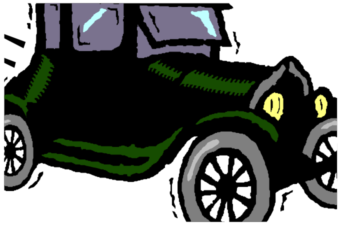


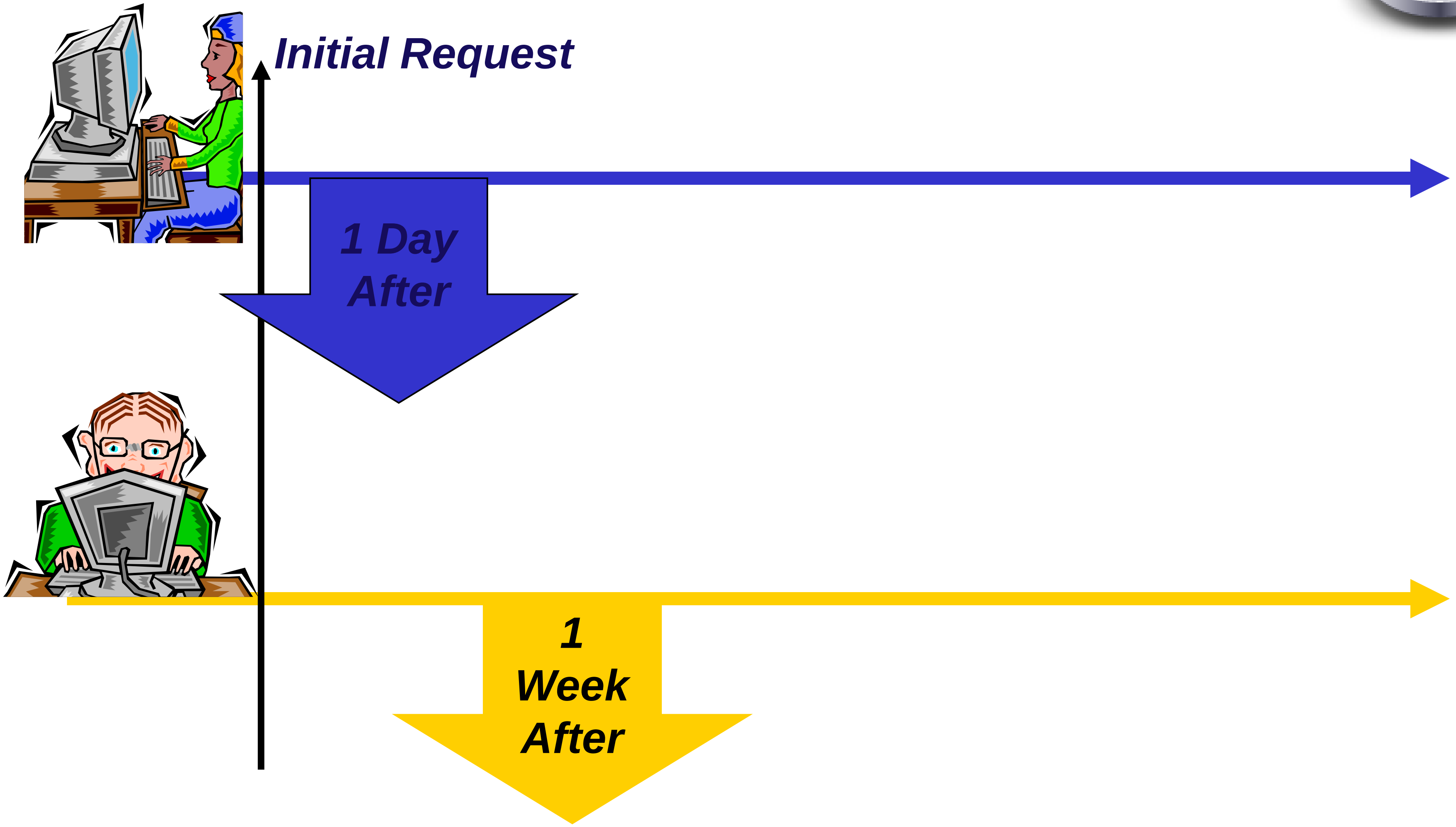
Conception Avancée de Base de Données

Design For Changes

Traduction en cours

Why we want It !!

Changes Request : flexible solution

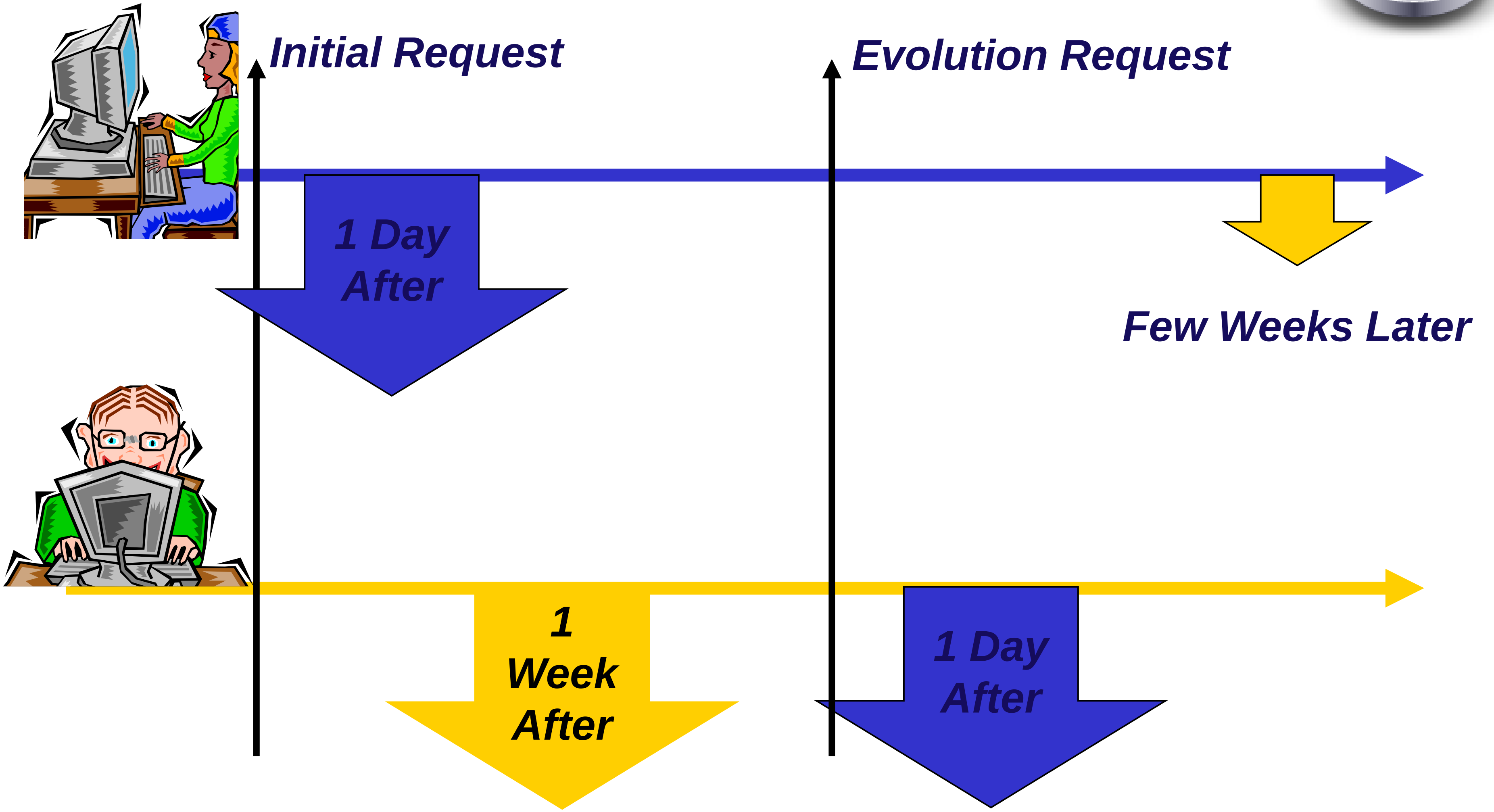


Initial Request

1 Day After

1 Week After

Changes Request : flexible solution



Initial Request

Evolution Request

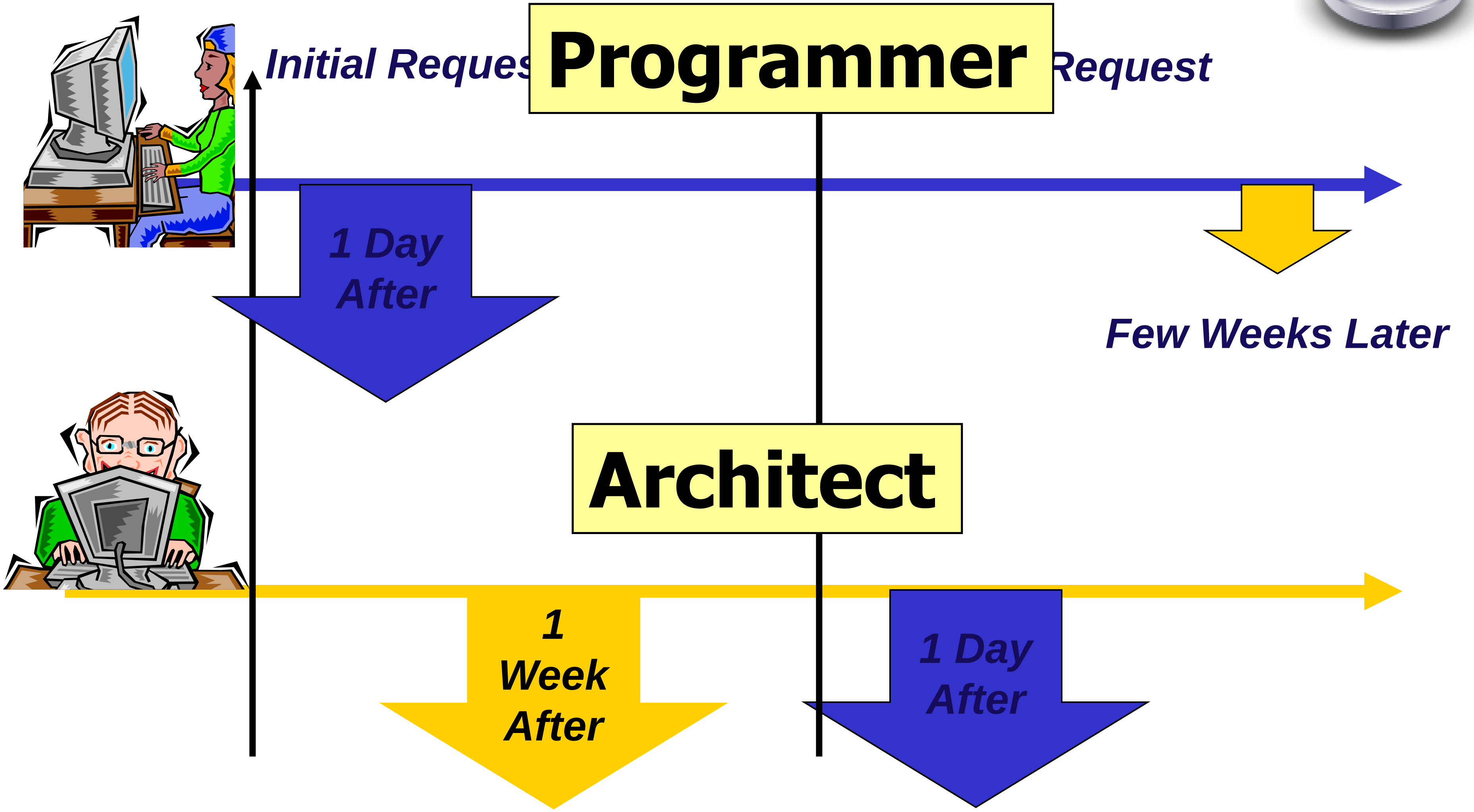
1 Day After

Few Weeks Later

1 Week After

1 Day After

Changes Request : flexible solution



Initial Reques

Programmer

Request

1 Day After

Few Weeks Later

Architect

1 Week After

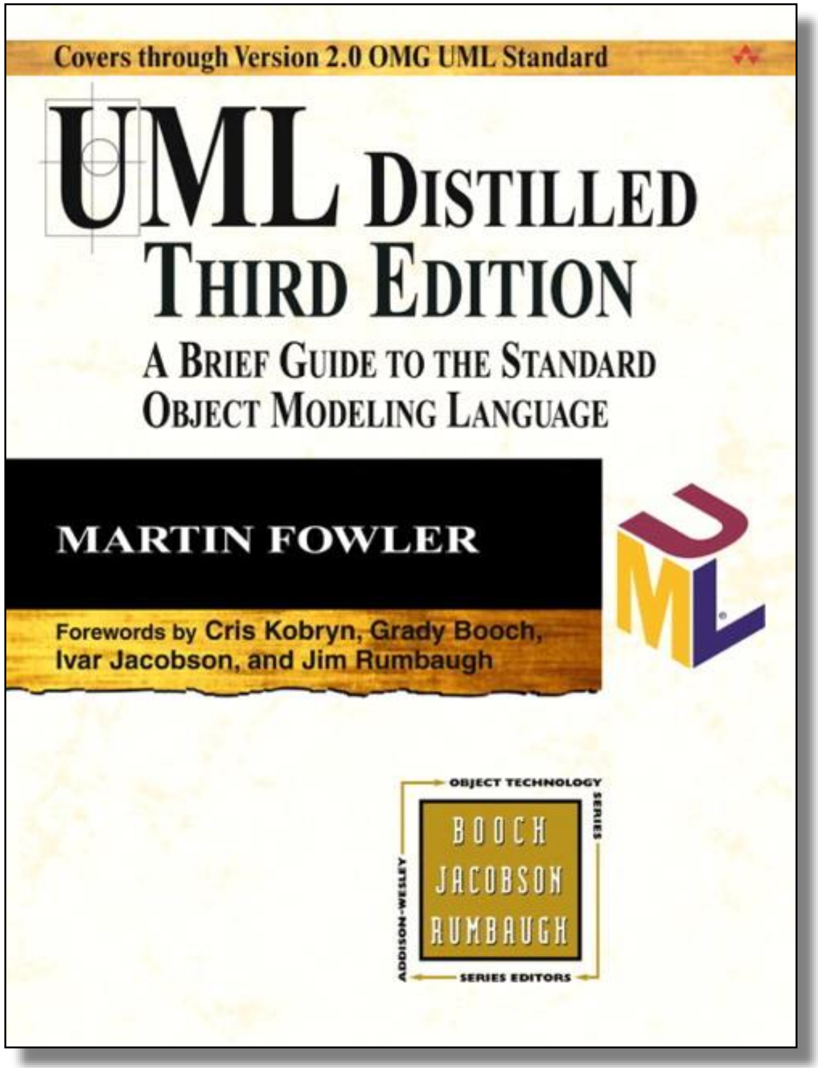
1 Day After

Changes Sources During Development

- Requirements :
  - Customers Discover What they Really Want During or at the End of Developments
- Technology
  - Performances Are Increasing With Time
- Skill
  - We Learn and Understand the Problem and We Discover the Right Solution on the Job
- Short Term Politic
  - No Comments

Martin FOWLER

Martin Fowler



Covers through Version 2.0 OMG UML Standard

UML DISTILLED THIRD EDITION

A BRIEF GUIDE TO THE STANDARD OBJECT MODELING LANGUAGE

MARTIN FOWLER

Forewords by Cris Kobryn, Grady Booch, Ivar Jacobson, and Jim Rumbaugh

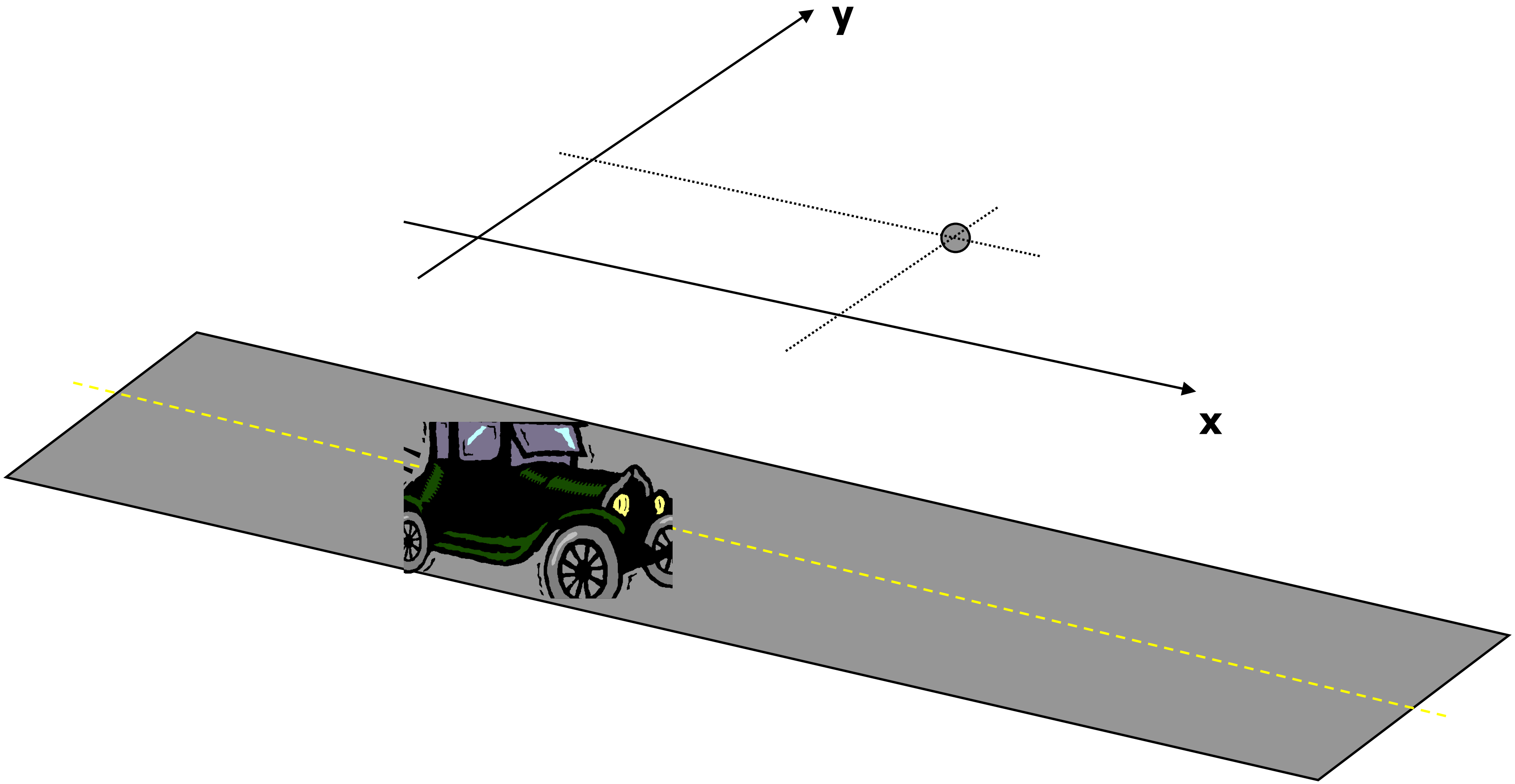
OBJECT TECHNOLOGY SERIES

BOOCH JACOBSON RUMBAUGH

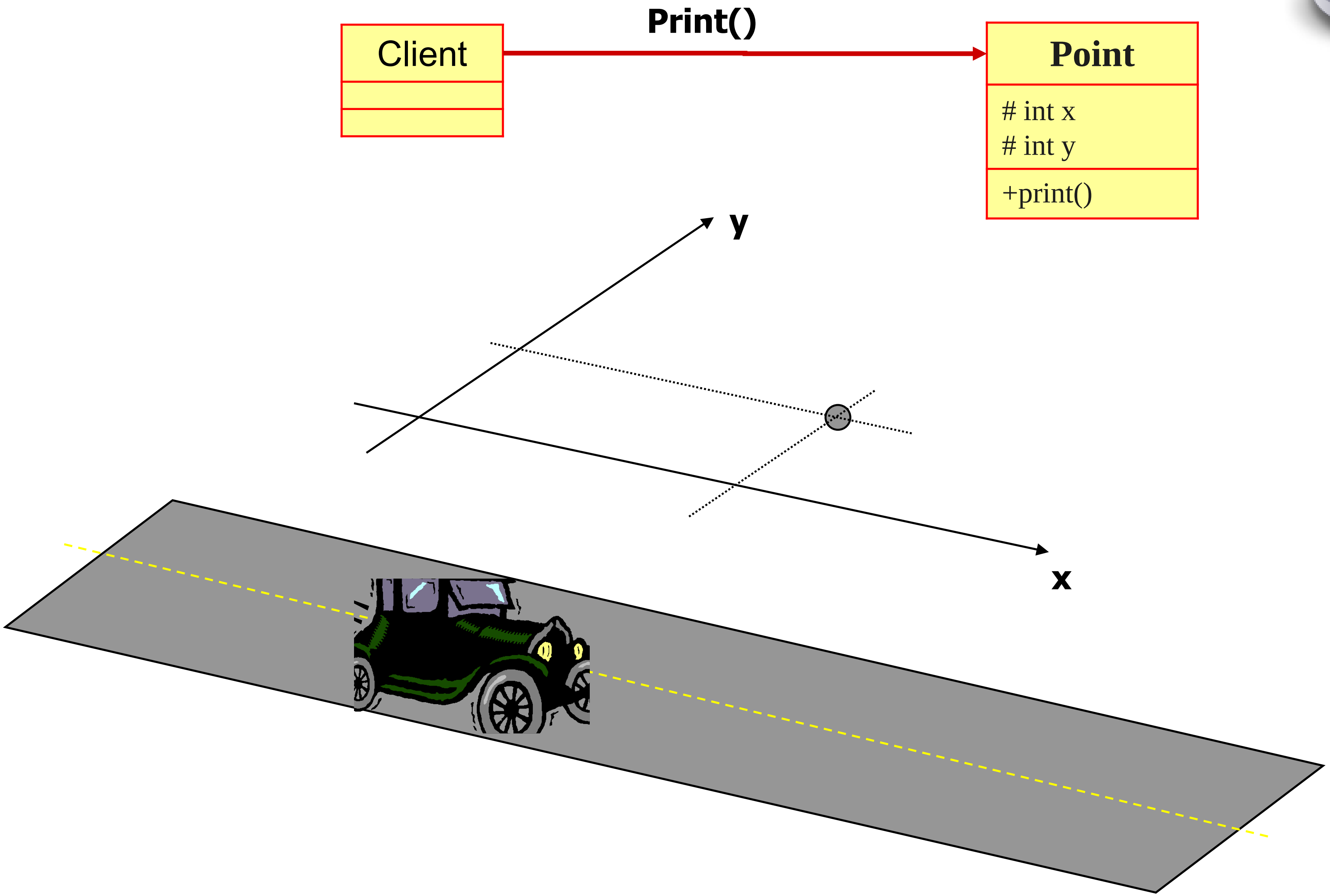
SERIES EDITORS

ADDISON-WESLEY

Programming in “present” tense



Programming in “present” tense



Client

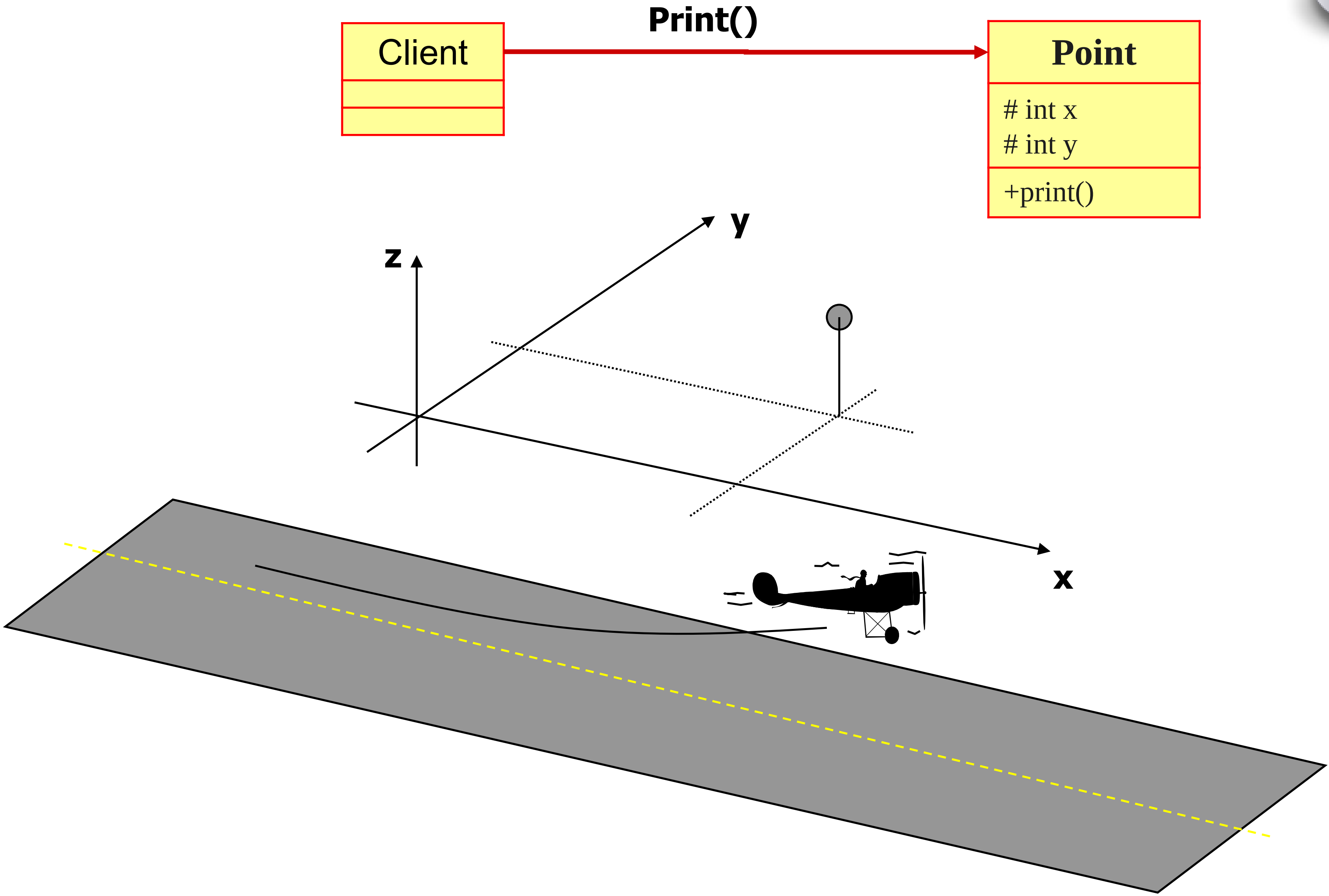
Print()

Point

# int x
# int y

+print()

Future



Client

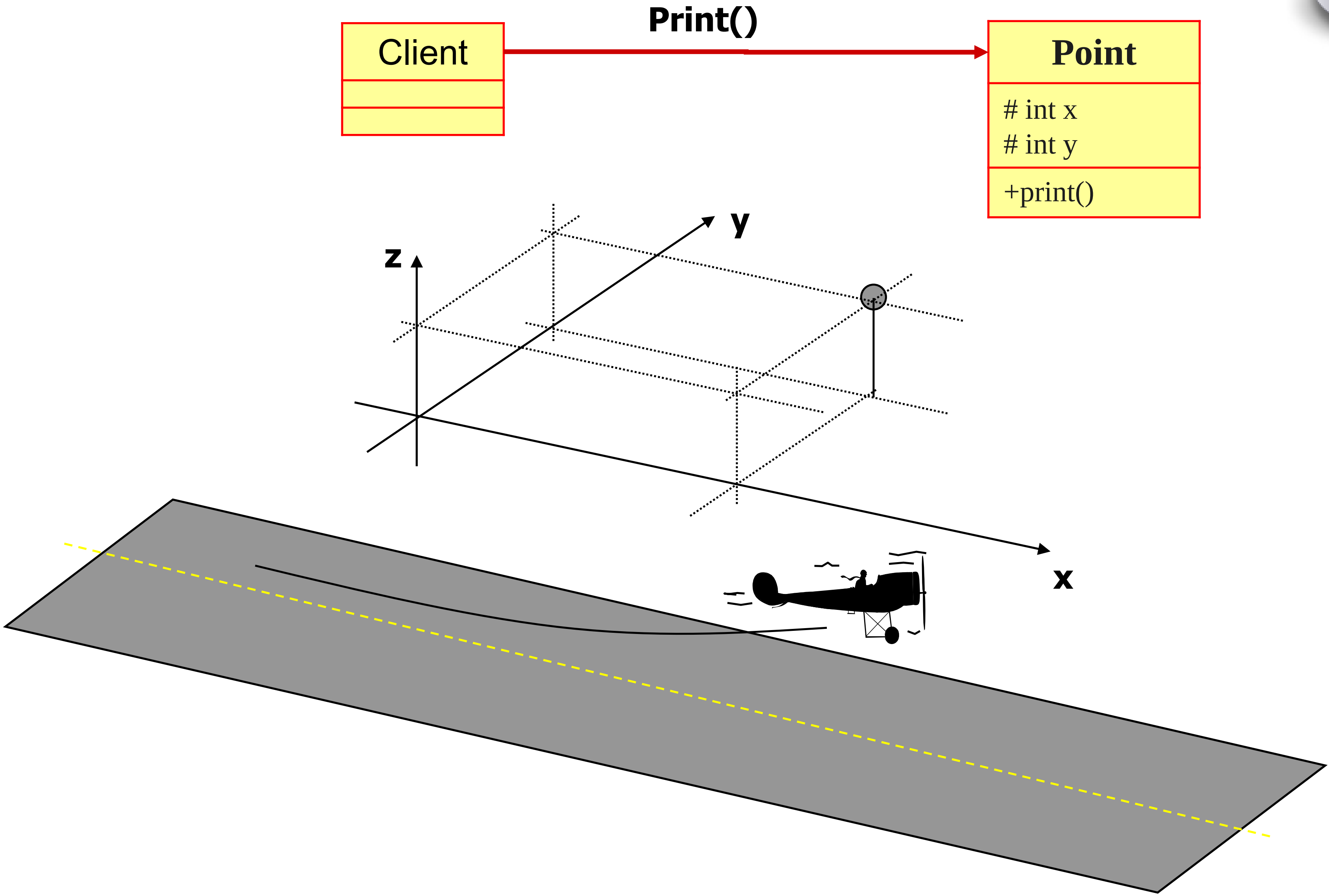
Print()

Point

# int x
# int y

+print()

Future



Print()

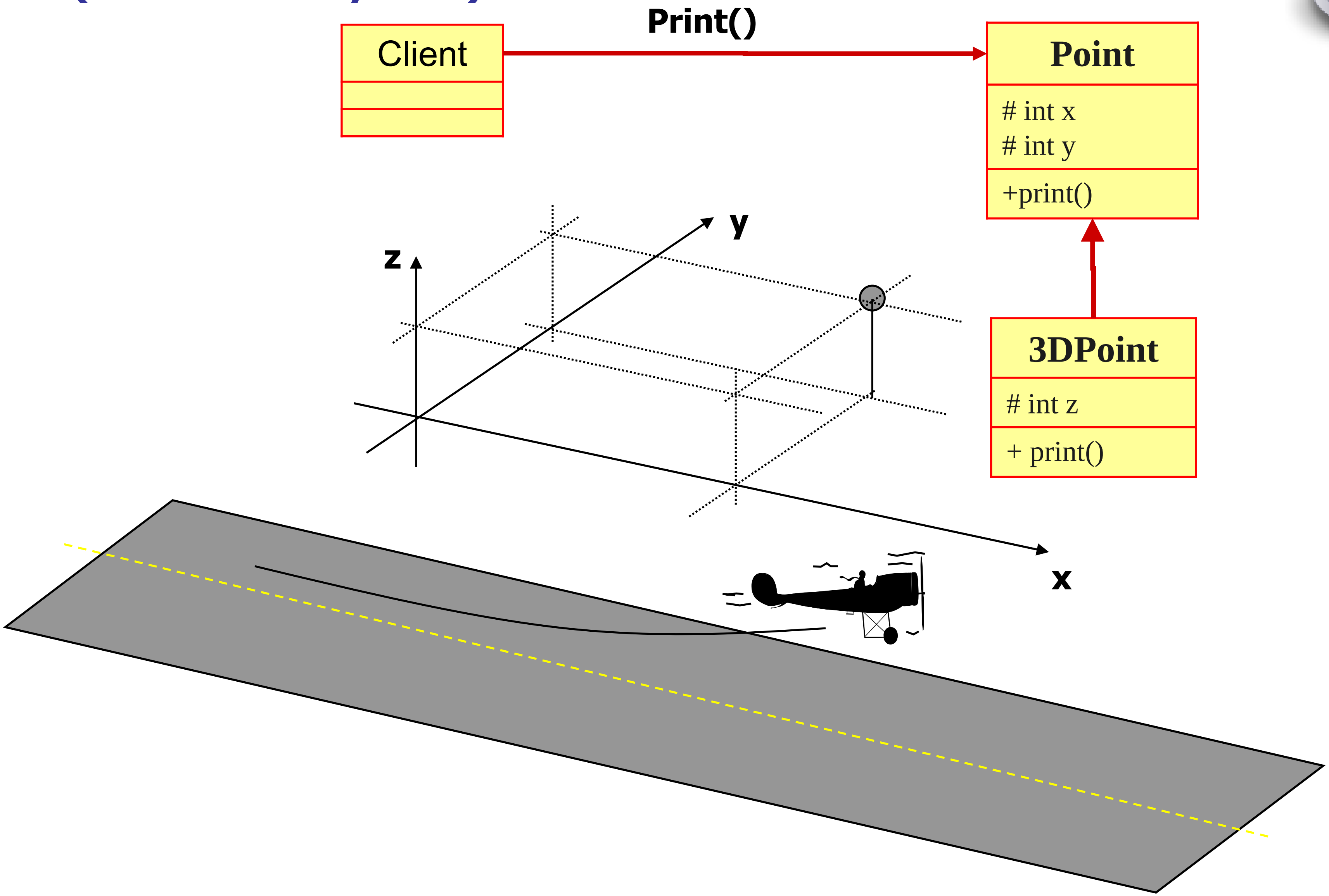
Client

Point

# int x
# int y

+print()

Programming in “Future” tense (Scott Meyers)



Client

Print()

Point

# int x
# int y

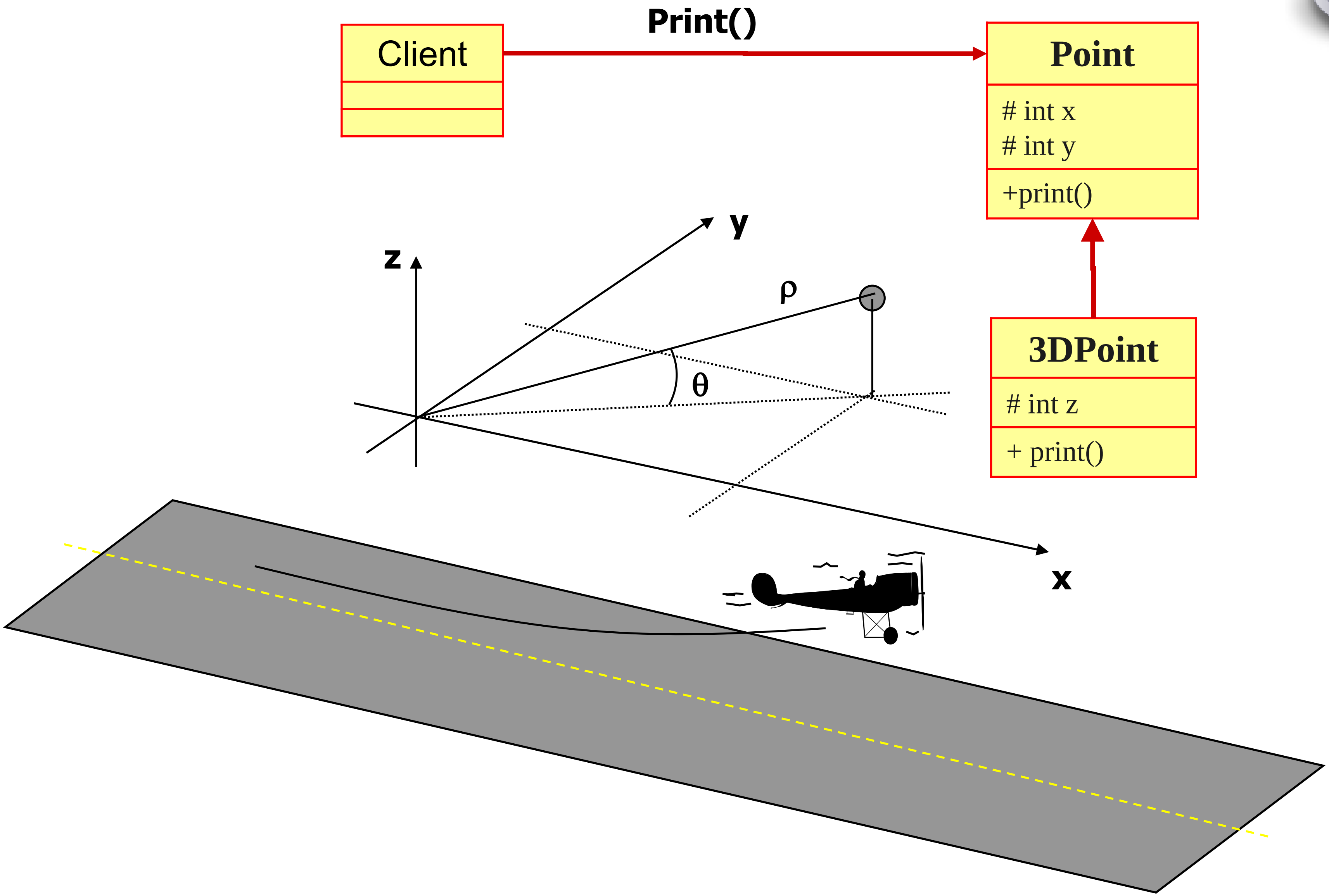
+print()

3DPoint

# int z

+ print()

Programming in “Future” tense



Client

Print()

Point

# int x
# int y

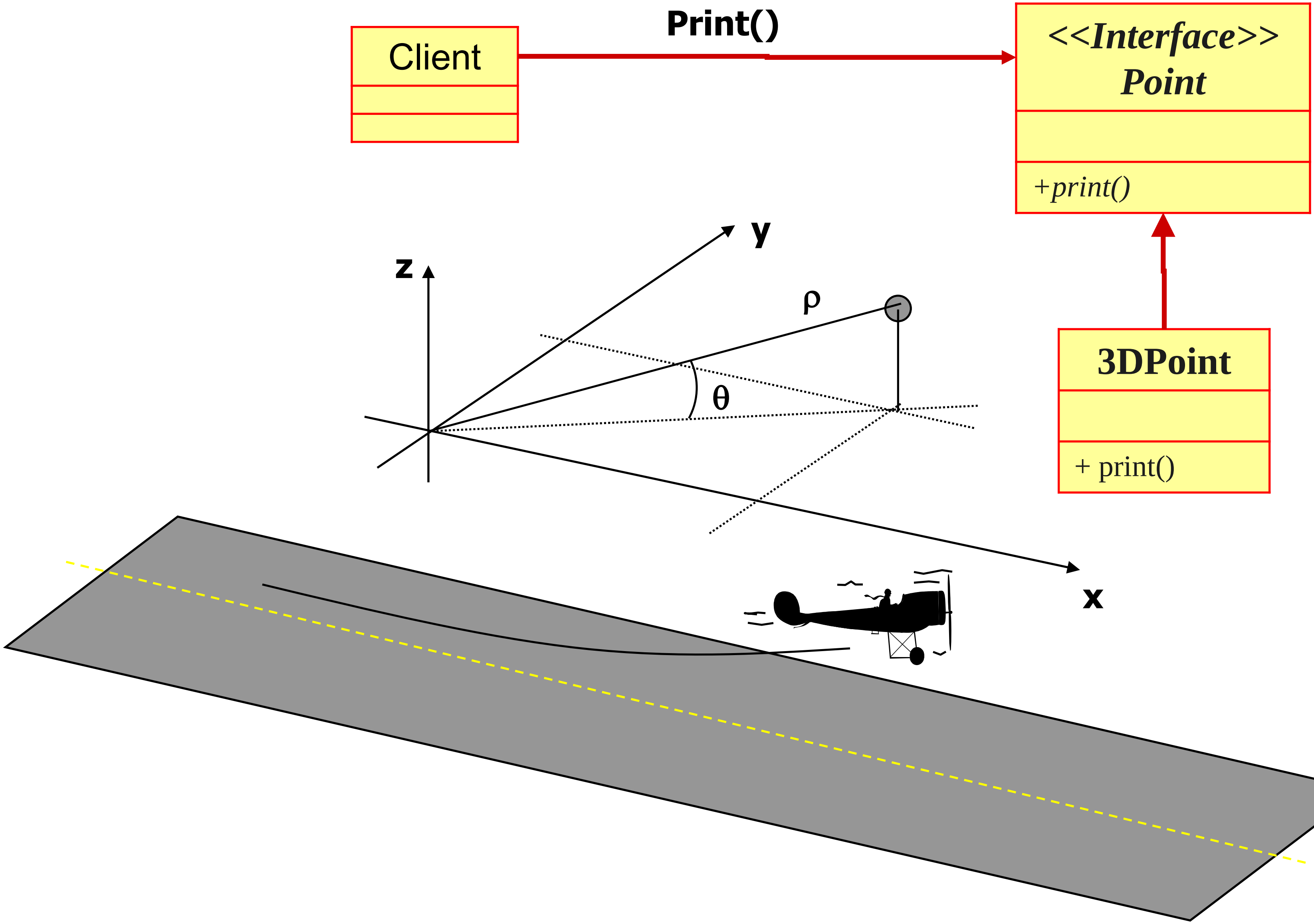
+print()

3DPoint

# int z

+ print()

Programming in “Future” tense



Client

Print()

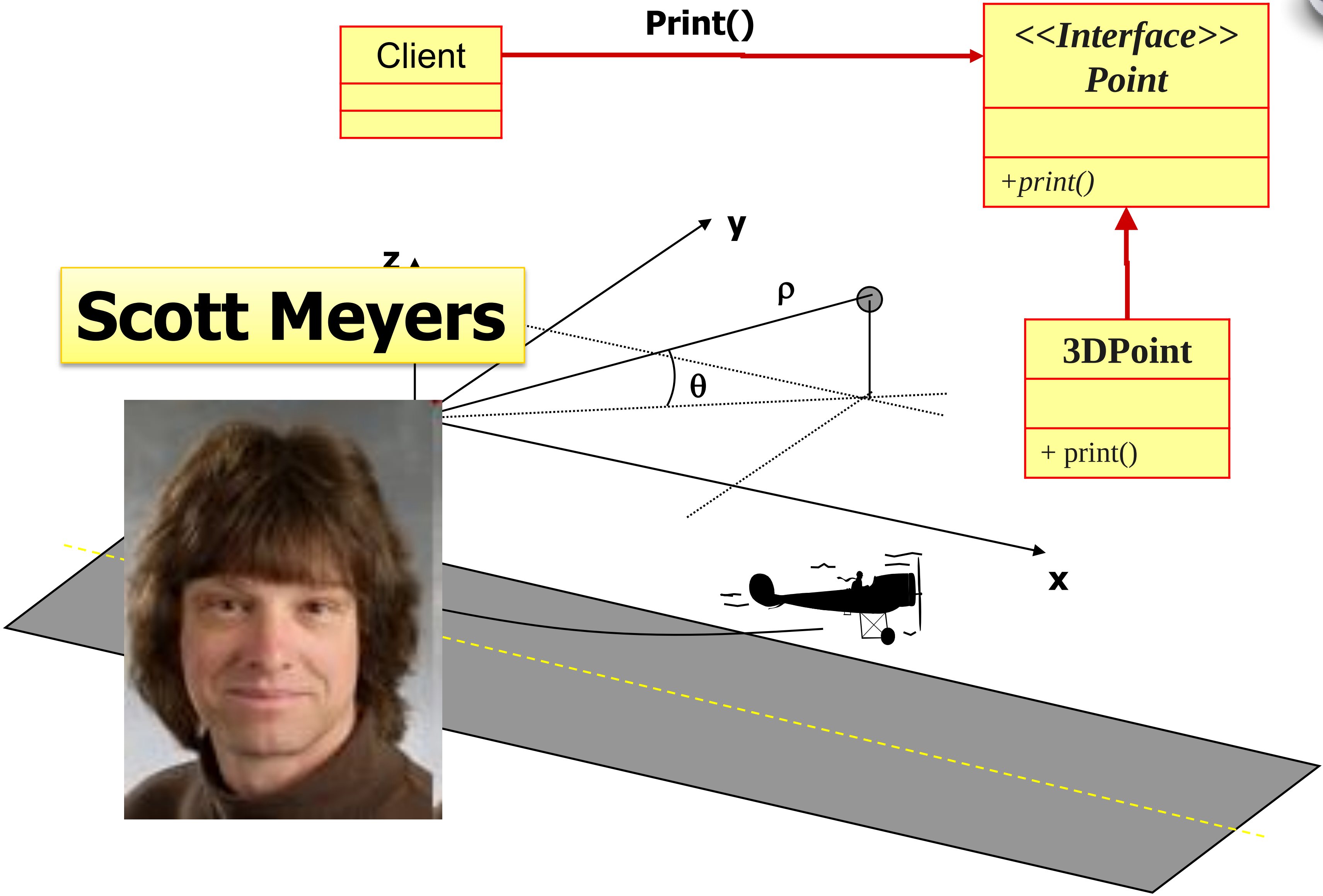
<<Interface>>
Point

+print()

3DPoint

+ print()

Programming in “Future” tense



Client

Print()

<<Interface>>
Point

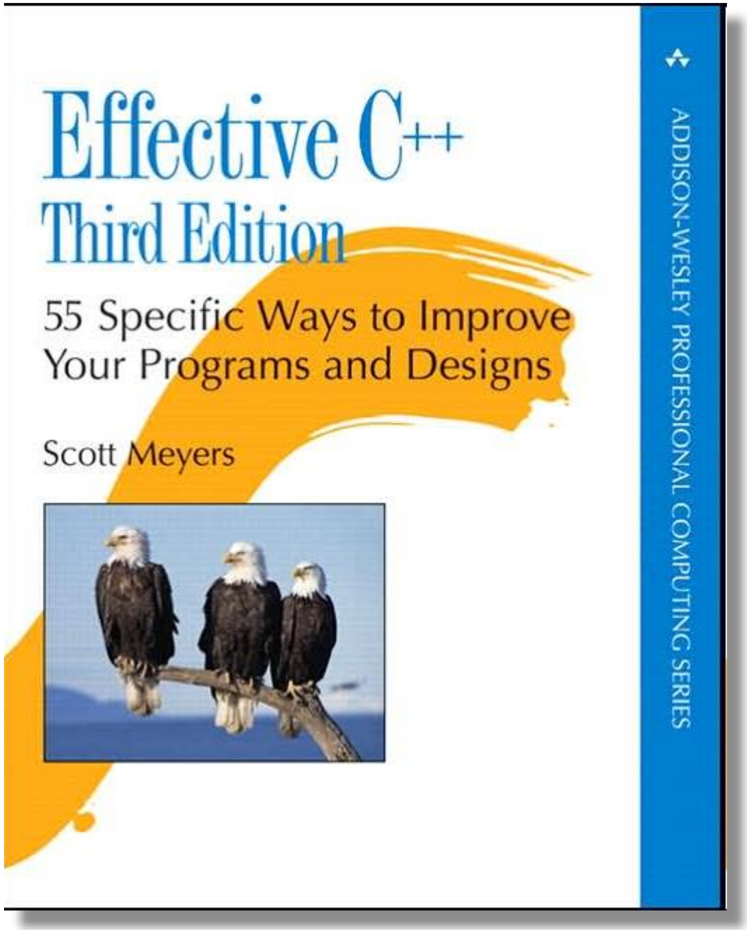
+print()

3DPoint

+ print()

Scott Meyers

Scott Meyers


Effective C++
Third Edition
55 Specific Ways to Improve Your Programs and Designs
Scott Meyers
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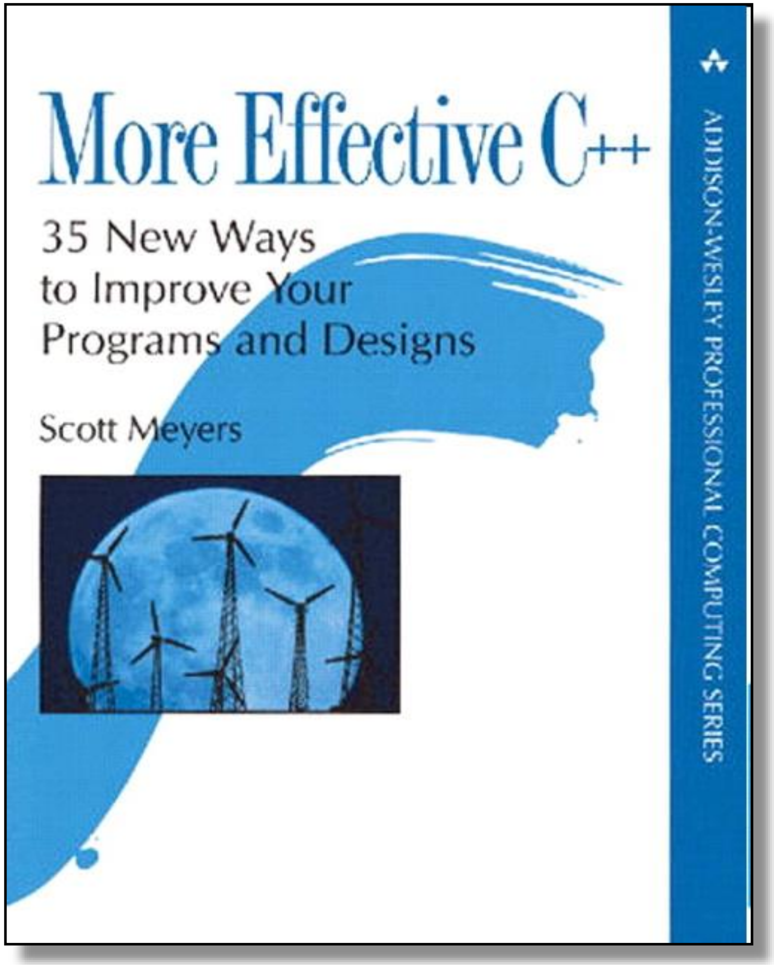
Effective C++

Scott Meyers



More Effective C++

35 New Ways to Improve Your Programs and Designs

Scott Meyers

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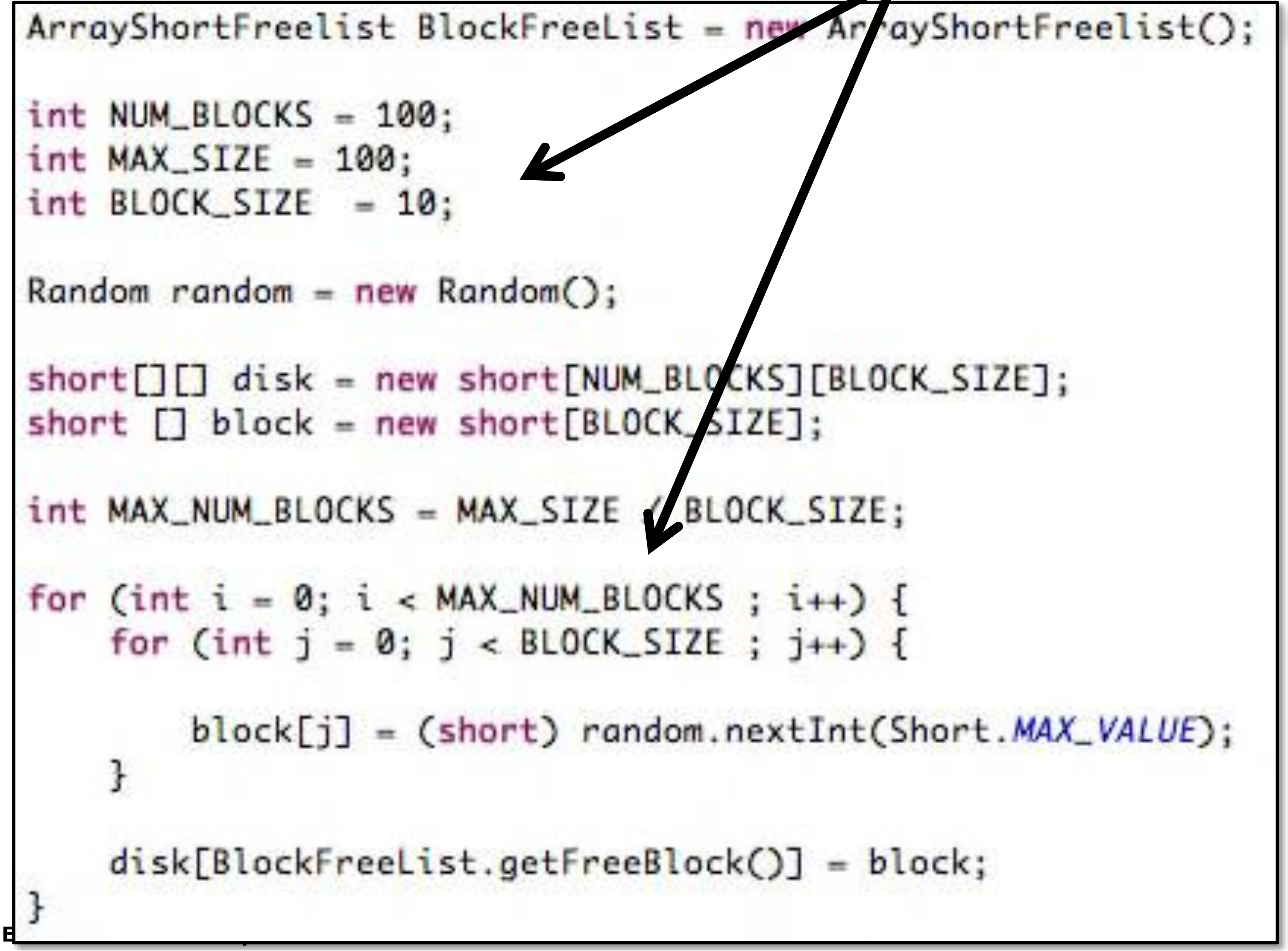
More Effective C++

Managing the changes

- Isolate Likely to Change Items :
  - Modularity : Interchange
  - No Global Items : Change Localization
  - No Hardcode Items (Magic Numbers) : Hide implementation changes
- No Assumption on Implementation !!!!!
  - Design by Interface
- Separation of Concerns
  - Business Services
  - Technical Services

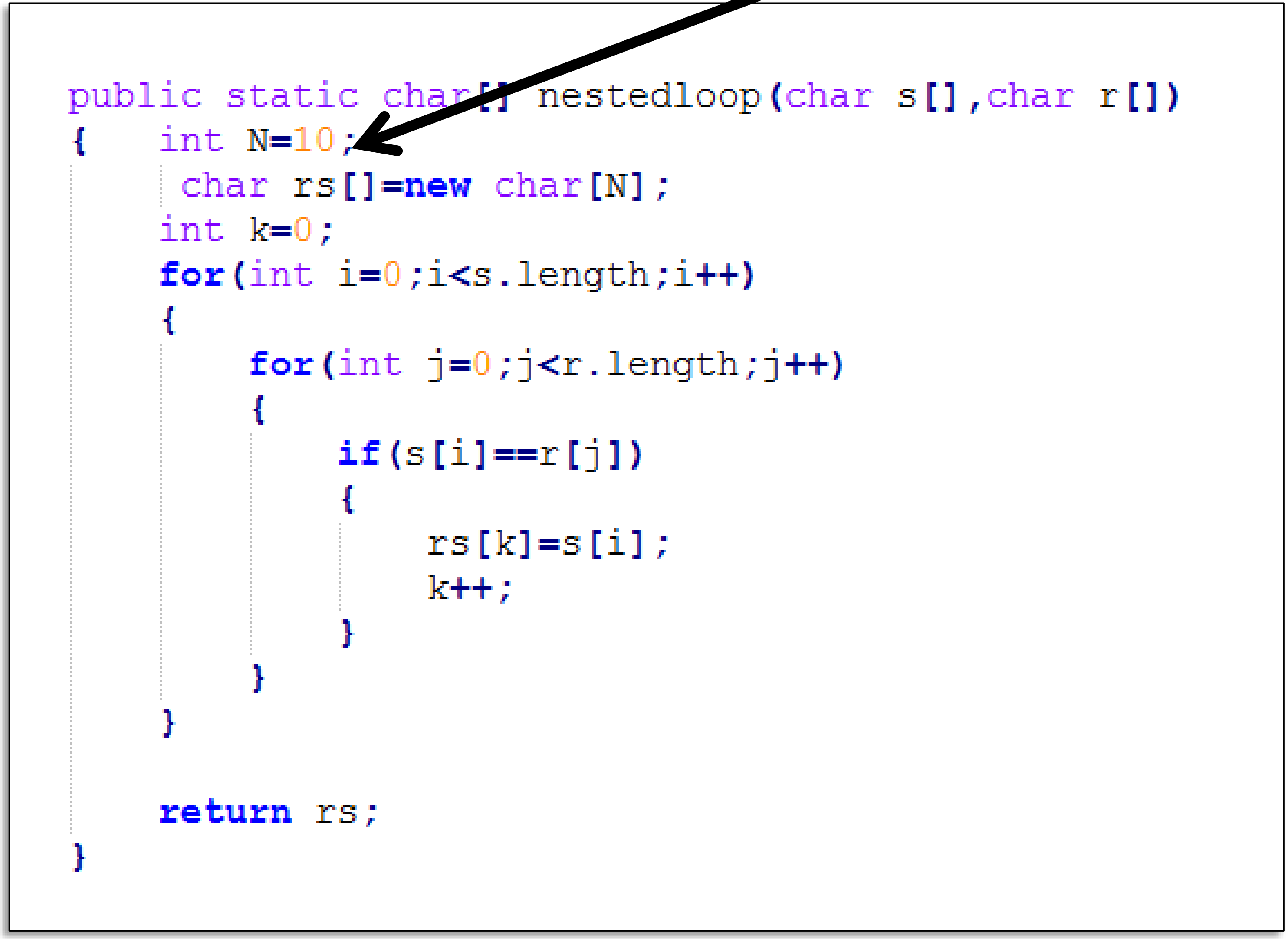
Java snippet

Pas de constantes en dur



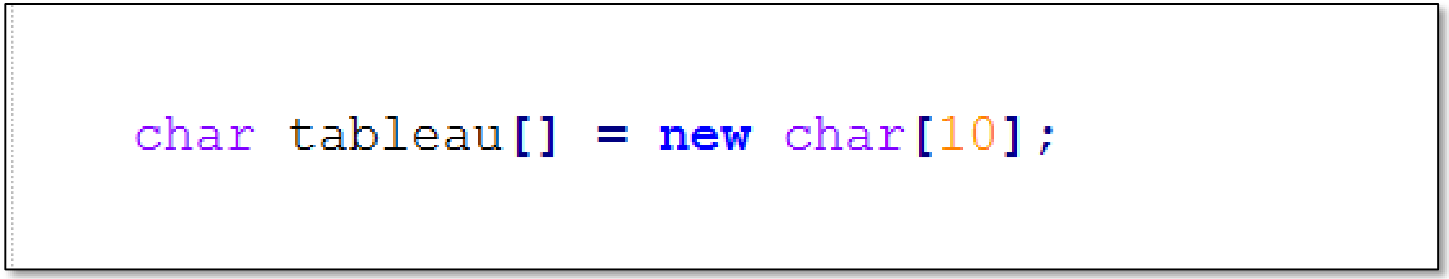
```java
ArrayShortFreelist BlockFreeList = new ArrayShortFreelist();

int NUM_BLOCKS = 100;
int MAX_SIZE = 100;
int BLOCK_SIZE  = 10;

Random random = new Random();

short[][] disk = new short[NUM_BLOCKS][BLOCK_SIZE];
short [] block = new short[BLOCK_SIZE];

int MAX_NUM_BLOCKS = MAX_SIZE / BLOCK_SIZE;

for (int i = 0; i < MAX_NUM_BLOCKS ; i++) {
    for (int j = 0; j < BLOCK_SIZE ; j++) {

        block[j] = (short) random.nextInt(Short.MAX_VALUE);
    }

    disk[BlockFreeList.getFreeBlock()] = block;
}
```

Pas de constantes en dur



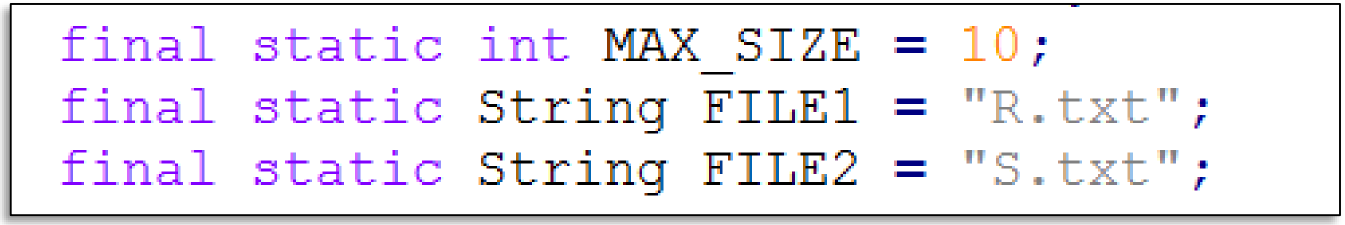
```
public static char[] nestedloop(char s[],char r[])
{    int N=10;
     char rs[]=new char[N];
     int k=0;
     for(int i=0;i<s.length;i++)
     {
         for(int j=0;j<r.length;j++)
         {
             if(s[i]==r[j])
             {
                 rs[k]=s[i];
                 k++;
             }
         }
     }

     return rs;
}
```

Constantes en dur (magic number)

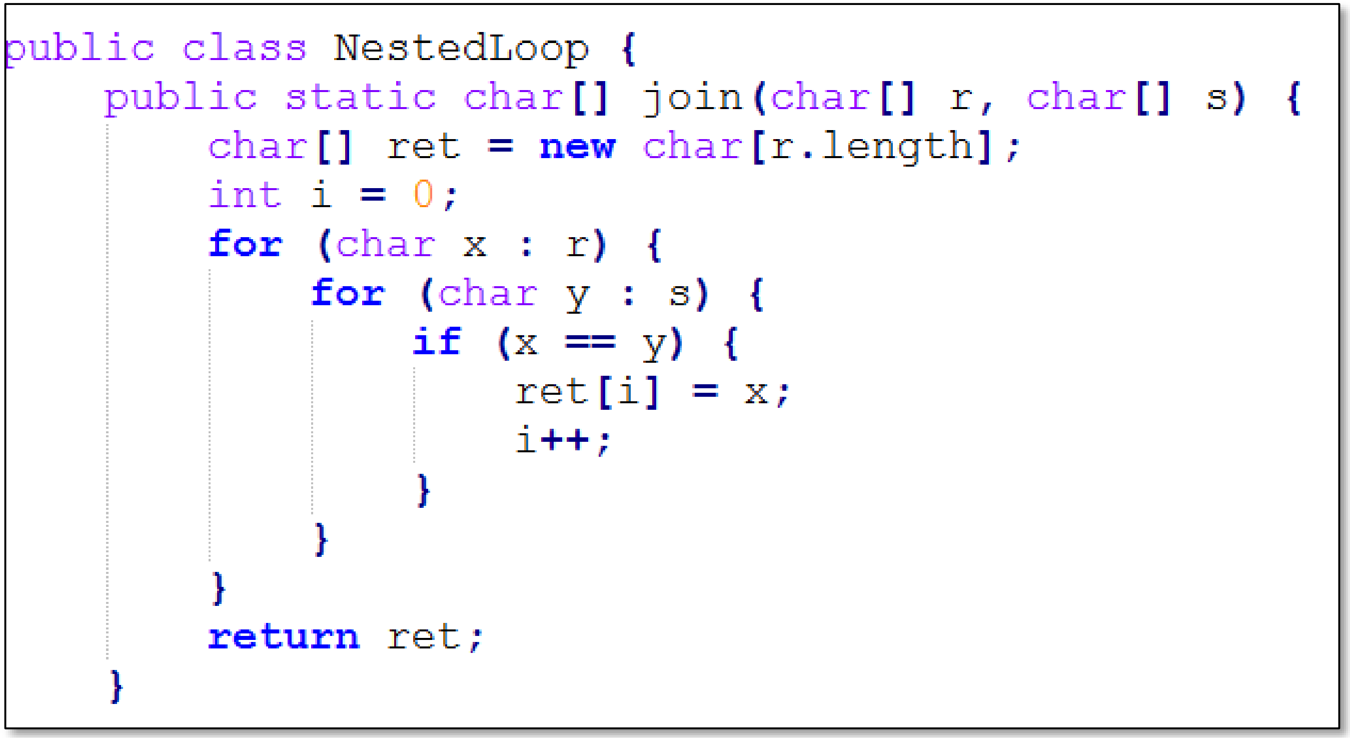


```
char tableau[] = new char[10];
```

C'est mieux !

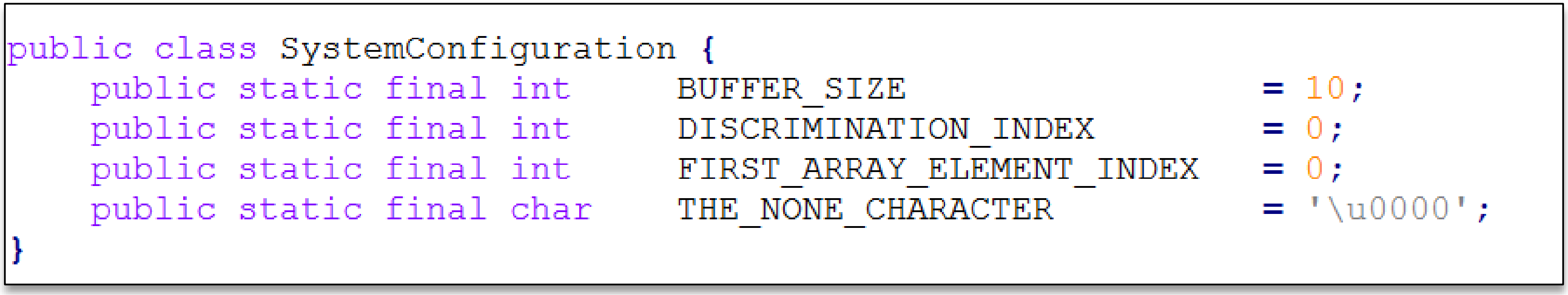


```
final static int MAX_SIZE = 10;
final static String FILE1 = "R.txt";
final static String FILE2 = "S.txt";
```



```
public class NestedLoop {
    public static char[] join(char[] r, char[] s) {
        char[] ret = new char[r.length];
        int i = 0;
        for (char x : r) {
            for (char y : s) {
                if (x == y) {
                    ret[i] = x;
                    i++;
                }
            }
        }
        return ret;
    }
```

C’ est très bien !!!



```
public class SystemConfiguration {
    public static final int     BUFFER_SIZE                 = 10;
    public static final int     DISCRIMINATION_INDEX        = 0;
    public static final int     FIRST_ARRAY_ELEMENT_INDEX   = 0;
    public static final char    THE_NONE_CHARACTER          = '\u0000';
}
```

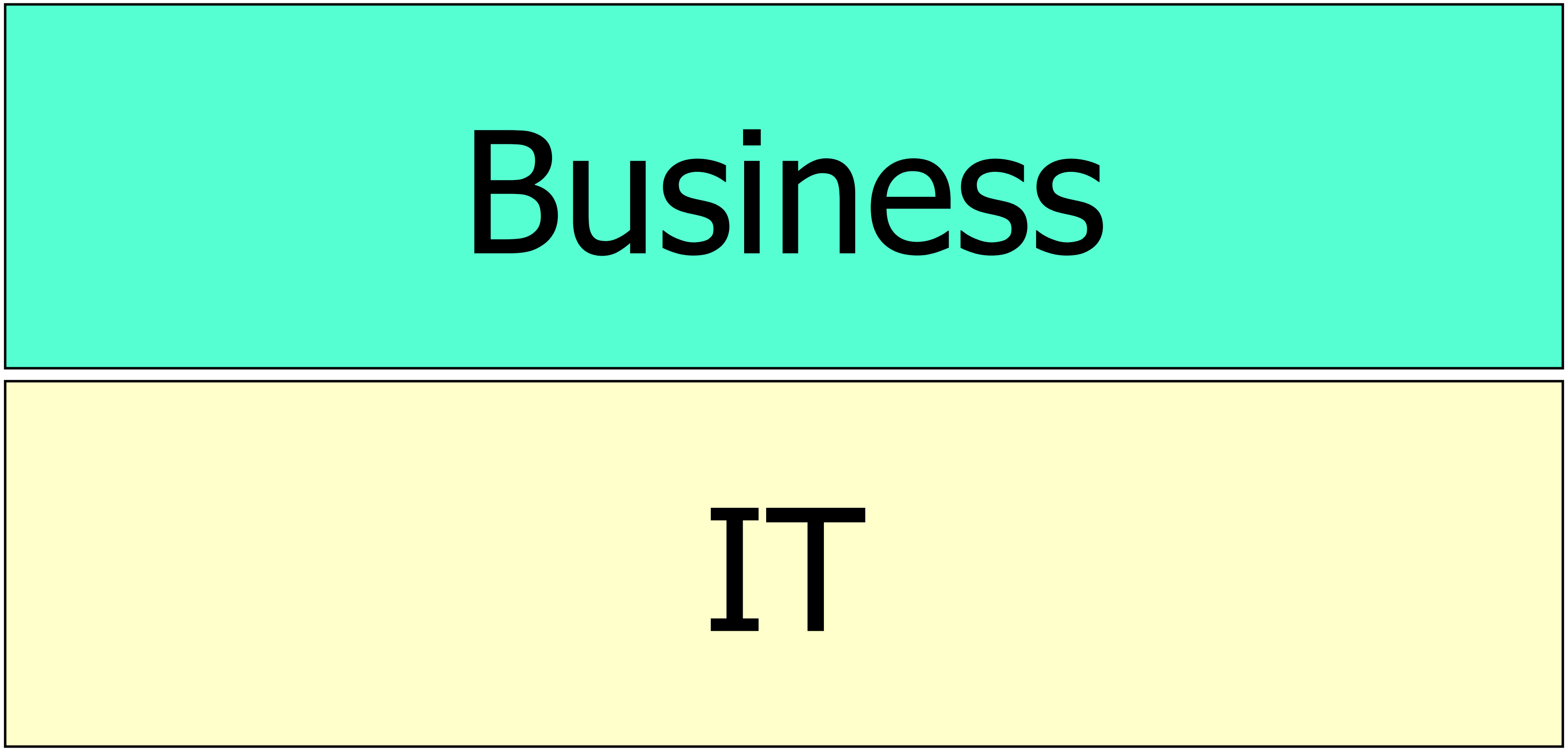
Programmer pour le futur

- Les constantes ne doivent pas être « hardcodées »

- Les évolutions sont gérées uniquement par le changement des valeurs des constantes.

- Solutions possibles : .properties, .xml, JavaBeans …

Separation of Concerns (views)

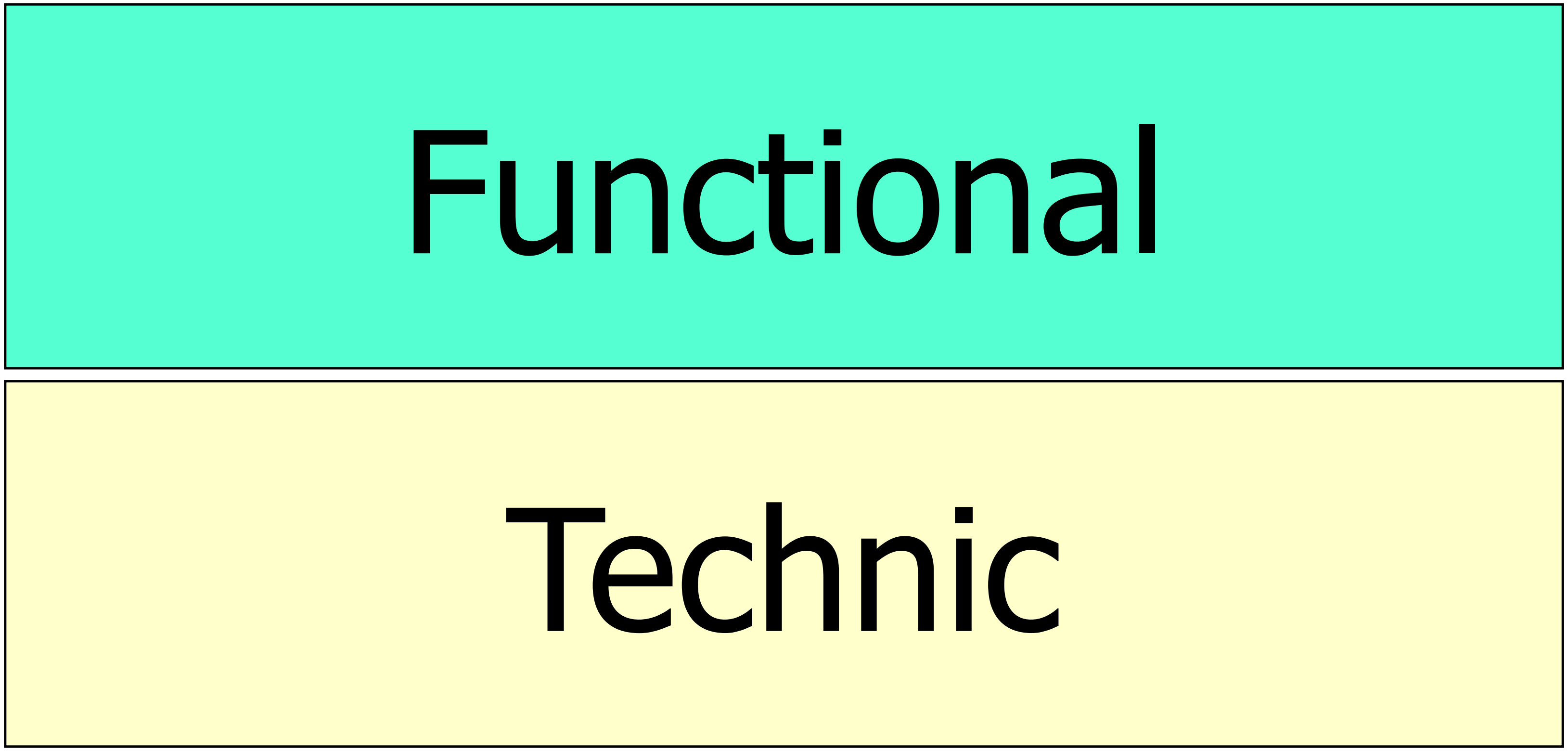


Business

IT

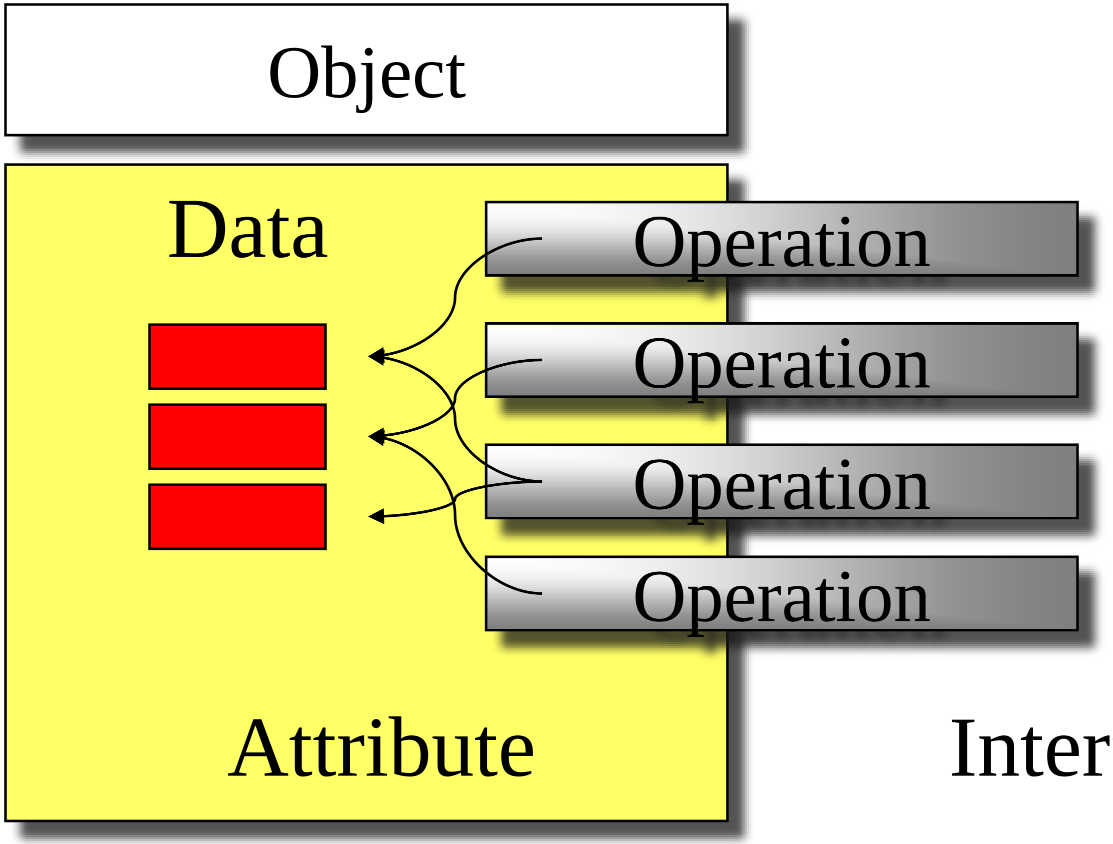
Traduction en cours

Separation of Concerns (views)

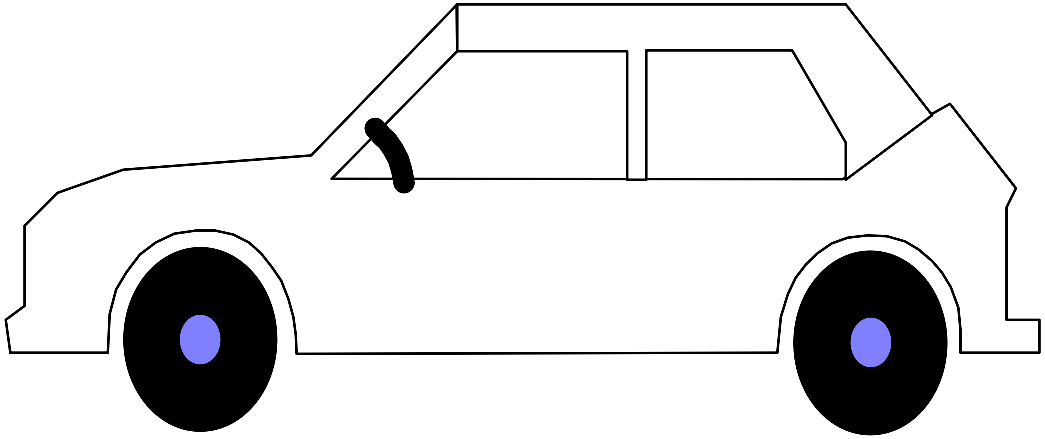

Functional

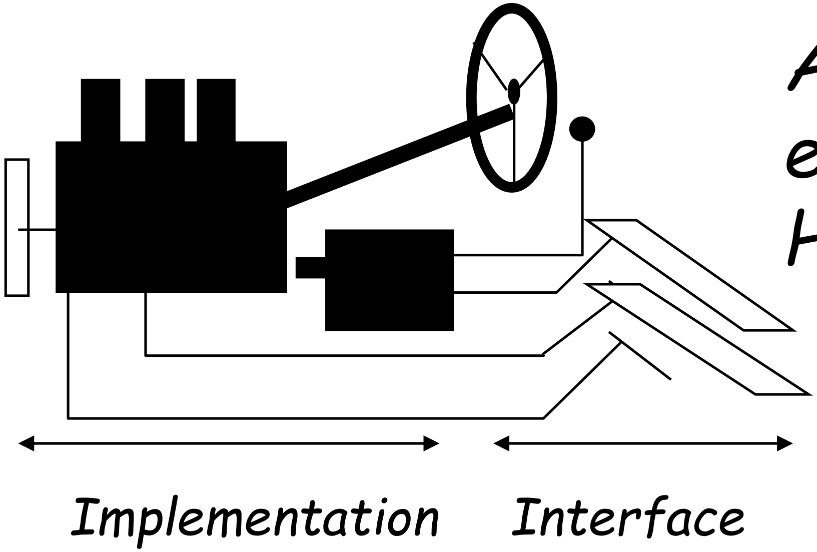
Technic

Object Paradigm



car analogy





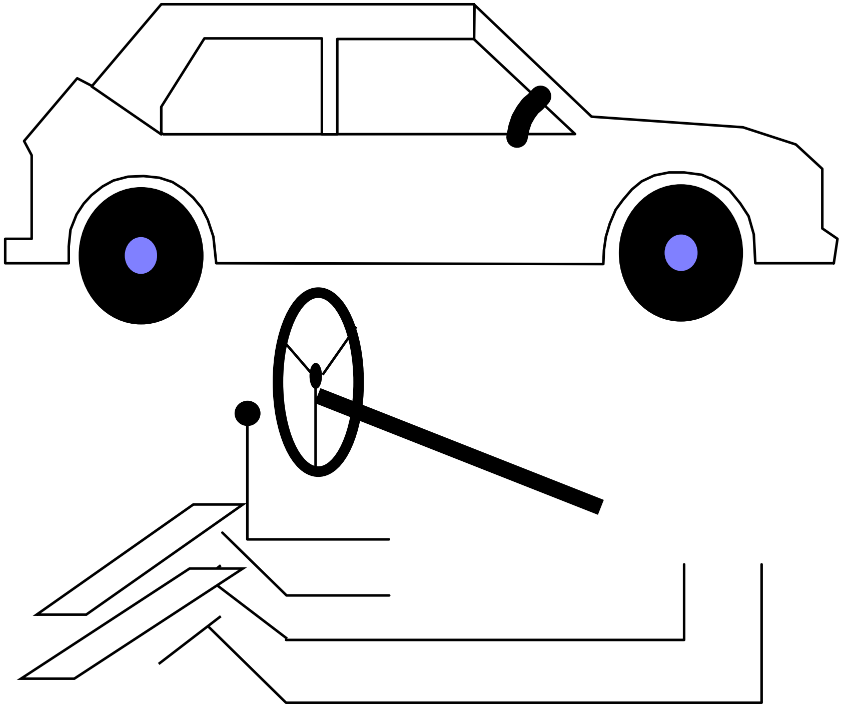
A driver doesn't care of engine's internal working. He only knows the interface

Interface

```
vehicle {

        attributes engine

        interface car {

        start()
        accelerate()
        stop()

        }
}
```

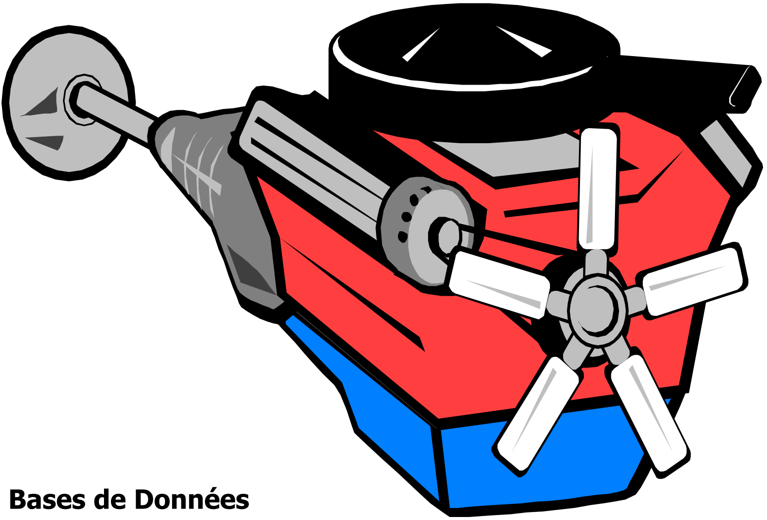
car → start()

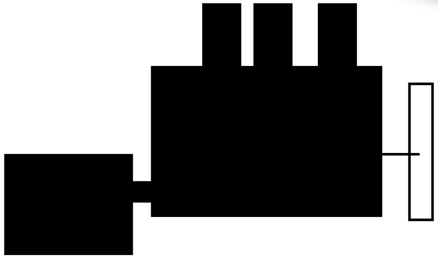
Interface VS implementation

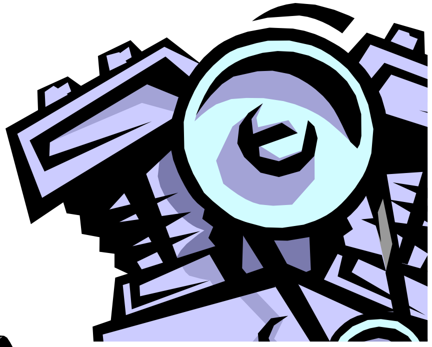


Interface

(specification)







Implementation

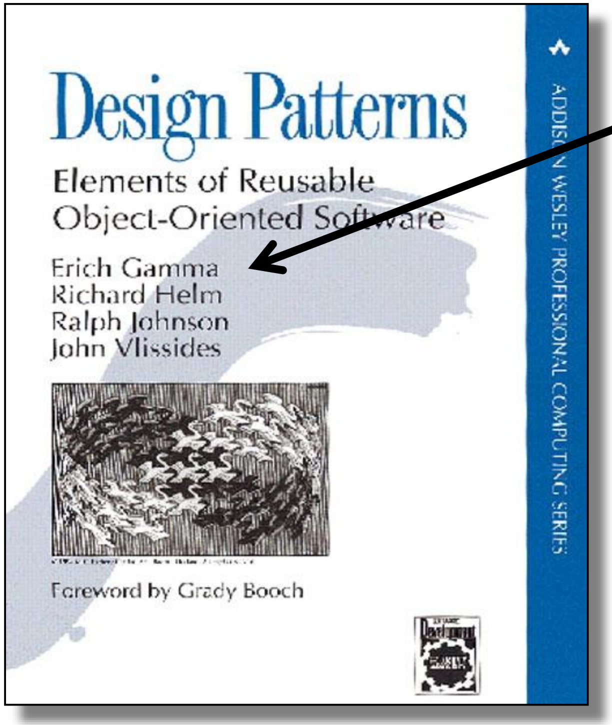
(body)

GOF

“program to an interface, not an implementation”

http://en.wikipedia.org/wiki/Design_Patterns

Moodle



Design Patterns

Elements of Reusable Object-Oriented Software

Erich Gamma
Richard Helm
Ralph Johnson
John Vlissides

Foreword by Grady Booch

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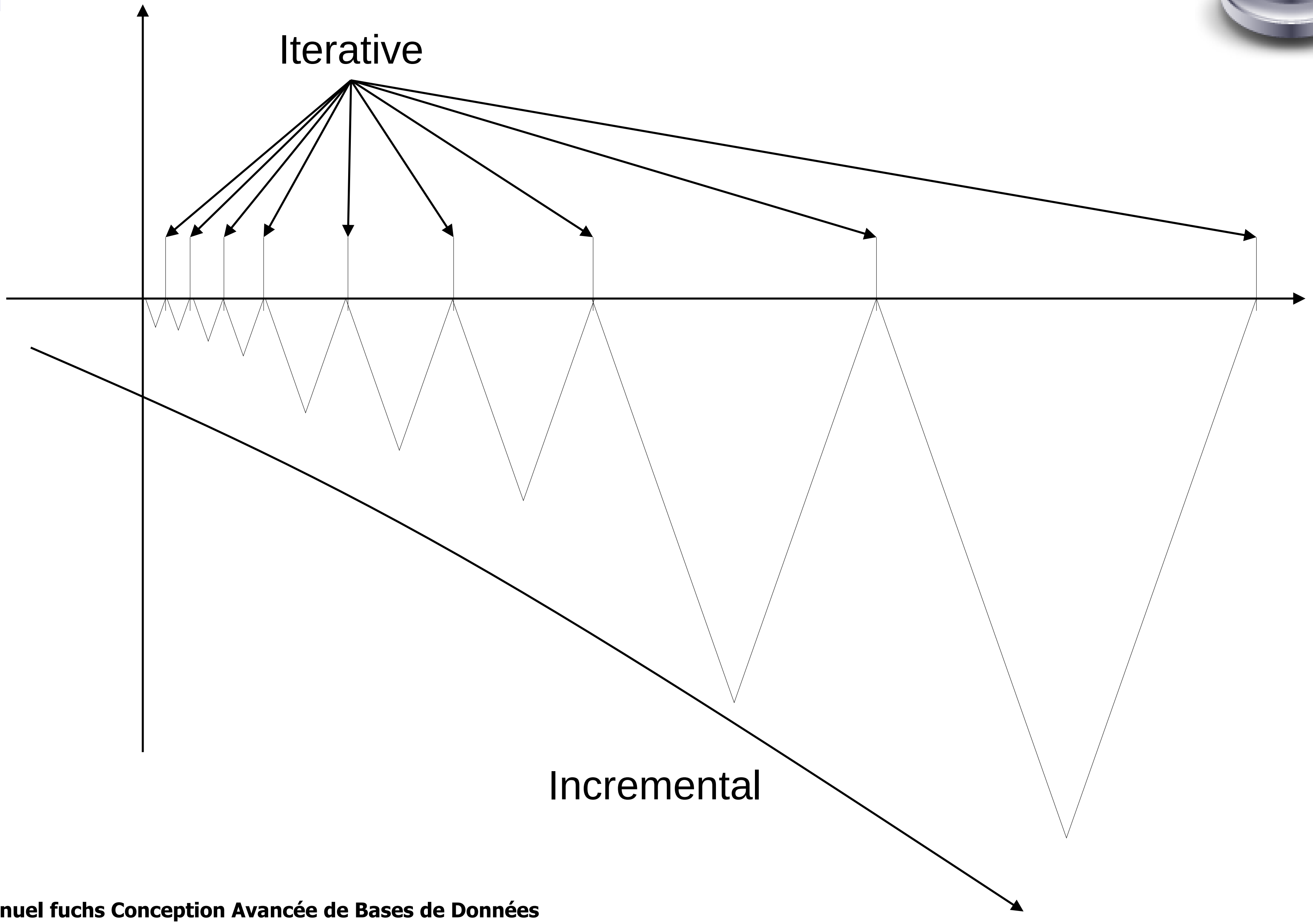
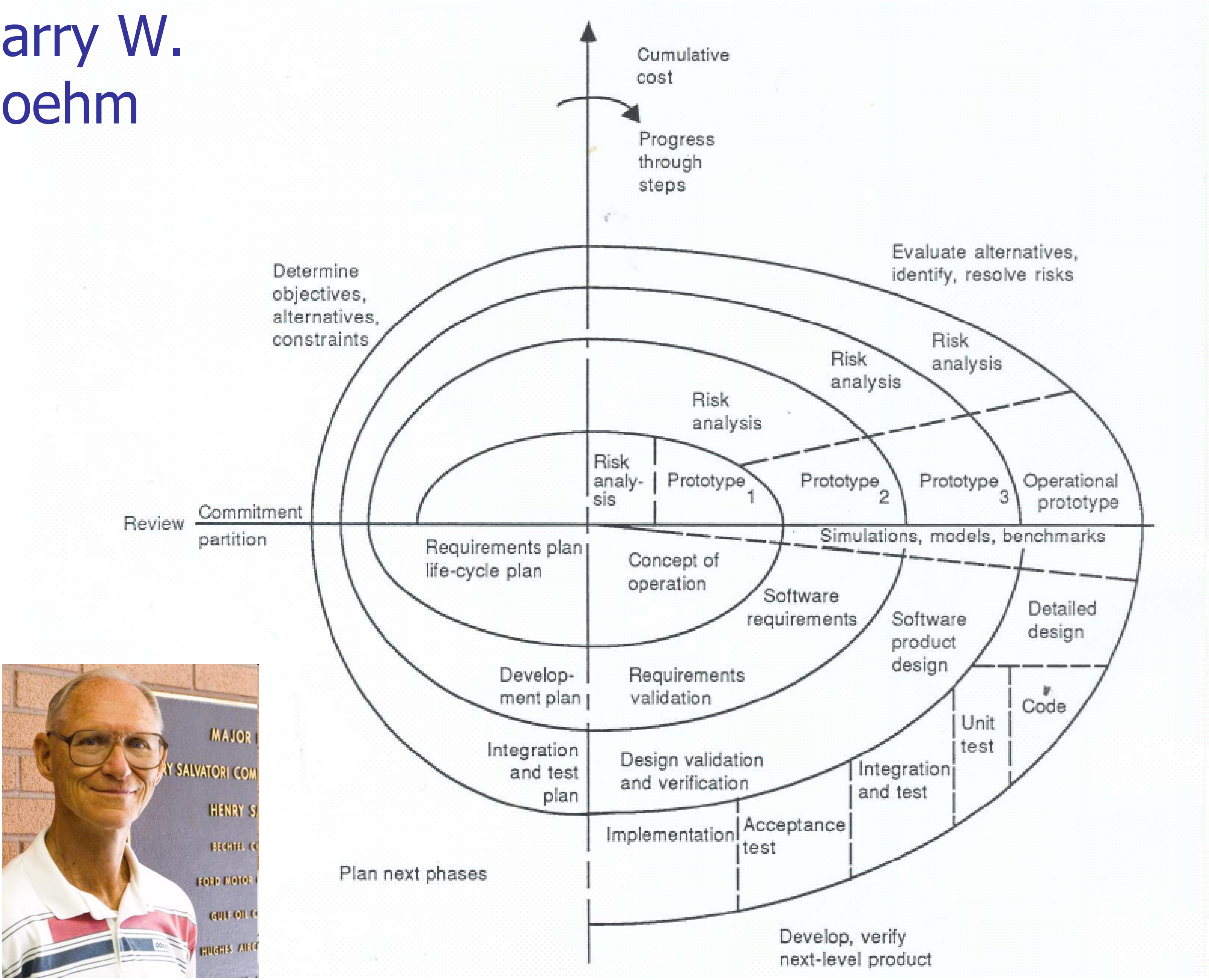
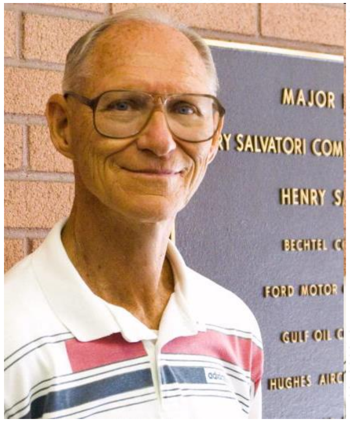
Iterative and Incremental development process

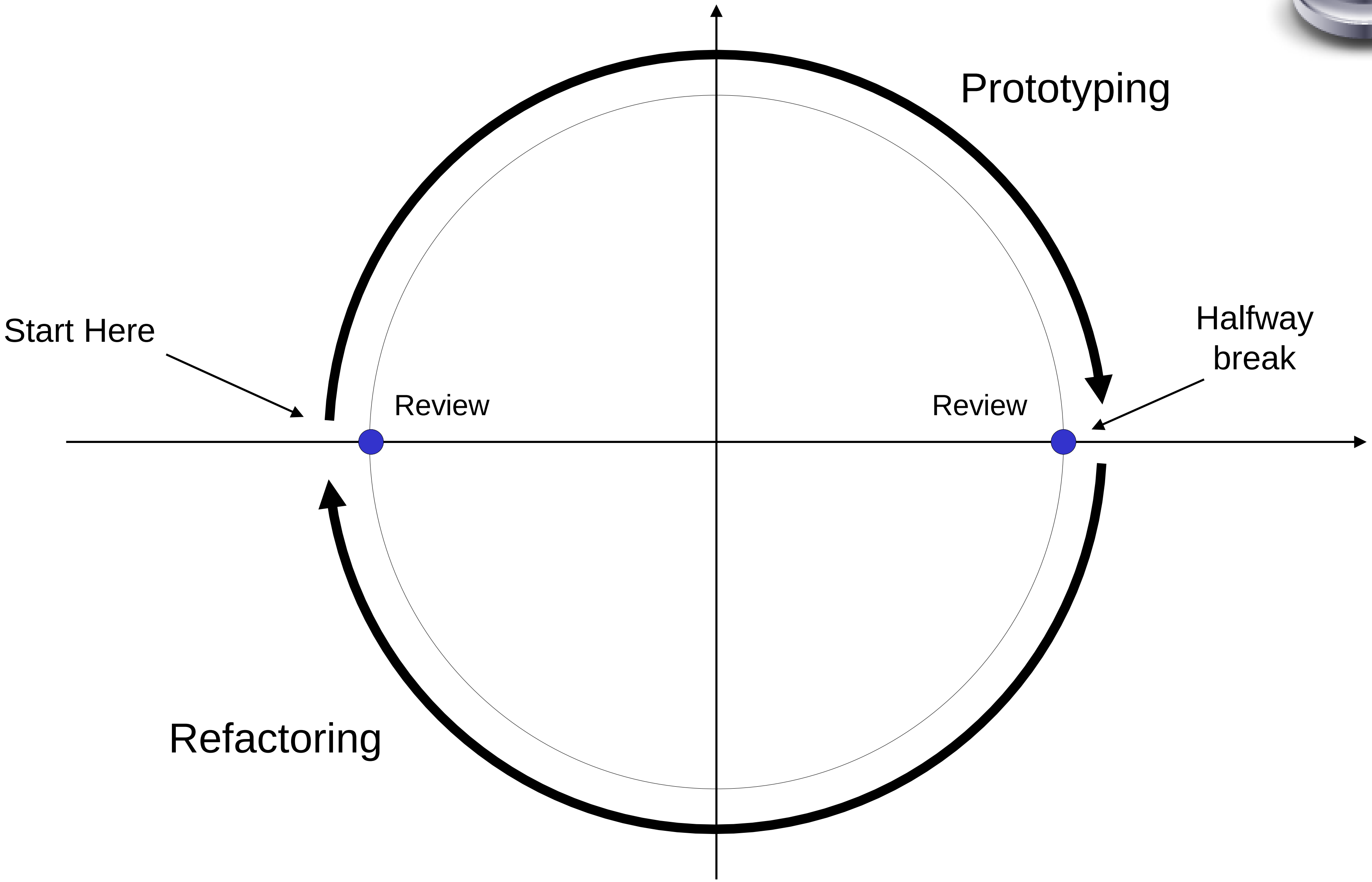


Barry W. Boehm





Use Case Prototyping Cycle


Prototyping
Start Here
Halfway break
Review
Review
Refactoring