

CS 213 : Software Methodology

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Object-Oriented Programming Languages

A Brief History of Object-Oriented Programming Languages

Which was the first object-oriented programming language?

When?

Simula-67

Ole Johan Dahl and
Kristen Nygaard (Norway)

Simula Sample <http://staff.um.edu.mt/jskl1/talk.html>

Declaration:

```
Class Rectangle (Width, Height); Real Width, Height;  
                                ! Class with two parameters;  
Begin  
    Real Area, Perimeter;  ! Attributes;  
  
    Procedure Update;      ! Methods (Can be Virtual);  
    Begin  
        Area := Width * Height;  
        Perimeter := 2*(Width + Height)  
    End of Update;  
  
    Boolean Procedure IsSquare;  
        IsSquare := Width=Height;  
  
    Update;                ! Life of rectangle started at creation;  
    OutText("Rectangle created: "); OutFix(Width,2,6);  
    OutFix(Height,2,6); OutImage  
End of Rectangle;
```

Simula Sample <http://staff.um.edu.mt/jskl1/talk.html>

Object Generation:

Ref(Rectangle) R; (Class reference variable)

...

R :- New Rectangle(50, 40); Activities involved in this object generation:

Memory allocation, reference stored to R.

Copying values to parameters (value passing only).

Starting the object's body (life rules).

The next big OOP

Smalltalk-80

Product of research led by
Alan Kay at Xerox PARC in the 70s

(Other versions of Smalltalk
preceded Smalltalk-80, but
weren't publicly released).



ALAN KAY

United States – 2003

CITATION

For pioneering many of the ideas at the root of contemporary object-oriented programming languages, leading the team that developed Smalltalk, and for fundamental contributions to personal computing.



Smalltalk-80 Sample

```
Object subclass: #Server
  instanceVariableNames: 'serverSocket socketHandler'
  classVariableNames: ''
  poolDictionaries: ''
  category: ''!

!Server class methodsFor: 'instance creation'!

new: aServerSocket handler: aHandler
| simpleServer |
simpleServer := super new.
simpleServer socket: aServerSocket.
simpleServer handler: aHandler.
simpleServer init.
^simpleServer

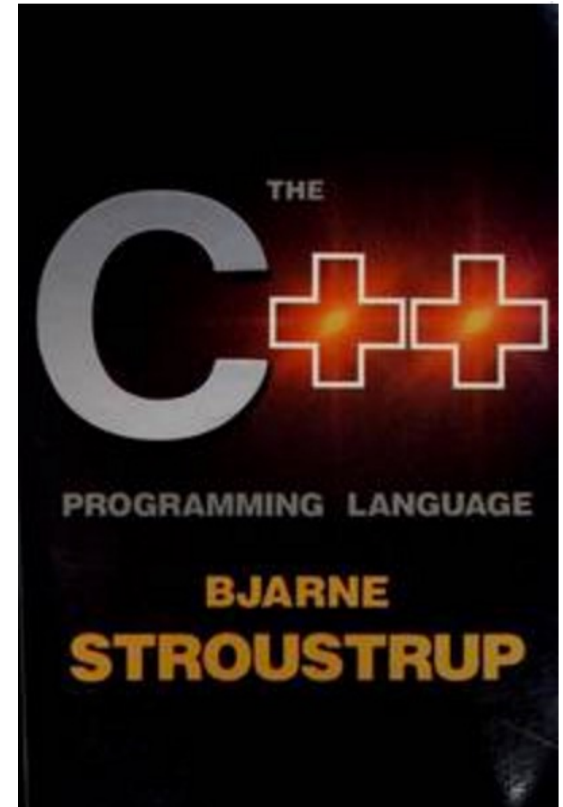
!!
```

Next up...

C++

Bjarne Stroustrup
(AT&T)

Originally implemented in 1982 under the name “C with classes”. First commercial compilers appeared in 1988



C++ Sample

```
class X {  
    private:                // the representation (implementation) is private  
        int m;  
    public:                 // the user interface is public  
        X(int i =0) :m{i} { } // a constructor (initialize the data member m)  
  
        int mf(int i)        // a member function  
        {  
            int old = m;  
            m = i;            // set a new value  
            return old;       // return the old value  
        }  
};  
  
X var {7}; // a variable of type X, initialized to 7  
  
int user(X var, X* ptr)  
{  
    int x = var.mf(7);        // access using . (dot)  
    int y = ptr->mf(9);       // access using -> (arrow)  
    int z = var.m;            // error: cannot access private member  
}
```

C++ was inspired by features of Simula, but built on top of C syntax.

The C foundation makes C++ a hybrid language: you can use a C++ compiler to compile strictly C code without any objects

And then ...

Java

James Gosling (SUN Microsystems)

Originally (early 90s) conceived as a
hardware independent software platform
to be used in consumer electronics

WORA – **W**rite **O**nce **R**un **A**n anywhere

Java 1.0 released in 1996.

JVMs available for SPARC
Solaris, Windows NT,
Windows 95, and Linux.

Supported by Netscape
Navigator 2.0 browser.

Java SE Platform at a Glance

