



# Applied Programming in Python 101

by Fritz Francisco

 @fritzafrancisco

# Logistics

**Who?:** Whoever wants to learn a about programming

**When?:** 15:00, Wednesday, Every other week

Where?: Haus 16 (or ZOOM)

**What?:**

Slides will be provided @

<https://amor.cms.hu-berlin.de/~francisf/material.html>

Material will be provided @

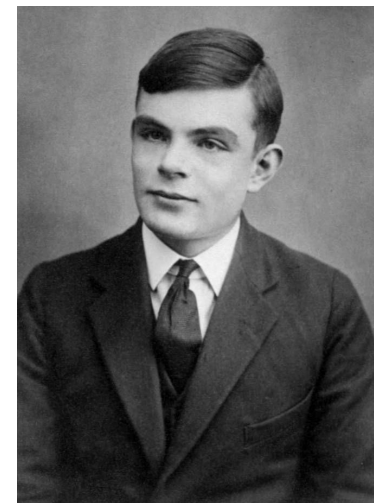
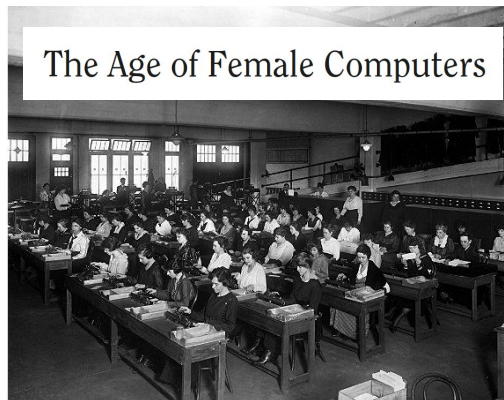
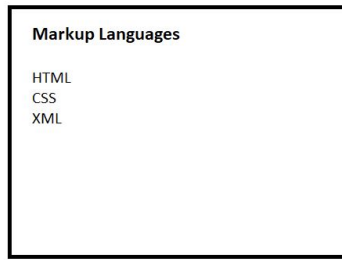
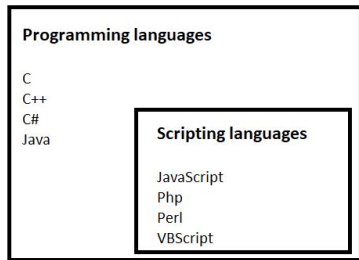
<https://github.com/fritzfrancisco>

# Chapter 1

What is programming?

# Chapter 1

## 1. Machine readable language



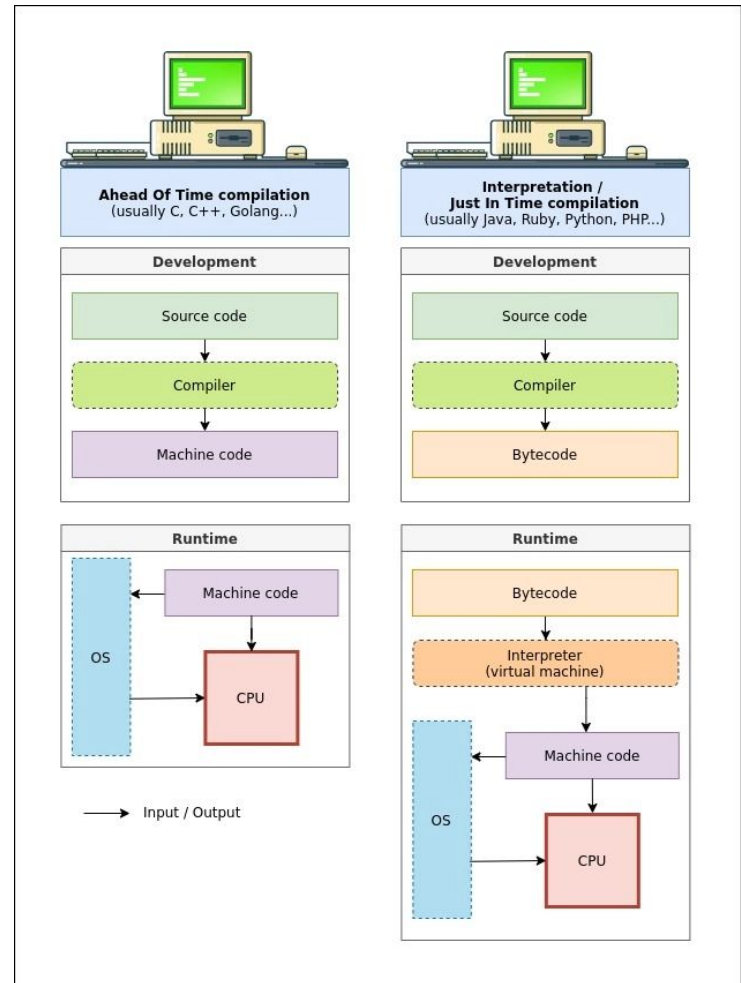
Further read:

<https://www.thenewatlantis.com/publications/the-age-of-female-computers>

Alan Turing (1912 – 1954)

# Chapter 1

1. Machine readable language
2. Interpretation vs. Compilation



## Chapter 1

Why do we use programming?

# Chapter 1

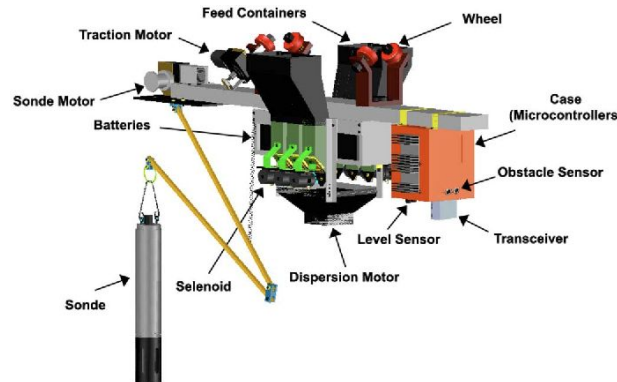
1. Script based approach:
  - a. Machine Code / Readable code
  - b. Abstract (0/1) / Human Readable

```
70 //fires the appear event when appropriate
71 var check = function() {
72
73     //is the element hidden?
74     if (!t.is(':visible')) {
75
76         //it became hidden
77         t.appeared = false;
78         return;
79     }
80
81     //is the element inside the visible window?
82     var a = w.scrollLeft();
83     var b = w.scrollTop();
84     var o = t.offset();
85     var x = o.left;
86     var y = o.top;
87
88     var ax = settings.accX;
89     var ay = settings.accY;
90     var th = t.height();
91     var wh = w.height();
92     var tw = t.width();
93     var ww = w.width();
94
95     if (y + th + ay >= b &&
96         y <= b + wh + ay &&
97         x + tw + ax >= a &&
98         x <= a + ww + ax) {
99
100         //trigger the custom event
101         if (!t.appeared) t.trigger('appear', settings.data);
102     } else {
103
104         //it scrolled out of view
105         t.appeared = false;
106     }
107 };
108
109 //create a modified fn with some additional logic
110 var modifiedFn = function() {
111
112     //mark the element as visible
113     t.appeared = true;
114
115     //is this supposed to happen only once?
116     if (settings.one) {
117
118         //remove the check
119         w.unbind('scroll', check);
120         var i = $.inArray(check, $.fn.appear.checks);
121         if (i >= 0) $.fn.appear.checks.splice(i, 1);
122     }
123
124     //trigger the original fn
125     fn.apply(this, arguments);
126
127 };
128
129 //bind the modified fn to the element
130 t.one('appear', settings.data, modifiedFn);
131 t.one('appear', settings.data, modifiedFn);
```

# Chapter 1

1. Script based approach:
  - a. Machine Code / Readable code
  - b. Abstract (0/1) / Human Readable

## 2. Automation



```
//fires the appear event when appropriate
var check = function() {
  //is the element hidden?
  if (!t.is(':visible')) {
    //it became hidden
    t.appeared = false;
    return;
  }

  //is the element inside the visible window?
  var a = w.scrollLeft();
  var b = w.scrollTop();
  var o = t.offset();
  var x = o.left;
  var y = o.top;

  var ax = settings.accX;
  var ay = settings.accY;
  var th = t.height();
  var wh = w.height();
  var tw = t.width();
  var ww = w.width();

  if (y + th + ay >= b &&
      y <= b + wh + ay &&
      x + tw + ax >= a &&
      x <= a + ww + ax) {
    //trigger the custom event
    if (!t.appeared) t.trigger('appear', settings.data);
  } else {
    //it scrolled out of view
    t.appeared = false;
  }
};

//create a modified fn with some additional logic
var modifiedFn = function() {
  //mark the element as visible
  t.appeared = true;
  //is this supposed to happen only once?
  if (settings.one) {
    //remove the check
    w.unbind('scroll', check);
    var i = $.inArray(check, $.fn.appear.checks);
    if (i >= 0) $.fn.appear.checks.splice(i, 1);
  }
  //trigger the original fn
  fn.apply(this, arguments);
};

//bind the modified fn to the element
$.fn.appear.one(settings.data, modifiedFn);
$.fn.appear.one(settings.data, modifiedFn);
```

# Chapter 1

1. Script based approach:
  - a. Machine Code / Readable code
  - b. Abstract (0/1) / Human Readable

## 2. Automation

## 3. Reproducibility/Sharing



```
//fires the appear event when appropriate
var check = function() {
  //is the element hidden?
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    //it became hidden
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    return;
  }

  //is the element inside the visible window?
  var a = w.scrollLeft();
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  var y = o.top;

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  var th = t.height();
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  var tw = t.width();
  var ww = w.width();

  if (y + th + ay >= b &&
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      x + tw + ax >= a &&
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    if (!t.appeared) t.trigger('appear', settings.data);
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    //it scrolled out of view
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  }
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//create a modified fn with some additional logic
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  if (settings.one) {
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    if (i >= 0) $.fn.appear.checks.splice(i, 1);
  }

  //trigger the original fn
  fn.apply(this, arguments);
};

//bind the modified fn to the element
$.fn.one('appear', settings.data, modifiedFn);
$.fn.appear(settings.data, modifiedFn);
```

# Chapter 1

1. Script based approach:
  - a. Machine Code / Readable code
  - b. Abstract (0/1) / Human Readable
2. Automation
3. Reproducibility
4. Creative and solution focused thinking



```
fires the appear event when appropriate
var check = function() {
  //is the element hidden?
  if (!t.is(':visible')) {
    //it became hidden
    t.appeared = false;
    return;
  }

  //is the element inside the visible window?
  var a = w.scrollLeft();
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  var o = t.offset();
  var x = o.left;
  var y = o.top;

  var ax = settings.accX;
  var ay = settings.accY;
  var th = t.height();
  var wh = w.height();
  var tw = t.width();
  var ww = w.width();

  if (y + th + ay >= b &&
      y <= b + wh + ay &&
      x + tw + ax >= a &&
      x <= a + ww + ax) {
    //trigger the custom event
    if (!t.appeared) t.trigger('appear', settings.data);
  } else {
    //it scrolled out of view
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  }
};

//create a modified fn with some additional logic
var modifiedFn = function() {
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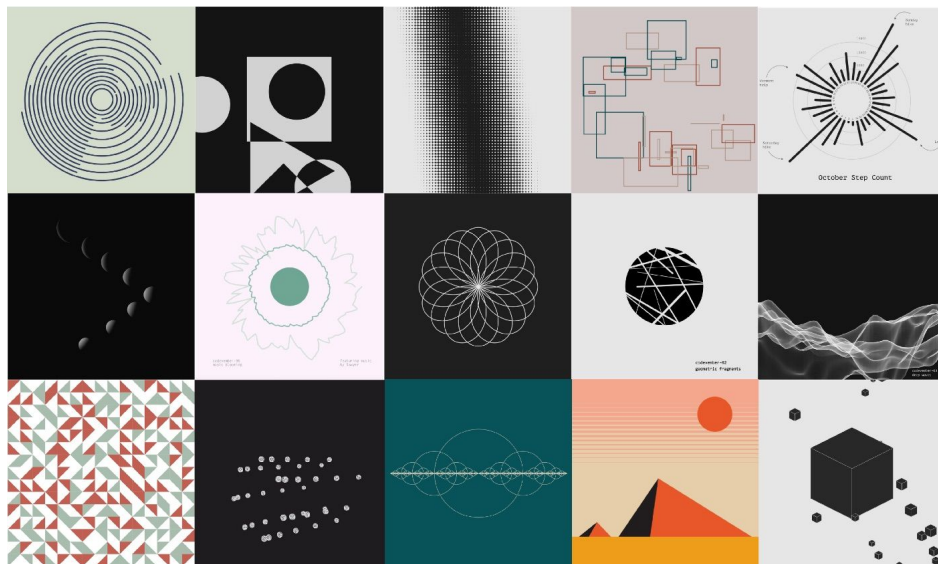
  //is this supposed to happen only once?
  if (settings.one) {
    //remove the check
    w.unbind('scroll', check);
    var i = $.inArray(check, $.fn.appear.checks);
    if (i >= 0) $.fn.appear.checks.splice(i, 1);
  }

  //trigger the original fn
  fn.apply(this, arguments);
};

//bind the modified fn to the element
$.fn.appear.one('appear', settings.data, modifiedFn);
$.fn.appear.settings.data, modifiedFn);
```

# Chapter 1

## 5. Creative Design

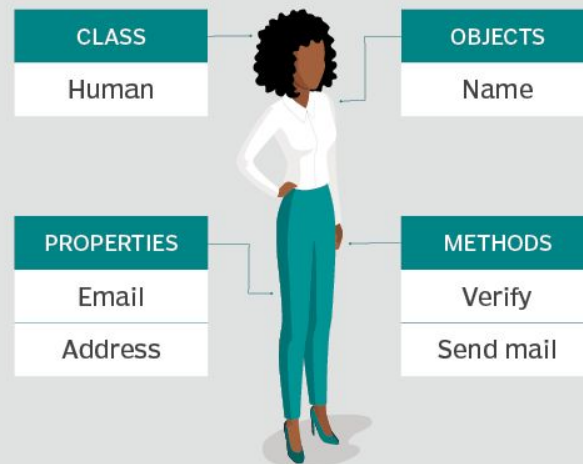


Further read:

<https://processing.org/>

<https://openprocessing.org/browse/>

## Object-oriented programming



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# Resources

1. [How to think like a computer scientist](#)
2. [Python Data Science Handbook](#)
3. [R for Data Science](#)