Hello You

The Middle Path

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Where innovation starts

Processing: After the course

- **Use the processing environment and:**
- **- create programs … that run**
- **- … that draw pictures**
- **- … that display animations**
- **- … that display interactive animations**
- **- … that animate interactive objects**

- **last but not least: make all of these work together as you like … great freedom to create**

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Assignors

After this 1st lesson: what can you do

- **Start processing.**
- **run your first program in processing**
- **write programs that create various static objects i.e. "pictures"**
- **change these programs to change the pictures.**
- **Understand how the pictures change when you change the program.**
- **Have a first idea about creating interactive objects.**

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After 1ˢᵗ lesson:
What should you understand ?

- **Why processing (and programming in general) is interesting and important for you as a designer**
- **What syntax is ?**
- **What expressions are?**
- **What (basic) types and variables are ?**
- **What semantics is ? How to look it up?**
- **How to think about programs.   (a little)**

Downloading processing…

Go to wiki created for the assignment:

- **http://wiki.id.tue.nl/creapro**

- **go there and click on:**
- **Prepare your computer for the assignment**
- **then click on the link:**
- **Download processing.   (a stable release)**
- **Create a directory "Programs" on the C: disk, in the root. If "C:\Programs" exists already, skip this step.**
- **Extract the entire directory to C:\Programs (note, not "C:\Program Files"). if you are reinstalling Processing, remove the entire processing directory first.**

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Before you start …
Experience some Examples

- **Open menu:**
- **File | Examples | 3D and OpenGL | Form |**

- **run: CubicGrid**

- **Open menu:**
- **File|Examples|Topics|Interaction|**
- **run: follow 1**
- **run: follow 2**
- **run: follow 3**

Design Process: integrate various skills
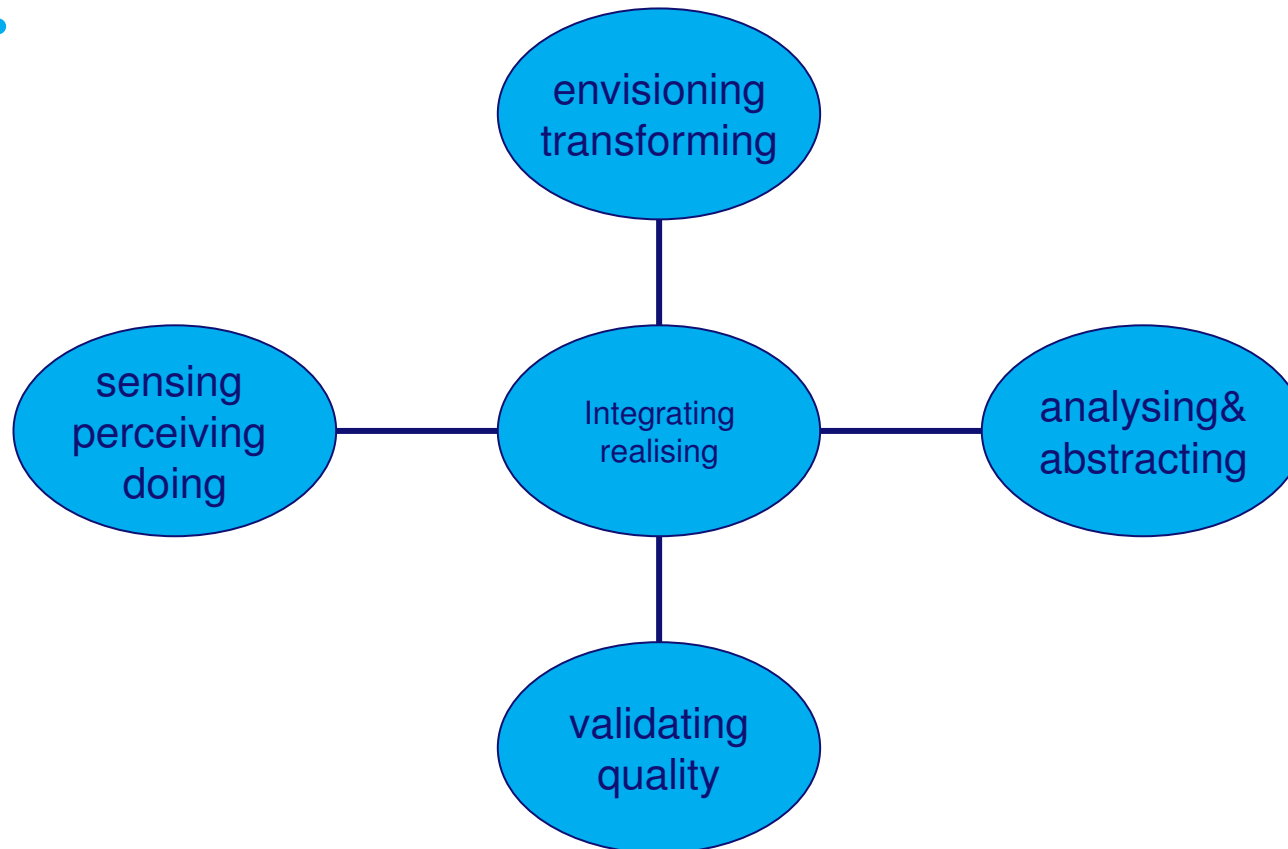
Look at the chart: say the
Color not the word

Black   Blue   Green
White   Green   Red
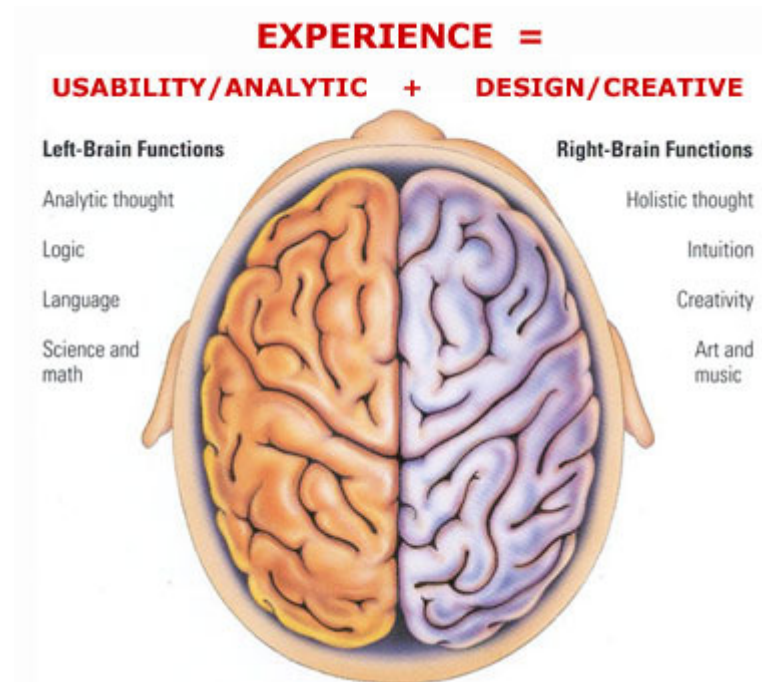Green   Aqua   Yellow
Yellow Pink   Tan
Red   Yellow White

Example produces a Left\Right brain conflict
The right brain tries to say the color
The left brain tries to read the color
http://OfficeSpam.ChattaBlogs.com

Need to integrate Left & Right brain

EXPERIENCE =
USABILITY/ANALYTIC   +   DESIGN/CREATIVE

Left-Brain Functions

Analytic thought

Logic

Language

Science and math

Right-Brain Functions

Holistic thought

Intuition

Creativity

Art and music

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Left versus Right

- **abstract objects that are represented in language are easy to change and to duplicate but are not immediately graspable or visible, and cannot be placed in the relevant context**

- **concrete objects that are created in matter can be inspected and manipulated easier, but are more difficult to change and to duplicate.**

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We want best of both worlds

- **define and create objects through language**

- **grasp and inspect objects through senses.**

- **Processing can execute abstract instructions in a computer language and translate these into something that you can experience through the senses.**

Programming languages : How does it work?

- **processing is an <u>imperative</u> language: that means you use the language to give <u>commands</u>**

- **The computer creates the application by executing the commands one after the other … it is a <u>sequential</u> language**

- **compare with written music : parallel (orchestra)**
- **can also be done in programs …very difficult.**

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Lets Start …

- **Click on the processing icon …**

- **Window opens with: run, stop   and new,open,save,export. export makes applets.**

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First program "Hello you"

- **print("hello you");**

- **print("hello ");**
- **print("you");**
- **println("commands are separated by semicolons");**
- **print(5*3);**

- **print("We count"+ 2+1+5+10 + "characters");**
- **print("We count"+ (2+1+5+10) + "characters");**

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Variable

- **A variable is a named location where a certain type of value can be stored**

- **String anExample;**

- **anExample = "fghjkl";**

- **int multiplier = 5;**

- **float pi = 3.1415926535897932;**

- **print(multiplier * pi) ;**

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Correctness : 3 Levels

- **Syntax (language form) : wellformed grammatical expressions: orders of brackets, semicolons, operators, letters and numbers.**

- **Types (kinds of things) : distinghuish apples from oranges**

- **Semantics (meaning) : does the program do what you want ?**

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Syntax : wellformed or not ?
Try some examples …

- **print("hhhh   ggg");**
- **print("a") ; print("b") ;**
- **print(8); {print(8) ; } ; {{{print(8); }}} ;**
- **print("hello you)" ;**

- **// this is just a comment …..**

- **print(" jjjhhh) "))**   ➔ **syntax error: semi expected found)**
-
- **print("a") print("b")**   ➔ **syntax error: semicolon missing …**

- **commands can contain expressions ….**

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Expressions can be nested …

- **3*4**

- **sin(3*4)**

- **sin(3* tan(5) / exp(sin(cos(0.45454))))**

- **"abcd"+"efgh"**
- **"abcd" + ("ef" + "gh")**

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Types

- **String "hhhheeeee" "aaa"+ "nnbn99 bnb"**

- **int   8   9* 97978787   1-9988989**

- **float   2333.5555**
- **   sin(-3 * 5677.455)**
- **   3.4e+38**

- **basic types are: String, float,int, boolean, char, byte,**

- **(to be continued … can do)**

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SEMANTICS

- **The meaning of the command; this may depend on type.**

- **int myAge;**
- **myAge = 8;**
- **print(myAge * 8);**
- **print(" 8 + 8 ");**
- **print(" Hello");**

- **print("I count"+ 1+1+5+10 + "characters");**
- **print(myAge+ (1+1+5+10));**

- **(to be continued)**

How to think about commands:

- **setting up a picture, or later a stage, using predefined primitives**

- **first start with a static picture:**
- **create empty picture with command "size":**

- **size(200,200);**
- **Next: specify what you put where:**
- **you can use various standard primitives with parameters:**

- **point(20,45)**
- **line(0,0,100,150)**

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Example ...

- **go to menu:**

- **Example|Basics|Form|**
- **run: <u>PointsLines</u>**

- **what is semantics (meaning)**
- **of : stroke(153)   ?**
- **:   background(0) ?**

Semantics

- **To find the meaning look for the (informal) specifications ..**

- **doubleclick on "stroke" to find out …**
- **choose : find in reference**

- **doubleclick on "background" to find out …**

- **these commands <u>specify drawing parameters</u>**

Specify drawing parameters …

- **stroke(255)   255 = white 0 = black in between are shade of gray ..**

- **background(200,23,130) ;   (e.g. you can also use color)**

- **nostroke() …etc various primitives**

- **C:\Programs\processing-0135\reference\index.html**

Also two dimensional shapes are possible ...

- **rect(20,20,60,120);**
- **ellipse(50,50,30,99);**

- **Example|Basics|Form|**
- **run: ShapePrimitives**

Interactive drawings …

- **create a <u>stage</u> with :**
- **void setup() {**
- ** size(200, 200);**
- **}**

- **the you can draw … continuously …with the draw command ..**
- ** For example …**

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Interactive drawings ...

- **void setup() {**
- **size(200, 200);**
- **smooth();** // **makes forms smoother**
- **strokeWeight(2);** //**how thick lines are**
- **stroke(255);** //**color of lines (white)**
- **}**
- **void draw() {**
- **background(mouseX,mouseY, 80);** // **background color**
- **line(200, 0, mouseX, mouseY);**
- **line(mouseX,mouseY, 0, 200);**
- **}**

Final remark : Style …

-
  - **proper indentation**
  - **comprehensible comments**
  - **(using autoformat in Tools menu?)**

  - **balanced pictures …**
  - **beautiful movements …**