

Interactive Painting with Processing

Debugging, Active Mode,
Functions, Switch Statement,
Mouse and Keyboard Interaction

What is a bug?

Error
Flaw
Mistake
Failure
Fault

Debugging in Processing

- Add detailed comments
- Explain what code does to someone else, step by step
 - Print out values to the console using `println()`
 - Fiddle with values
- Temporarily change shapes to an obvious color, add thick outlines, etc
 - Walk away for a bit!

Demo: Paint!

Start with a plan!

We need variables to do the following:

1. Store the default color of our canvas
2. Store the possible paint colors (red, green, blue)
3. Store how big each paint dab should be
4. Keep track of what color we are currently painting with

Start with a plan!

Steps we should take to build the program bit by bit:

1. Draw a paint dab in the middle of the screen using the color stored in our variable
2. Change the color of the paint when the r, g, or b key is pressed
3. Draw paint dabs wherever the mouse has been clicked and dragged
4. Clear the screen when the space key is pressed

Why use variables?

To avoid repetition.

To make code easier to read.

To store values that change when the program runs.

morningRoutine



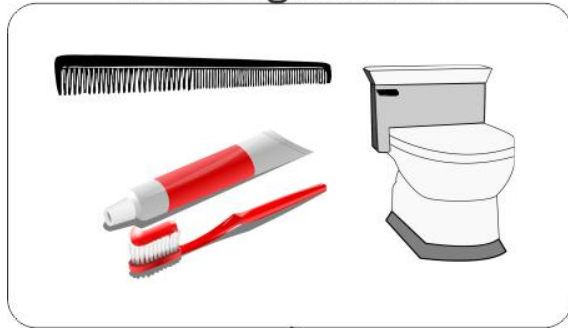
morningRoutine



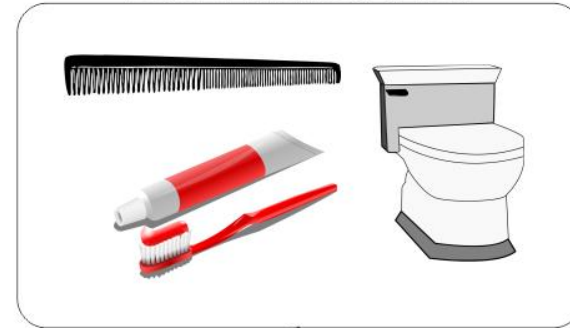
bedtimeRoutine



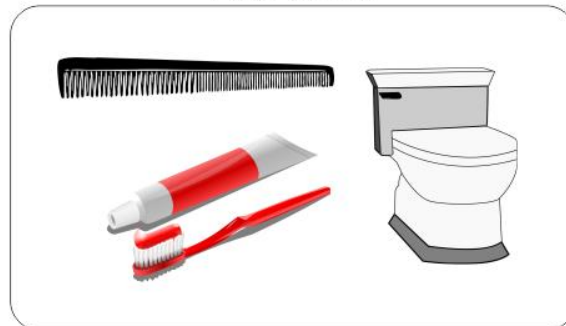
morningRoutine



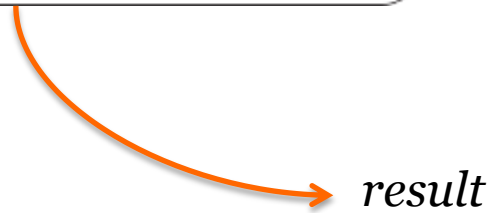
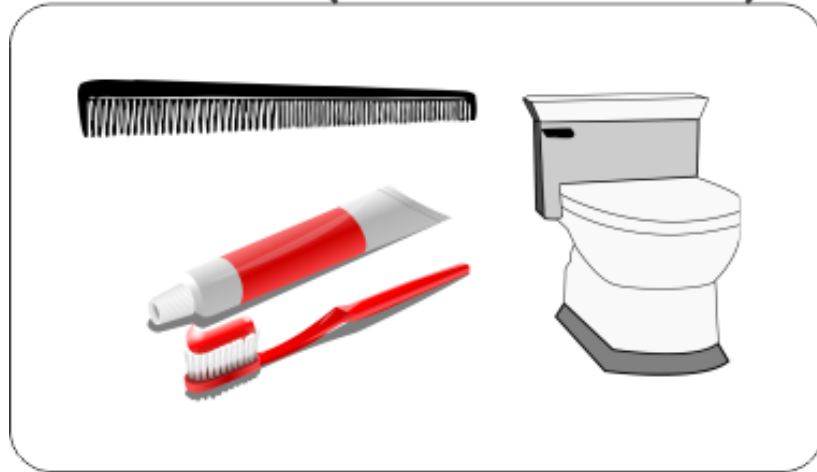
bedtimeRoutine



routine



`routine(doThisFirst)`



result

Functions

```
ellipse (...)  
  line (...)  
background (...)  
  color (...)  
  noFill ()  
println (...)
```



<http://wakpaper.com/id144625/download-ship-wallpapers-nice-white-big-sailboat-sailing-wallpaper-1600x1200-pixel.html>

<http://computationaltales.blogspot.ca/2011/04/functions-and-sailing.html>

	<p><i>How to tie the boat to the dock</i></p>	<p>step 1 step 2 step 3 tie knot step 1 tie knot step 2 tie knot step 3 tie knot step 4 tie knot step 5 tie knot step 6 step 4 step 5 step 6 step 7</p>	
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*How to tie
the boat to
the dock*

step 1

step 2

step 3

tie knot step 1

tie knot step 2

tie knot step 3

tie knot step 4

tie knot step 5

tie knot step 6

step 4

step 5

step 6

step 7

*How to tie
the boat to
the dock*

step 1
step 2
step 3

tie knot (pg 2)

step 4
step 5
step 6
step 7

Functions

```
void ellipse(float x, float y, float width, float height)
{
    // code in here that does something
    // (in this case, no result is returned)
}
```

Functions

function name

```
void ellipse(float x, float y, float width, float height)
{
    // code in here that does something
    // (in this case, nothing returned)
}
```

Functions

parameter list

```
void ellipse(float x, float y, float width, float height)
{
    // code in here that does something
    // (in this case, nothing returned)
}
```

Functions

parameter type

```
void ellipse(float x, float y, float width, float height)
{
    // code in here that does something
    // (in this case, nothing returned)
}
```

Functions

parameter name

```
void ellipse(float x, float y, float width, float height)
{
    // code in here that does something
    // (in this case, nothing returned)
}
```

Functions

```
void ellipse(float x, float y, float width, float height)
{
    // code in here that does something
    // (in this case, nothing returned)
}
```

function body

Functions

return type

```
void ellipse(float x, float y, float width, float height)
{
    // code in here that does something
    // (in this case, nothing returned)
}
```

Functions

return type

```
color color(int red, int green, int blue)
{
    // creates and returns color data type
}
```

Functions

empty parameter list

```
void noFill()  
{  
    // does some stuff to turn off fill  
}
```

Active Mode in Processing

```
void setup()  
{  
    // Runs once at the beginning of  
program  
}
```

```
void draw()  
{  
    // Runs once every frame  
}
```

Poll Everywhere Question:

```
color myColor = color(255,0,0);
```

```
void setup()
{
  color myColor = color(0,0,255);
  fill(myColor);
}
```

```
void draw()
{
  ellipse(50,50,100,100);
}
```

```
void mouseClicked()
{
  fill(myColor);
}
```

What color will the circle be when the program starts? When the mouse is clicked?

Text 37607

183377: Red, Blue

183378: Blue, Red

183380: Red, Red

183389: Blue, Blue

183580: Error

Switch Statement

```
switch (key)
{
    case 'r':
        // do stuff
        break;
    case 'g':
        // do stuff
        break;
    default:
        break;
}
```

Switch Statement

starts the
switch
statement

```
switch(key)
{
    case 'r':
        // do stuff
        break;
    case 'g':
        // do stuff
        break;
    default:
        break;
}
```

Switch Statement

value to match
(usually a
variable)

```
switch (key)
{
    case 'r':
        // do stuff
        break;
    case 'g':
        // do stuff
        break;
    default:
        break;
}
```


Switch Statement

body of the
switch
statement

```
switch (key)
{
    case 'r':
        // do stuff
        break;
    case 'g':
        // do stuff
        break;
    default:
        break;
}
```

Switch Statement

```
switch (key)
{
    case 'r':
        // do stuff
        break;
    case 'g':
        // do stuff
        break;
    default:
        break;
}
```

a possible
matching value

Switch Statement

code to run if
it's a match

```
switch (key)
{
    case 'r':
        // do stuff
        break;
    case 'g':
        // do stuff
        break;
    default:
        break;
}
```

Switch Statement

run code until
first break after
matching value

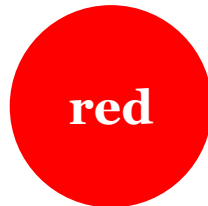
```
switch (key)
{
    case 'r':
        // do stuff
        break;
    case 'g':
        // do stuff
        break;
    default:
        break;
}
```

Poll Everywhere Question:

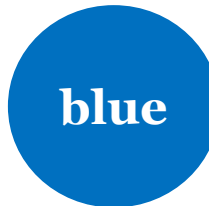
What colour will the circle be if we use myColor to fill it?

```
color myColor = color(255,0,0);
int number = 2;
switch(number)
{
  case 1:
    myColor = color(255,0,0);
    break;
  case 2:
    myColor = color(0,0,255);
  case 3:
    myColor = color(255,0,0);
}
```

Text: 37607



183942



183946

*Neither
(syntax error)*

183947