

PROGRAMMING LOGIC AND TECHNIQUES

Professions: Programmers and analysts

Programmer professions



- A programmer is a computer scientist who specializes in the analysis and design of software using programming languages.

- Some other terms used with equivalent or similar meaning to the term “programmer”:
 - ▣ Developer
 - ▣ Software engineer
 - ▣ Coder
 - ▣ Programmer-analyst
 - ▣ Coffee drinker

Programmer professions



- There are, of course, several fields of specialization in the broad programming profession. For example:
 - ▣ Front-end developer
 - ▣ Back-end developer
 - ▣ Full-stack developer
 - ▣ DevOps engineer

Front-end developers

- A **front-end developer** specializes in the design/development of the interface with which a user interacts – the foreground of a piece of software.
- They work on the integration of visual elements and interactive elements into the application, as designed by the designers, so that users can view and interact with data.
- Front-end web developers are typically expected to be skilled in the following technologies:
 - ▣ HTML (Hypertext Markup Language)
 - ▣ CSS (Cascading Style Sheets)
 - ▣ JavaScript
 - ▣ jQuery (JavaScript library)

Back-end developers

- The work done by the **back-end developer** often goes unnoticed, because its impact on the realization of projects takes place primarily at the logical layer of programming.
- The back-end developer's impact on a project is nevertheless very significant. Without their work, the front-end layer would remain static, with no ability to retrieve any information from any data source.
- There are three key domains in which this developer will work:
 - ▣ Development of server applications
 - ▣ Development of the connection layer between applications and databases
 - ▣ Development of client applications that allow users to obtain the information requested

Back-end developers

- The most common languages for this type of programmer will vary depending on the area.
- Web development
 - ▣ Java
 - ▣ PHP
 - ▣ Ruby on Rails
 - ▣ Python
 - ▣ JavaScript
 - ▣ SQL
- Application development
 - ▣ Java
 - ▣ C/C++
 - ▣ C#
 - ▣ SQL

Back-end developers



- Mobile development
 - ▣ Java (Android)
 - ▣ Swift, Objective C (iOS)
- Low-level development
 - ▣ Assembly language

Full-stack developers



- The full-stack developer is a developer who is capable of working on both the front-end and back-end layers of an application.

Full-stack developers



- But that's not all! A full-stack developer is also capable of working on tasks at all stages of the software development life cycle, from analysis to maintenance and support after implementation:
 - ▣ Analysis (with the client)
 - ▣ Architecture (technical and application)
 - ▣ Visual (graphics, models)
 - ▣ Search engine optimization analysis (SEO)
 - ▣ Development
 - ▣ Testing
 - ▣ Configuration/installation of the product
 - ▣ Maintenance and support

DevOps



- ❑ **DevOps:** Development + Operations
- ❑ DevOps is a software development methodology that integrates the processes of development, operations, and quality assurance.
- ❑ The DevOps methodology aims to:
 - ▣ increase the speed and efficiency of development cycles and deployment cycles
 - ▣ accelerate recovery from failures and the release of fixes
 - ▣ reduce failure rates in product releases

DevOps engineers



- A **DevOps engineer** is a system administrator who has enough knowledge to support the programming team in continuous delivery of products.
 - ▣ System administration or network administration
 - ▣ Establishment of test environments
 - ▣ Application production during development
 - ▣ Communication and collaboration between the development team and the operations team

Analysts



- An **analyst** has the task of analyzing the needs of a client and/or an employer, with the goal of providing the solution(s) required given the needs expressed.
- This task is an **extremely important** step in the development process.

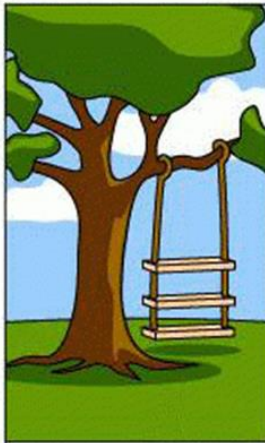
Analysts

- There are two main types of **analysts** in the field of software development:
 - ▣ **Systems analyst or technical analyst**
 - Must be able to establish what resources are required (systems or hardware) for installing an application, or to set up the network infrastructure requested by a client.
 - ▣ **Business analyst**
 - Must be able to understand the needs of clients who, for example, want to commission a development firm to computerize their business logic in the form of application tools, websites, etc.

Analysts

- This step is crucial.
- A significant amount of the problems/delays encountered during the software development process are a result of:
 - ▣ the analysis failing to take all of the client's needs/requests into consideration, or
 - ▣ the analysis failing to properly understand the client's needs.
- The analyst's goal is not only to translate and pass on the requests of the client. Their goal is also to offer the client effective solutions in order to maximize the effectiveness of the final product, in an effort to provide the client with the product that is best suited to their needs.
- In short, clients rarely know what it is that they really need:

Analysts



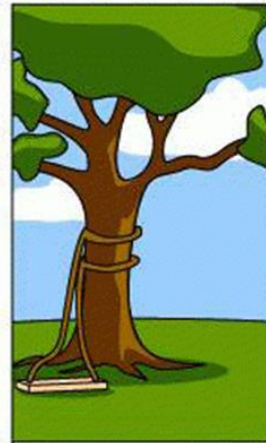
How the client explained it



How the project manager understood it



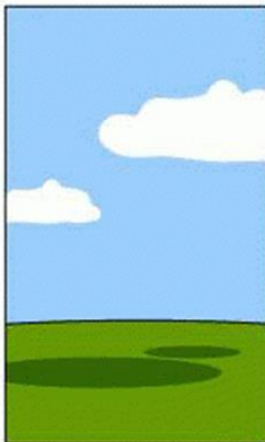
How the analyst designed it



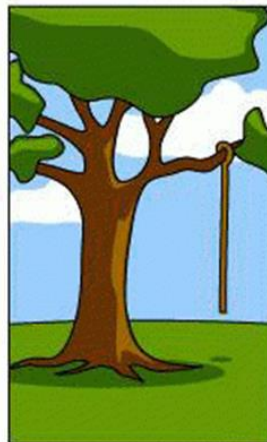
How the programmer wrote it



How the business consultant described it



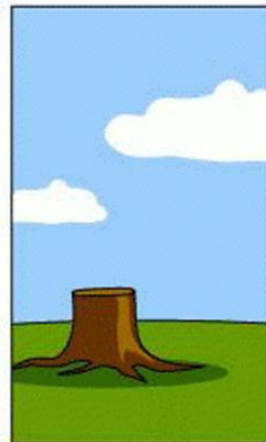
How the project was documented



What the operations team installed for the client



How the client was billed



How technical support was provided



What the client really needed

Other development-related professions



- ▣ Project managers
- ▣ Systems integrators
- ▣ Graphic designers
- ▣ Graphic artists
- ▣ Software designers
- ▣ User experience (UX) designers
- ▣ Marketing managers
- ▣ System administrators
- ▣ Network administrators
- ▣ Database administrators

Montreal is a great place to start your career

- Many networking opportunities: CS Games, ConFoo Developer Conference, Startup Drinks at Notman House, Hackathons, Code in the Dark, Game Jam, CodeJam, Tech Fairs, etc.
- Many tech employers have offices in the city: Microsoft, Ubisoft, Google Brain team, Facebook AI lab, Genetec, etc.