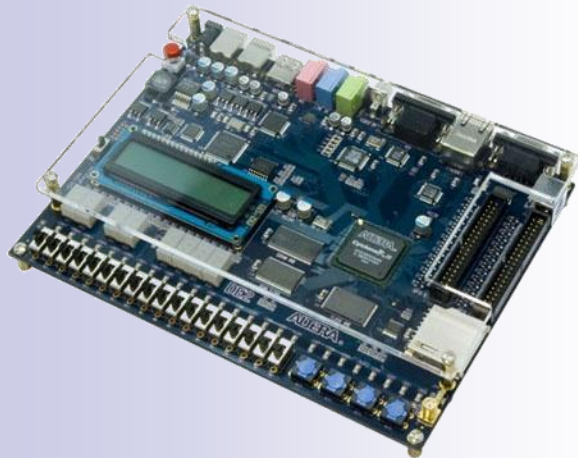# Logic Systems and Processors
cz:Logické systémy a procesory

Lecturer: Richard Šusta

richard@susta.cz, susta@fel.cvut.cz,
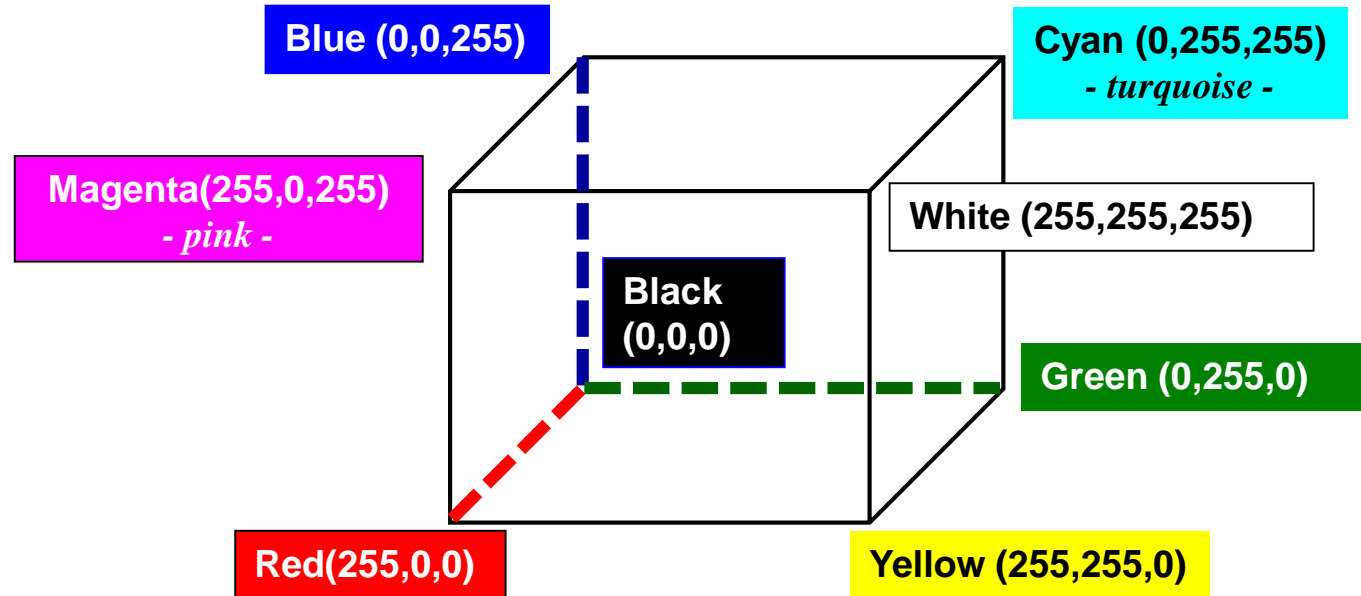+420 2 2435 **7359**

Version V1.0

COLORS

Reality vs. palette

Blue (0,0,255)

Cyan (0,255,255)
- *turquoise* -

Magenta(255,0,255)
- *pink* -

White (255,255,255)

Black (0,0,0)

Green (0,255,0)

Red(255,0,0)

Yellow (255,255,0)

- *Additive colour mixing is used, for example, on LCD monitors. Colours are added because their components behave like **light sources**.*

21.10.2024

- *Printing applies **subtractive colour mixing**
- the effects of individual colours are subtracted as each component acts as a white light filter.*

- *The CMY color cube is obtained by switching the opposite vertices of the RGB cube,
i.e. black to white, yellow to blue, etc..*

$$
\begin{array}{c} \text{Cyan} \\ \text{Magenta} \\ \text{Yellow} \end{array}
\begin{bmatrix} C \\ M \\ Y \end{bmatrix}
=
\begin{bmatrix} 255 \\ 255 \\ 255 \end{bmatrix}
-
\begin{bmatrix} R \\ G \\ B \end{bmatrix}
$$

- *The shared blacK (cheaper colour) is updated to CMYK:*
$K = min(C,M,Y); \; C=C-K; \; M=M-K; \; Y=Y-K;$

gamut = subset of colours

human eye

RGB
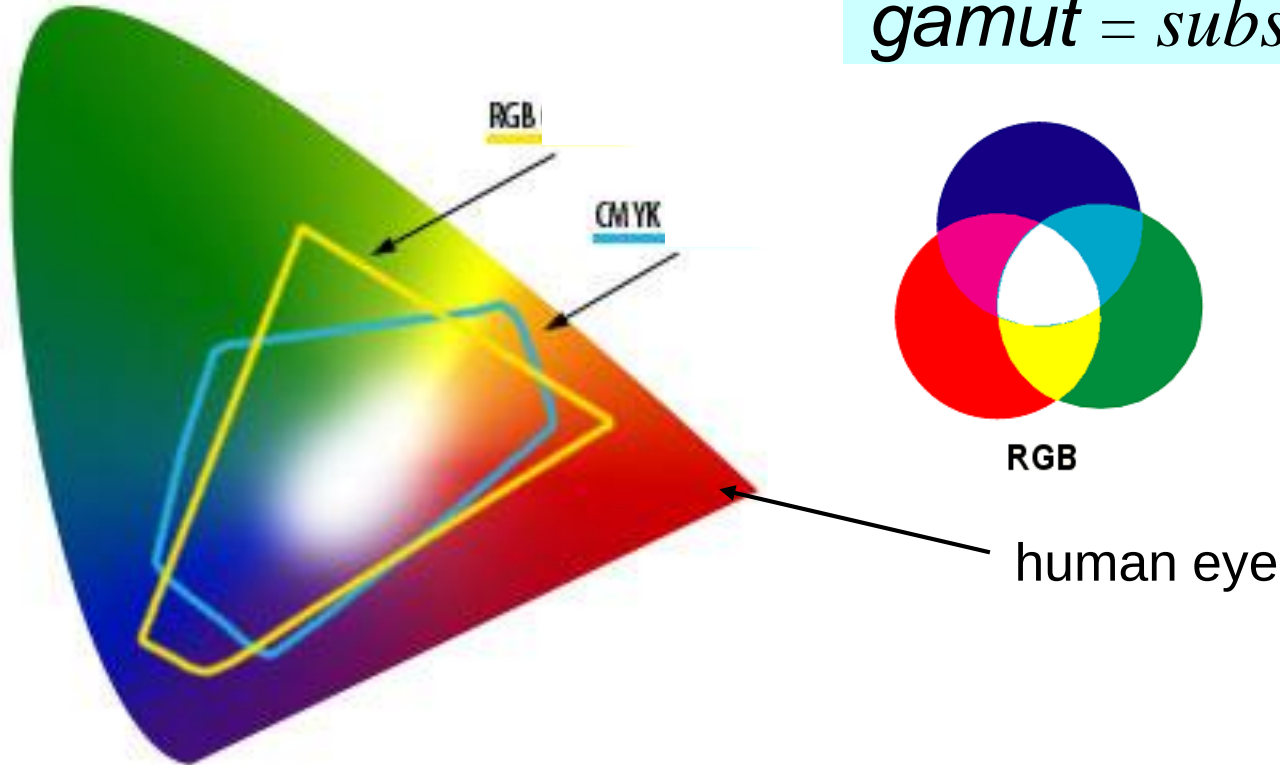
CMYK

- *CMYK has a different **gamut** than RGB, so some RGB colours cannot be printed on conventional printers and some CMYK colours do not appear on RGB monitors!*
- *And you will only see many shades of colour in nature.*

NAMES OF COLORS ISCC–NBS

Inter-Society Color Council (ISCC) - National Bureau of Standards (NBS)

[Image: color-meanings.com]   6

16 color + .NET colors equivalent Unix X11

16 Colors Windows Palette

Black	Maroon
000000	800000

Gray	Red
808080	FF0000

Navy	Purple
000080	800080

Blue	Fuchsia
0000FF	FFFFFF

Green	Olive
008000	808000

Lime	Yellow
00FF00	FFFF00

Teal	Silver
008080	C0C0C0

Aqua	White
00FFFF	FFFFFF

Color	Hex	Color	Hex	Color	Hex	Color	Hex
AliceBlue	#FFF0F8FF	DarkTurquoise	#FF00CED1	LightSeaGreen	#FF20B2AA	PapayaWhip	#FFFFEFD5
AntiqueWhite	#FFFAEBD7	DarkViolet	#FF9400D3	LightSkyBlue	#FF87CEFA	PeachPuff	#FFFFDAB9
Aqua	#FF00FFFF	DeepPink	#FFFF1493	LightSlateGray	#FF778899	Peru	#FFCD853F
Aquamarine	#FF7FFFD4	DeepSkyBlue	#FF00BFFF	LightSteelBlue	#FFB0C4DE	Pink	#FFFFC0CB
Azure	#FFF0FFFF	DimGray	#FF696969	LightYellow	#FFFFFFE0	Plum	#FFDDA0DD
Beige	#FFF5F5DC	DodgerBlue	#FF1E90FF	Lime	#FF00FF00	PowderBlue	#FFB0E0E6
Bisque	#FFFFE4C4	Firebrick	#FFB22222	LimeGreen	#FF32CD32	Purple	#FF800080
Black	#FF000000	FloralWhite	#FFFFFAF0	Linen	#FFFAF0E6	Red	#FFFF0000
BlanchedAlmond	#FFFFEBCD	ForestGreen	#FF228B22	Magenta	#FFFF00FF	RosyBrown	#FFBC8F8F
Blue	#FF0000FF	Fuchsia	#FFFF00FF	Maroon	#FF800000	RoyalBlue	#FF4169E1
BlueViolet	#FF8A2BE2	Gainsboro	#FFDCDCDC	MediumAquamarine	#FF66CDAA	SaddleBrown	#FF8B4513
Brown	#FFA52A2A	GhostWhite	#FFF8F8FF	MediumBlue	#FF0000CD	Salmon	#FFFA8072
BurlyWood	#FFDEB887	Gold	#FFFFD700	MediumOrchid	#FFBA55D3	SandyBrown	#FFF4A460
CadetBlue	#FF5F9EA0	Goldenrod	#FFDAA520	MediumPurple	#FF9370DB	SeaGreen	#FF2E8B57
Chartreuse	#FF7FFF00	Gray	#FF808080	MediumSeaGreen	#FF3CB371	SeaShell	#FFFFF5EE
Chocolate	#FFD2691E	Green	#FF008000	MediumSlateBlue	#FF7B68EE	Sienna	#FFA0522D
Coral	#FFFF7F50	GreenYellow	#FFADFF2F	MediumSpringGreen	#FF00FA9A	Silver	#FFC0C0C0
CornflowerBlue	#FF6495ED	Honeydew	#FFF0FFF0	MediumTurquoise	#FF48D1CC	SkyBlue	#FF87CEEB
Cornsilk	#FFFFF8DC	HotPink	#FFFF69B4	MediumVioletRed	#FFC71585	SlateBlue	#FF6A5ACD
Crimson	#FFDC143C	IndianRed	#FFCD5C5C	MidnightBlue	#FF191970	SlateGray	#FF708090
Cyan	#FF00FFFF	Indigo	#FF4B0082	MintCream	#FFF5FFFA	Snow	#FFFFFAFA
DarkBlue	#FF00008B	Ivory	#FFFFFFF0	MistyRose	#FFFFE4E1	SpringGreen	#FF00FF7F
DarkCyan	#FF008B8B	Khaki	#FFF0E68C	Moccasin	#FFFFE4B5	SteelBlue	#FF4682B4
DarkGoldenrod	#FFB8860B	Lavender	#FFE6E6FA	NavajoWhite	#FFFFDEAD	Tan	#FFD2B48C
DarkGray	#FFA9A9A9	LavenderBlush	#FFFFF0F5	Navy	#FF000080	Teal	#FF008080
DarkGreen	#FF006400	LawnGreen	#FF7CFC00	OldLace	#FFFDF5E6	Thistle	#FFD8BFD8
DarkKhaki	#FFBDB76B	LemonChiffon	#FFFFFACD	Olive	#FF808000	Tomato	#FFFF6347
DarkMagenta	#FF8B008B	LightBlue	#FFADD8E6	OliveDrab	#FF6B8E23	Transparent	#00FFFFFF
DarkOliveGreen	#FF556B2F	LightCoral	#FFF08080	Orange	#FFFFA500	Turquoise	#FF40E0D0
DarkOrange	#FFFF8C00	LightCyan	#FFE0FFFF	OrangeRed	#FFFF4500	Violet	#FFEE82EE
DarkOrchid	#FF9932CC	LightGoldenrodYellow	#FFFAFAD2	Orchid	#FFDA70D6	Wheat	#FFF5DEB3
DarkRed	#FF8B0000	LightGray	#FFD3D3D3	PaleGoldenrod	#FFEEE8AA	White	#FFFFFFFF
DarkSalmon	#FFE9967A	LightGreen	#FF90EE90	PaleGreen	#FF98FB98	WhiteSmoke	#FFF5F5F5
DarkSeaGreen	#FF8FBC8F	LightPink	#FFFFB6C1	PaleTurquoise	#FFAFEEEE	Yellow	#FFFFFF00
DarkSlateBlue	#FF483D8B	LightSalmon	#FFFFA07A	PaleVioletRed	#FFDB7093	YellowGreen	#FF9ACD32
DarkSlateGray	#FF2F4F4F						

BLUE in table = #FF0000FF = Opacity+RGB

Image sources and more details: Thestarman.pcministry + Microsoft

216=6³ Web safe palette FF CC 99 66 33 00

Image sources and more details: Wordpress

Color #660000 or #600

*in some color systems named as **BloodRed***

Viewer of LCD Testbench V3.3 - C:\SPS\testbenchLCD.txt

File   Show   Zoom   Help
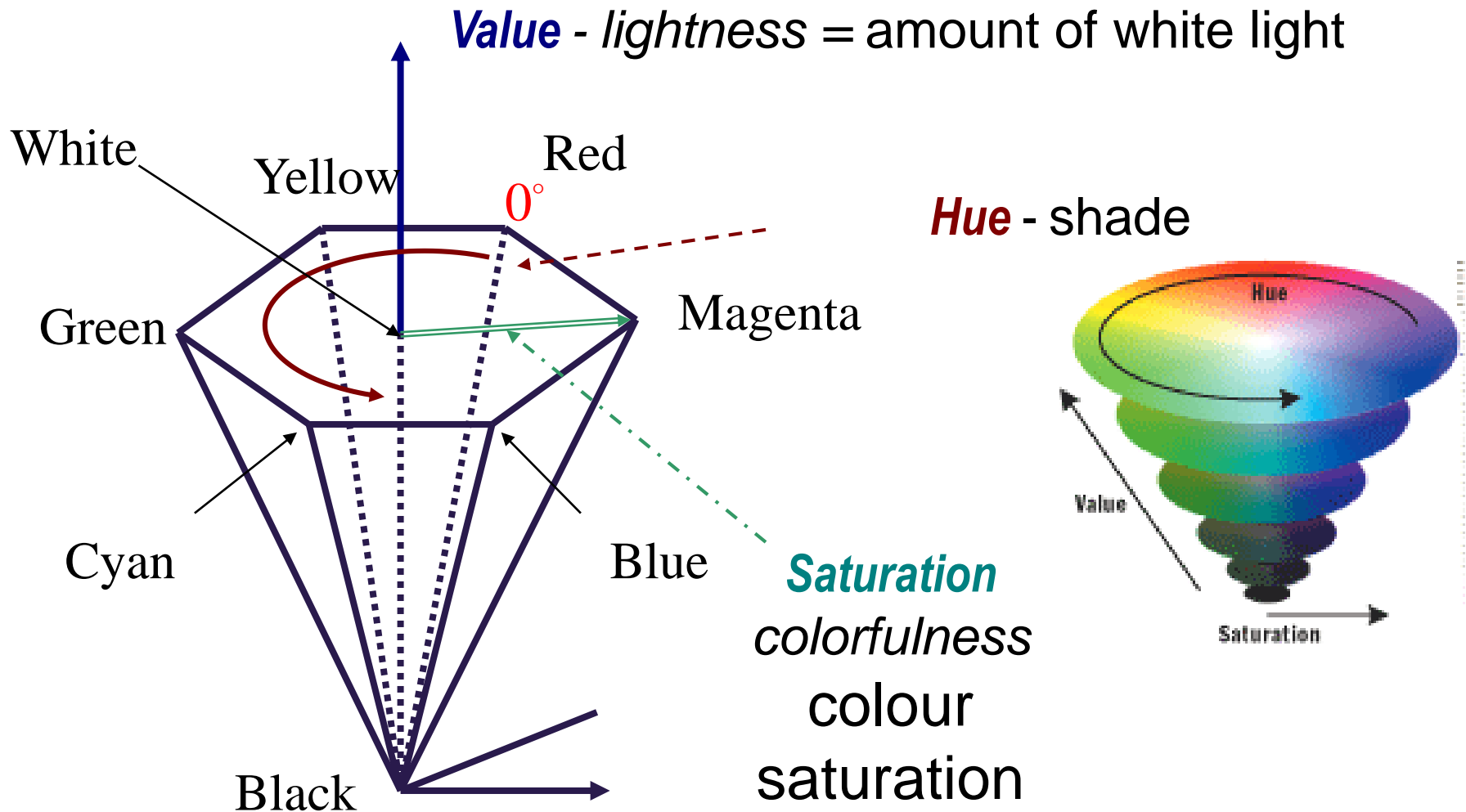
Auto ☑   **Reload**   **Zoom** 100% 100%   **X,Y** 338, 194   **RGB** 0x660000 (102,0,0: near Maroon) [DE='1']

RGB 0x660000 (102,0,0: near Maroon) [DE='1']

Maroon
somewhere
#550000
elsewhere
#800000
(Windows)
:-)

Value - lightness = amount of white light

White

Yellow

Red

0°

Hue - shade

Green

Magenta

Cyan

Blue

Saturation
colorfulness
colour
saturation

Black

LCDpackV2.vhd: function **HsvToRGB**(H,S,V:natural) return RGB_t

It's not too exact because it calculates conversion in integer arithmetic.