg, lum_fg = args[3], lum end
    end

    local slist = mw.text.split(mw.ustring.gsub(mw.ustring.gsub(style or '',
for k = 1,#slist do
    local s = slist[k]
    local k,v = s:match( '^[%s]*([^:]-):([^:]-)[%s;]*$' )
    k = k or ''
    v = v or ''
    if (k:match('^[%s]*(background)[%s]*$') or k:match('^[%s]*(backgr
        local lum = color2lum(v)
        if( lum ~= '' ) then bg, lum_bg = v, lum end
    elseif (k:match('^[%s]*(color)[%s]*$')) then
        local lum = color2lum(v)
        if( lum ~= '' ) then bg, lum_fg = v, lum end
    end
end
if lum_bg > lum_fg then
    return (lum_bg + 0.05)/(lum_fg + 0.05)
else
    return (lum_fg + 0.05)/(lum_bg + 0.05)
end
end

--[[
Use {{#invoke:Color contrast|somecolor}} directly or
{{#invoke:Color contrast}} from a wrapper template.

Parameters:
-- |1=          - required; A color to check.
--]]
function p.lum(frame)
    local color = frame.args[1] or frame:getParent().args[1]
    return p._lum(color)
end

function p.ratio(frame)
    local args = frame.args[1] and frame.args or frame:getParent().args
    return p._ratio(args)
end

function p.styleratio(frame)
    local args = frame.args[1] and frame.args or frame:getParent().args
    return p._styleratio(args)
end

function p.greatercontrast(frame)
    local args = frame.args[1] and frame.args or frame:getParent().args
    return p._greatercontrast(args)
end

return p
```

Modul:Navbar

Vorlage:Lua Vorlage:Uses TemplateStyles Vorlage:Lua sidebar

This module implements the [Vorlage:TI](#) template. Please see the [template page](#) for usage instructions.

Tracking/maintenance categories

- [Vorlage:Clc](#)
- [Vorlage:Clc](#)
- [Vorlage:Clc](#)
- [Vorlage:Clc](#)
- [Vorlage:Clc](#)

```
local p = {}
local navbar = require('Module:Navbar')._navbar
local cfg = mw.loadData('Module:Navbar/configuration')
local getArgs -- lazily initialized
local args
local format = string.format

local function striped(wikitext, border)
    -- Return wikitext with markers replaced for odd/even striping.
    -- Child (subgroup) navboxes are flagged with a category that is removed
    -- by parent navboxes. The result is that the category shows all pages
    -- where a child navbox is not contained in a parent navbox.
    local orphanCat = cfg.category.orphan
    if border == cfg.keyword.border_subgroup and args[cfg.arg.orphan] ~= cfg
        -- No change; striping occurs in outermost navbox.
        return wikitext .. orphanCat
    end
    local first, second = cfg.class.navbox_odd_part, cfg.class.navbox_even_part
    if args[cfg.arg.evenodd] then
        if args[cfg.arg.evenodd] == cfg.keyword.evenodd_swap then
            first, second = second, first
        else
            first = args[cfg.arg.evenodd]
            second = first
        end
    end
    local changer
    if first == second then
        changer = first
    else
        local index = 0
        changer = function (code)
            if code == '0' then
                -- Current occurrence is for a group before a new
                -- Set it to first as a valid although pointless
                -- The next occurrence will be the first row after
                -- in a subgroup and will also be first.
                index = 0
                return first
            end
        end
    end
end
```

```
                index = index + 1
                return index % 2 == 1 and first or second
            end
        end
        local regex = orphanCat:gsub('([%[%]])', '%%%1')
        return (wikitext:gsub(regex, ')):gsub(cfg.marker.regex, changer) -- ()
    end

local function processItem(item, nowrapitems)
    if item:sub(1, 2) == '{|' then
        -- Applying nowrap to lines in a table does not make sense.
        -- Add newlines to compensate for trim of x in |parm=x in a temp
        return '\n' .. item .. '\n'
    end
    if nowrapitems == cfg.keyword.nowrapitems_yes then
        local lines = {}
        for line in (item .. '\n'):gmatch('([^\n]*)\n') do
            local prefix, content = line:match('^([*;;#]+)%s*(.*)')
            if prefix and not content:match(cfg.pattern.nowrap) then
                line = format(cfg.nowrap_item, prefix, content)
            end
            table.insert(lines, line)
        end
        item = table.concat(lines, '\n')
    end
    if item:match('^[*;;#]') then
        return '\n' .. item .. '\n'
    end
    return item
end

-- we will want this later when we want to add tstyles for hlist/plainlist
local function has_navbar()
    return args[cfg.arg.navbar] ~= cfg.keyword.navbar_off
        and args[cfg.arg.navbar] ~= cfg.keyword.navbar_plain
        and (
            args[cfg.arg.name]
            or mw.getCurrentFrame():getParent():getTitle():gsub(cfg.p
                ~= cfg.pattern.navbox
        )
end

local function renderNavBar(titleCell)
    if has_navbar() then
        titleCell:wikitext(navbar{
            [cfg.navbar.name] = args[cfg.arg.name],
            [cfg.navbar.mini] = 1,
            [cfg.navbar.fontstyle] = (args[cfg.arg.basestyle] or '')
                (args[cfg.arg.titlestyle] or '') ..
                ';background:none transparent;border:none;box-sha
        })
    end
end

local function renderTitleRow(tbl)
    if not args[cfg.arg.title] then return end

    local titleRow = tbl:tag('tr')

    local titleCell = titleRow:tag('th'):attr('scope', 'col')

    local titleColspan = 2
    if args[cfg.arg.imageleft] then titleColspan = titleColspan + 1 end
end
```

```
    if args[cfg.arg.image] then titleColspan = titleColspan + 1 end

    titleCell
      :cssText(args[cfg.arg.basestyle])
      :cssText(args[cfg.arg.titlestyle])
      :addClass(cfg.class.navbox_title)
      :attr('colspan', titleColspan)

    renderNavBar(titleCell)

    titleCell
      :tag('div')
      -- id for aria-labelledby attribute
      :attr('id', mw.uri.anchorEncode(args[cfg.arg.title]))
      :addClass(args[cfg.arg.titleclass])
      :css('font-size', '114%')
      :css('margin', '0 4em')
      :wikitext(processItem(args[cfg.arg.title]))
end

local function getAboveBelowColspan()
  local ret = 2
  if args[cfg.arg.imageleft] then ret = ret + 1 end
  if args[cfg.arg.image] then ret = ret + 1 end
  return ret
end

local function renderAboveRow(tbl)
  if not args[cfg.arg.above] then return end

  tbl:tag('tr')
    :tag('td')
      :addClass(cfg.class.navbox_abovebelow)
      :addClass(args[cfg.arg.aboveclass])
      :cssText(args[cfg.arg.basestyle])
      :cssText(args[cfg.arg.abovestyle])
      :attr('colspan', getAboveBelowColspan())
      :tag('div')
      -- id for aria-labelledby attribute, if no title
      :attr('id', args[cfg.arg.title] and nil or mw.uri)
      :wikitext(processItem(args[cfg.arg.above], args[

end

local function renderBelowRow(tbl)
  if not args[cfg.arg.below] then return end

  tbl:tag('tr')
    :tag('td')
      :addClass(cfg.class.navbox_abovebelow)
      :addClass(args[cfg.arg.belowclass])
      :cssText(args[cfg.arg.basestyle])
      :cssText(args[cfg.arg.belowstyle])
      :attr('colspan', getAboveBelowColspan())
      :tag('div')
      :wikitext(processItem(args[cfg.arg.below], args[

end

local function renderListRow(tbl, index, listnum, listnums_size)
  local row = tbl:tag('tr')

  if index == 1 and args[cfg.arg.imageleft] then
    row
      :tag('td')
        :addClass(cfg.class.noviewer)
```

```
                :addClass(cfg.class.navbox_image)
                :addClass(args[cfg.arg.imageclass])
                :css('width', '1px') -- Minimize width
                :css('padding', '0 2px 0 0')
                :cssText(args[cfg.arg.imageleftstyle])
                :attr('rowspan', listnums_size)
                :tag('div')
                :wikitext(processItem(args[cfg.arg.image]))
end

local group_and_num = format(cfg.arg.group_and_num, listnum)
local groupstyle_and_num = format(cfg.arg.groupstyle_and_num, listnum)
if args[group_and_num] then
    local groupCell = row:tag('th')

    -- id for aria-labelledby attribute, if lone group with no title
    if listnum == 1 and not (args[cfg.arg.title] or args[cfg.arg.above])
        groupCell
            :attr('id', mw.uri.anchorEncode(args[cfg.arg.group_and_num]))
    end

    groupCell
        :attr('scope', 'row')
        :addClass(cfg.class.navbox_group)
        :addClass(args[cfg.arg.groupclass])
        :cssText(args[cfg.arg.basestyle])
        -- If groupwidth not specified, minimize width
        :css('width', args[cfg.arg.groupwidth] or '1%')

    groupCell
        :cssText(args[cfg.arg.groupstyle])
        :cssText(args[groupstyle_and_num])
        :wikitext(args[group_and_num])
end

local listCell = row:tag('td')

if args[group_and_num] then
    listCell
        :addClass(cfg.class.navbox_list_with_group)
else
    listCell:attr('colspan', 2)
end

if not args[cfg.arg.groupwidth] then
    listCell:css('width', '100%')
end

local rowstyle -- usually nil so cssText(rowstyle) usually adds nothing
if index % 2 == 1 then
    rowstyle = args[cfg.arg.oddstyle]
else
    rowstyle = args[cfg.arg.evenstyle]
end

local list_and_num = format(cfg.arg.list_and_num, listnum)
local listText = args[list_and_num]
local oddEven = cfg.marker.oddeven
if listText:sub(1, 12) == '</div><table' then
    -- Assume list text is for a subgroup navbox so no automatic stripping
    oddEven = listText:find(cfg.pattern.navbox_title) and cfg.marker
end

local liststyle_and_num = format(cfg.arg.liststyle_and_num, listnum)
```

```
local listclass_and_num = format(cfg.arg.listclass_and_num, listnum)
listCell
    :css('padding', '0')
    :cssText(args[cfg.arg.liststyle])
    :cssText(rowstyle)
    :cssText(args[liststyle_and_num])
    :addClass(cfg.class.navbox_list)
    :addClass(cfg.class.navbox_part .. oddEven)
    :addClass(args[cfg.arg.listclass])
    :addClass(args[listclass_and_num])
    :tag('div')
        :css('padding',
            (index == 1 and args[cfg.arg.listlpadding]) or a
        )
        :wikitext(processItem(listText, args[cfg.arg.nowrapitems]
end
if index == 1 and args[cfg.arg.image] then
    row
        :tag('td')
            :addClass(cfg.class.noviewer)
            :addClass(cfg.class.navbox_image)
            :addClass(args[cfg.arg.imageclass])
            :css('width', '1px') -- Minimize width
            :css('padding', '0 0 0 2px')
            :cssText(args[cfg.arg.imagestyle])
            :attr('rowspan', listnums_size)
            :tag('div')
                :wikitext(processItem(args[cfg.arg.image]
        end
    end
end

-- uses this now to make the needHlistCategory correct
-- to use later for when we add list styles via navbox
local function has_list_class(htmlclass)
    local class_args = { -- rough order of probability of use
        cfg.arg.bodyclass, cfg.arg.listclass, cfg.arg.aboveclass,
        cfg.arg.belowclass, cfg.arg.titleclass, cfg.arg.navboxclass,
        cfg.arg.groupclass, cfg.arg.imageclass
    }
    local patterns = {
        '^' .. htmlclass .. '$',
        '%s' .. htmlclass .. '$',
        '^' .. htmlclass .. '%s',
        '%s' .. htmlclass .. '%s'
    }
    for _, arg in ipairs(class_args) do
        for _, pattern in ipairs(patterns) do
            if mw.ustring.find(args[arg] or '', pattern) then
                return true
            end
        end
    end
    return false
end

local function needsHorizontalLists(border)
    if border == cfg.keyword.border_subgroup or args[cfg.arg.tracking] == cfg
    end
    return not has_list_class(cfg.pattern.hlist) and not has_list_class(cfg.p
end

local function hasBackgroundColors()
```

```
        for _, key in ipairs({cfg.arg.titlestyle, cfg.arg.groupstyle,
            cfg.arg.basestyle, cfg.arg.abovestyle, cfg.arg.belowstyle}) do
            if tostring(args[key]):find('background', 1, true) then
                return true
            end
        end
    end
    return false
end

local function hasBorders()
    for _, key in ipairs({cfg.arg.groupstyle, cfg.arg.basestyle,
        cfg.arg.abovestyle, cfg.arg.belowstyle}) do
        if tostring(args[key]):find('border', 1, true) then
            return true
        end
    end
    return false
end

local function isIllegible()
    local stycleratio = require('Module:Color contrast')._stycleratio
    for key, style in pairs(args) do
        if tostring(key):match(cfg.pattern.style) then
            if stycleratio{mw.text.unstripNowiki(style)} < 4.5 then
                return true
            end
        end
    end
    return false
end

local function getTrackingCategories(border)
    local cats = {}
    if needsHorizontalLists(border) then table.insert(cats, cfg.category.horizontal)
    if hasBackgroundColors() then table.insert(cats, cfg.category.background)
    if isIllegible() then table.insert(cats, cfg.category.illegible) end
    if hasBorders() then table.insert(cats, cfg.category.borders) end
    return cats
end

local function renderTrackingCategories(builder, border)
    local title = mw.title.getCurrentTitle()
    if title.namespace ~= 10 then return end -- not in template space
    local subpage = title.subpageText
    if subpage == cfg.keyword.subpage_doc or subpage == cfg.keyword.subpage_s
        or subpage == cfg.keyword.subpage_testcases then return end

    for _, cat in ipairs(getTrackingCategories(border)) do
        builder:wikitext('[[Category:' .. cat .. ']]')
    end
end

local function renderMainTable(border, listnums)
    local tbl = mw.html.create('table')
        :addClass(cfg.class.nowraplinks)
        :addClass(args[cfg.arg.bodyclass])

    local state = args[cfg.arg.state]
    if args[cfg.arg.title] and state ~= cfg.keyword.state_plain and state ~=
        if state == cfg.keyword.state_collapsed then
            state = cfg.class.collapsed
        end
    end
    tbl
        :addClass(cfg.class.collapsible)
```

```

        :addClass(state or cfg.class.autocollapse)
    end

tbl:css('border-spacing', 0)
if border == cfg.keyword.border_subgroup or border == cfg.keyword.border_
    tbl
        :addClass(cfg.class.navbox_subgroup)
        :cssText(args[cfg.arg.bodystyle])
        :cssText(args[cfg.arg.style])
    else -- regular navbox - bodystyle and style will be applied to the wrap
        tbl
            :addClass(cfg.class.navbox_inner)
            :css('background', 'transparent')
            :css('color', 'inherit')
        end
    tbl:cssText(args[cfg.arg.innerstyle])

    renderTitleRow(tbl)
    renderAboveRow(tbl)
    local listnums_size = #listnums
    for i, listnum in ipairs(listnums) do
        renderListRow(tbl, i, listnum, listnums_size)
    end
    renderBelowRow(tbl)

    return tbl
end

local function add_navbox_styles()
    local frame = mw.getCurrentFrame()
    -- This is a lambda so that it doesn't need the frame as a parameter
    local function add_user_styles(templatestyles)
        if templatestyles and templatestyles ~= '' then
            return frame:extensionTag{
                name = 'templatestyles', args = { src = templatestyles }
            }
        end
        return ''
    end
end

-- get templatestyles. load base from config so that Lua only needs to do
-- the work once of parser tag expansion
local base_templatestyles = cfg.templatestyles
local templatestyles = add_user_styles(args[cfg.arg.templatestyles])
local child_templatestyles = add_user_styles(args[cfg.arg.child_templates])

-- The 'navbox-styles' div exists for two reasons:
-- 1. To wrap the styles to work around T200206 more elegantly. Instead
-- of combinatorial rules, this ends up being linear number of CSS ru
-- 2. To allow MobileFrontend to rip the styles out with 'nomobile' such
-- they are not dumped into the mobile view.
return mw.html.create('div')
        :addClass(cfg.class.navbox_styles)
        :addClass(cfg.class.nomobile)
        :wikitext(base_templatestyles .. templatestyles .. child_templatestyles)
        :done()
end

function p._navbox(navboxArgs)
    args = navboxArgs
    local listnums = {}

    for k, _ in pairs(args) do
        if type(k) == 'string' then

```

```
                local listnum = k:match(cfg.pattern.listnum)
                if listnum then table.insert(listnums, tonumber(listnum))
            end
        end
    end
    table.sort(listnums)

    local border = mw.text.trim(args[cfg.arg.border] or args[1] or '')
    if border == cfg.keyword.border_child then
        border = cfg.keyword.border_subgroup
    end

    -- render the main body of the navbox
    local tbl = renderMainTable(border, listnums)

    local res = mw.html.create()
    -- render the appropriate wrapper for the navbox, based on the border pa

    if border == cfg.keyword.border_none then
        res:node(add_navbox_styles())
        local nav = res:tag('div')
            :attr('role', 'navigation')
            :node(tbl)
        -- aria-labelledby title, otherwise above, otherwise lone group
        if args[cfg.arg.title] or args[cfg.arg.above] or (args[cfg.arg.group1]
            and not args[cfg.arg.group2]) then
            nav:attr(
                'aria-labelledby',
                mw.uri.anchorEncode(
                    args[cfg.arg.title] or args[cfg.arg.above]
                )
            )
        else
            nav:attr('aria-label', cfg.aria_label)
        end
    elseif border == cfg.keyword.border_subgroup then
        -- We assume that this navbox is being rendered in a list cell of
        -- parent navbox, and is therefore inside a div with padding:0em
        -- We start with a </div> to avoid the padding being applied, and
        -- end add a <div> to balance out the parent's </div>
        res
            :wikitext('</div>')
            :node(tbl)
            :wikitext('<div>')
    else
        res:node(add_navbox_styles())
        local nav = res:tag('div')
            :attr('role', 'navigation')
            :addClass(cfg.class.navbox)
            :addClass(args[cfg.arg.navboxclass])
            :cssText(args[cfg.arg.bodystyle])
            :cssText(args[cfg.arg.style])
            :css('padding', '3px')
            :node(tbl)
        -- aria-labelledby title, otherwise above, otherwise lone group
        if args[cfg.arg.title] or args[cfg.arg.above]
            or (args[cfg.arg.group1] and not args[cfg.arg.group2]) then
            nav:attr(
                'aria-labelledby',
                mw.uri.anchorEncode(args[cfg.arg.title] or args[
            )
        else
            nav:attr('aria-label', cfg.aria_label)
        end
    end
end
```

```
        if (args[cfg.arg.nocat] or cfg.keyword.nocat_false):lower() == cfg.keyword
            renderTrackingCategories(res, border)
        end
        return striped(tostring(res), border)
    end

function p.navbox(frame)
    if not getArgs then
        getArgs = require('Module:Arguments').getArgs
    end
    args = getArgs(frame, {wrappers = {cfg.pattern.navbox}})

    -- Read the arguments in the order they'll be output in, to make referenc
    -- number in the right order.
    local
        _ = args[cfg.arg.title]
        _ = args[cfg.arg.above]
    -- Limit this to 20 as covering 'most' cases (that's a SWAG) and because
    -- iterator approach won't work here
    for i = 1, 20 do
        _ = args[format(cfg.arg.group_and_num, i)]
        _ = args[format(cfg.arg.list_and_num, i)]
    end
    _ = args[cfg.arg.below]

    return p._navbox(args)
end

return p
```