

Toggle menu  
Blue Gold Program Wiki

## Navigation

- [Main page](#)
- [Recent changes](#)
- [Random page](#)
- [Help about MediaWiki](#)

## Tools

- [What links here](#)
- [Related changes](#)
- [Special pages](#)
- [Permanent link](#)
- [Page information](#)

## Personal tools

- [Log in](#)

## personal-extra

Toggle search

Search

Random page

## Views

- [View](#)
- [View source](#)
- [History](#)
- [PDF Export](#)

## Actions

# Module:Color contrast

From Blue Gold Program Wiki

The printable version is no longer supported and may have rendering errors. Please update your browser bookmarks and please use the default browser print function instead.

This module is rated as [ready for general use](#). It has reached a mature form and is thought to be bug-free and ready for use wherever appropriate. It is ready to mention on help pages and other Wikipedia resources as an option for new users to learn. To reduce server load and bad output, it should be improved by [sandbox testing](#) rather than repeated trial-and-error editing.

[40x40px](#)

This module is [subject to page protection](#). It is a [highly visible module](#) in use by a very large number of pages, or is [substituted](#) very frequently. Because vandalism or mistakes would affect many pages, and even trivial editing might cause substantial load on the servers, it is [protected](#) from editing.

**This Lua module is used on [approximately 371,000 pages, or roughly 20819% of all pages](#).**

To avoid major disruption and server load, any changes should be tested in the module's [/sandbox](#) or [/testcases](#) subpages, or in your own [module sandbox](#). The tested changes can be added to this page in a single edit. Consider discussing changes on the [talk page](#) before implementing them.

This module depends on the following other modules:

- [Module:Color contrast/colors](#)

This module is used primarily by

```
{{Color contrast ratio}}
{{ColorToLum}} / {{RGBColorToLum}}
{{Color contrast conformance}}
{{Ensure AAA contrast ratio}}
{{Ensure AA contrast ratio}}
{{Greater color contrast ratio}}
```

It is also used for tracking within

[Module:Navbar](#)  
[Module:Userbox](#)  
[Module:Episode list](#)

and for documentation in

[Module:College color](#)

## 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.abs( 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.ustring.match(c, '^hsl%([%s]*[0-9][0-9%.]*[%s]*,[%s]*[0-9][0-9%.]*%%[%s]*,[

```

```

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

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

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

            -- remove leading # (if there is one) and whitespace
            c = mw.ustring.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
        end
    end

```

```

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-Za-z0-9][-A-Za-z0-9][-A-Za-z0-9]$') or
            mw.ustring.match(c1, '^[-A-Za-z0-9][-A-Za-z0-9][-A-Za-z0-9][-A-Za-z0-9][-A-Za-z0-9]$') then
            c1 = '#' .. c1
        end
        if mw.ustring.match(c2, '^[-A-Za-z0-9][-A-Za-z0-9][-A-Za-z0-9]$') or
            mw.ustring.match(c2, '^[-A-Za-z0-9][-A-Za-z0-9][-A-Za-z0-9][-A-Za-z0-9][-A-Za-z0-9]$') then
            c2 = '#' .. c2
        end
        if mw.ustring.match(v3, '^[-A-Za-z0-9][-A-Za-z0-9][-A-Za-z0-9]$') or
            mw.ustring.match(v3, '^[-A-Za-z0-9][-A-Za-z0-9][-A-Za-z0-9][-A-Za-z0-9][-A-Za-z0-9]$') then
            c3 = '#' .. c3
        end
    end
end

```

```

        return 'background-color:' .. c1 .. '; color:' .. ((ratio1 >
0) and (ratio2 > 0) and ((ratio1 + bias > ratio2) and c2 or c3) or '') .. ';
end

```

```

        return (ratio1 > 0) and (ratio2 > 0) and ((ratio1 + bias > ratio2)
and c2 or c3) or ''
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
'', '&#x23;', '#'), '&#35;', '#'), ';')
    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]*(background%-color)[%s]*$')) then
            local lum = color2lum(v)
            if( lum ~= '' ) then bg, lum_bg = v, lum end
        elseif (k:match('^[%s]*(color)[%s]*$')) then
            local lum = color2lum(v)
            if( lum ~= '' ) then bg, lum_fg = v, lum end
        end
    end

```

```

        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
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

```

Retrieved from "[https://www.bluegoldwiki.com/index.php?title=Module:Color\\_contrast&oldid=1828](https://www.bluegoldwiki.com/index.php?title=Module:Color_contrast&oldid=1828)"

## Namespaces

- [Module](#)
- [Discussion](#)

## Variants

### Categories:

- [Pages with script errors](#)
- [Pages with broken file links](#)
- [Modules for general use](#)



- [Modules subject to page protection](#)

This page was last edited on 19 February 2020, at 09:52.

## Blue Gold Program Wiki

The wiki version of the Lessons Learnt Report of the Blue Gold program, documents the experiences of a technical assistance (TA) team working in a development project implemented by the Bangladesh Water Development Board (BWDB) and the Department of Agricultural Extension (DAE) over an eight+ year period from March 2013 to December 2021. The wiki lessons learnt report (LLR) is intended to complement the BWDB and DAE project completion reports (PCRs), with the aim of recording lessons learnt for use in the design and implementation of future interventions in the coastal zone.

- [Privacy policy](#)
- [About Blue Gold Program Wiki](#)
- [Disclaimers](#)

Developed and maintained by Big Blue Communications for Blue Gold Program



[Blue Gold Program Wiki](#)