Programming Languages & Frameworks

Hans-Petter Halvorsen, M.Sc.
The Software Development Lifecycle

Planning

Requirements Analysis

Implementation

Design

Testing

Maintenance

Implementation
http://redmonk.com/sogrady/2015/01/14/language-rankings-1-15/
Popular Programming Languages

1 JavaScript
2 Java
3 PHP
4 Python
5 C#
5 C++
5 Ruby
8 CSS
9 C
10 Objective-C

http://redmonk.com/sogrady/2015/01/14/language-rankings-1-15/
OOP

- OOP – Object Oriented Programming
- Object-oriented programming (OOP) is a programming language model organized around "objects" rather than "actions" and data rather than logic.
- The first step in OOP is to identify all the objects you want to manipulate and how they relate to each other, an exercise often known as data modeling (UML, Class Diagrams)
- Once you've identified an object, you generalize it as a Class
- A real instance of a class is called an “object” or an “instance of a class”.
OOP

• Important features with OOP are:
  – Classes and Objects
  – Inheritance
  – Polymorphism
  – Encapsulation

• Java, Python, C++, Visual Basic .NET and C# are popular OOP languages today.

• **Simula** was the first object-oriented programming language.
  – Simula was developed in the 1960s by Kristen Nygaard from Norway (University of Oslo).
  – Since Simula-type objects are reimplemented in C++, Java and C# the influence of Simula is often understated. The creator of C++ (1979), Bjarne Stroustrup (from Denmark), has acknowledged that Simula was the greatest influence on him to develop C++. 
Erfaren og engasjert .NET Systemutvikler

søker etter en systemutvikler med lidenskap og engasjement for teknologi og programmering til vårt utviklingsteam i Bodø. Du bør ha relevant erfaring fra systemutvikling men med de rette personlige egenskapene kan du også være aktuell dersom du er nyutdannet kandidat på master-/bachelornivå.

Dette er kompetansen vi ønsker:

- Høyere utdanning på høgskole-/universitetsnivå innen IT.
- Erfaring med utvikling/modellering av SQL databaser mot fortrinnsvis MS SQL Server eller andre relasjonsdatabaser.
- Fordel med erfaring fra webutvikling på ASP.NET Webforms/MVC og Visual Studio (C#).
- Kunnskap om web teknologier som XML, Web Services.
- Kjennskap til Scrum/Kanban, Testdreven utvikling (TDD) og utvikling mot mobile enheter er et pluss.
- I tillegg til faglige ambisjoner må du være kreativ, ha evne til nyskapning og kunne jobbe i team.
- Gode norsk- og engelskkunnskaper, både muntlig og skriftlig er en selvfølge.
Programming Languages & Frameworks
Programming Languages

- C, C++
- Java
- C#
- Objective-C
- Swift
- Visual Basic, VB.NET
- Perl
- Python
- PHP
- JavaScript
- MATLAB
- LabVIEW
- ...
Integrated Development Environment (IDE)

- Programming Languages vs. IDE
- One IDE can handle multiple Languages

- C#
- Java
- Objective-C/Swift
- LabVIEW

- Visual Studio
- Eclipse
- Xcode
- LabVIEW
.NET vs. Java

http://www.youtube.com/watch?v=8Px-GHPxB4I

Java

http://www.youtube.com/watch?feature=endscreen&NR=1&v=HXvm76e2X1Q
Programming Languages

Hans-Petter Halvorsen, M.Sc.
The Visual Studio IDE is actually written in C++/C#
C

- C is a general-purpose computer programming language developed between 1969 and 1973 by Dennis Ritchie at the Bell Telephone Laboratories for use with the Unix operating system.
- C is one of the most popular programming languages of all time and there are very few computer architectures for which a C compiler does not exist.
- C has greatly influenced many other popular programming languages, most notably C++, which began as an extension to C.
- C is a procedural language, i.e. no object-oriented programming. C is a compiled language.
C++

• C++ is a compiled, general-purpose object-oriented programming language. It is regarded as an intermediate-level language, as it comprises a combination of both high-level and low-level language features.

• It was developed by Bjarne Stroustrup in 1979 as an extension to C.

• C++ is one of the most popular programming languages and its application domains include systems software (such as Microsoft Windows), application software, device drivers, embedded software, high-performance server and client applications, and entertainment software such as video games.

• Several groups provide both free and proprietary C++ compiler software.
C++

Få programmeringsspråk har hatt større innflytelse enn C++-språket til Bjarne Stroustrup. (Foto: Bjarne Stroustrup)

http://www.digi.no/932591/c-oppfinneren-tildelt-norsk-it-pris
C#

- C# is pronounced “see sharp”.
- C# is an object-oriented programming language and part of the .NET family from Microsoft.
- The most recent version is C# 4.5.1 and it is part of Visual Studio 2013.
- C# is intended to be a simple, modern, general-purpose, object-oriented programming language. Its development team is led by Anders Hejlsberg.
- C# is very similar to C++ and Java. C# is developed by Microsoft and works only on the Windows platform.
- C# is based on the .NET Framework (pronounced “dot net”).
- .NET is a software framework that runs primarily on Microsoft Windows. The .NET Framework 1.0 and C# 1.0 was released in 2002 as part of Visual Studio .NET 2002.
- Visual Studio is the Integrated Development Environment (IDE) you use when programming in C# and the .NET platform.
Objective-C

- Objective-C is a general-purpose, high-level, object-oriented programming language that is based on the C programming language.
- It is the main programming language used by Apple for the OS X and iOS and their respective APIs, Cocoa and Cocoa Touch. Apple have released a new Programming language called Swift that is the new recommended language for iOS/OSX Development.
- Originally developed in the early 1980s, it was selected as the main language used by NeXT for its NeXTSTEP operating system, from which OS X and iOS are derived.
Java

• Java is currently one of the most popular programming languages in use, and is widely used from application software to web applications.

• Java applications are typically compiled and it runs on any Java Virtual Machine (JVM) regardless of the computer architecture.

• Java is a general-purpose object-oriented. It is intended to let application developers “write once, run anywhere”.

• A common IDE for programming with Java is the Eclipse IDE.

• Java and Eclipse are used to create Android Apps.
PHP

- PHP is a server-side scripting language designed for web development but also used as a general-purpose programming language.
- PHP code is embedded into the HTML source document and interpreted by a web server which generates the web page document.
- PHP is now installed on more than 244 million websites and 2.1 million web servers, e.g., Facebook.com
- PHP can be deployed on most web servers and as a standalone interpreter, on almost every operating system and platform free of charge.
PHP
Feiret 20 år med PHP-basert webutvikling

Startet som enkel besøksstiller.
Av Harald Brombach
Publisert 13. juni 2015 kl. 08:10

http://www.digi.no/for_utviklere/2015/06/13/feiret-20-ar-med-php-basert-webutvikling
SIMPLY EXPLAINED

IS THIS A KERNEL DUMP?

NO, A STACK TRACE

Frameworks

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Programming/Software Framework

Software frameworks include support programs, compilers, code libraries, tool sets, and application programming interfaces (APIs)

- Frameworks makes it easier to create Software
- You can create your software using existing Frameworks
- If you are creating large software systems, you should in addition create your own Frameworks (code reuse, more modular, etc.)
Programming/Software Framework

- **.NET** Framework
- **ASP.NET** (part of .NET) – used for Web Development
- **ASP.NET AJAX**
- Ruby on Rails (Web Application Framework for the Ruby Programming Language)
- Cocoa Framework (Mac OS X, iOS)
- ...
- ... hundreds
.NET Framework

• A Programming Framework from Microsoft
• C#, VB.NET, Visual Studio
• CLR (Common Language Runtime)
• Released 2002
The .NET Framework (pronounced “dot net”) is a software framework that runs primarily on Microsoft Windows.

It includes a large library and supports several programming languages which allow language interoperability (each language can use code written in other languages).

The .NET library is available to all the programming languages that .NET supports.

Programs written for the .NET Framework execute in a software environment, known as the Common Language Runtime (CLR), an application virtual machine that provides important services such as security, memory management, and exception handling.

The class library and the CLR together constitute the .NET Framework.

The latest version of .NET Framework is .NET Framework 4.5.1 (included with Visual Studio 2015)
.NET Framework

ASP.NET

- ASP.NET is a server-side Web application framework designed for Web development to produce dynamic Web pages.
- It was developed by Microsoft to allow programmers to build dynamic web sites, web applications and web services.
- It was first released in January 2002 with version 1.0 of the .NET Framework, and is the successor to Microsoft's Active Server Pages (ASP) technology.
- ASP.NET is built on the Common Language Runtime (CLR), allowing programmers to write ASP.NET code using any supported .NET language.

ASP.NET is used to create dynamic web pages.

The server-side ASP.NET pages are converted on the server to HTML pages before it is sent to the client.

Client

Web Browser

HTML  JavaScript  CSS

Server-side

ASP.NET

C#/VB.NET

.NET Framework
ASP.NET – Different ways of creating Web Sites with ASP.NET

You can use (at least) 3 different approaches when creating Web Sites with ASP.NET

http://www.asp.net
Exercise – Programming

• List the Programming languages and frameworks you have been using
• What have you used them for?
REFACTORING IS KEY

NOBODY KNEW WHAT'S IN THIS BIG AND MESSY CLASS. THEREFORE WE DECIDED TO REFACTOR IT.

I JUST FIXED IT

EXACTLY

YOU RENAMED IT TO Area51?
References

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