BM 4302 Medical Image Processing
Configuring CMake for ITK and Essential System Concepts

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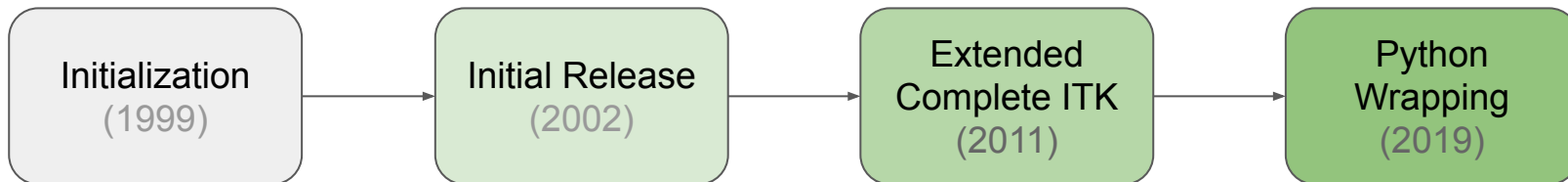
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ITK, and its Historical Overview

ITK

- An Open-source, Object-oriented software system for, Image processing, segmentation, and registration.
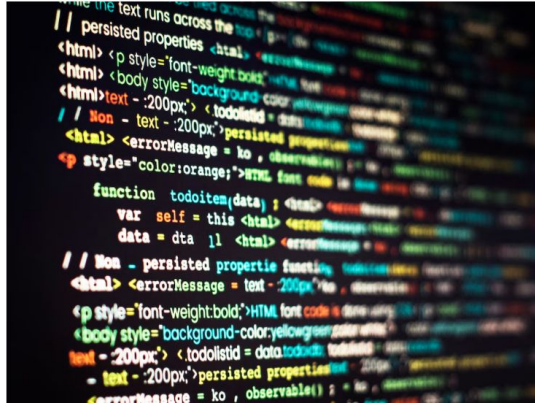
Historical Overview

| Initialization (1999) | → | Initial Release (2002) | → | Extended Complete ITK (2011) | → | Python Wrapping (2019) |

What is CMake ?

Pizza ?? → Pizza Hut → Customized Pizza

What is CMake ?

Source Codes ———————→ CMake ———————→ Happy Programming!!!
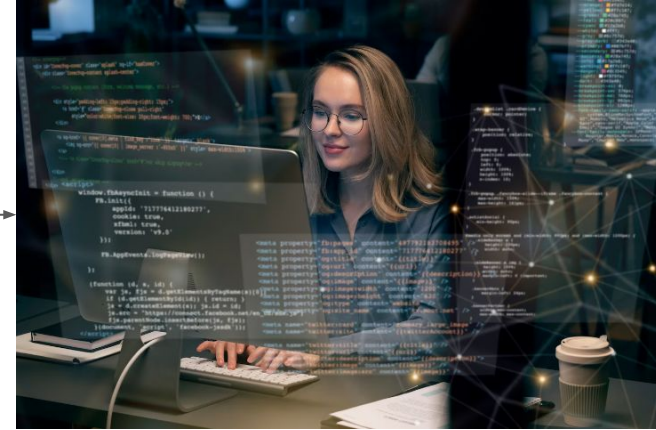
Configuring ITK Using CMake

- Preparing CMake and gathering source codes.
- Configuring ITK
  - Basic configuration
  - Advanced configuration with Modules and Groups
  - Generating build files
  - Compiling
- Building first programme
- Other installation methods
- Wrapping for Python

Other Installation Methods

- Using package managers.

```
sudo apt-get install libinsighttoolkit5-dev

brew install itk
```

- Wrapping for Python

```
python -m pip install --upgrade pip
python -m pip install itk
```

Basic System Concepts

- Generic Programming

  - Writing a code that works for any data types.

- Smart Pointers

  - Smart pointers are used to manage the lifetime of dynamically allocated objects

- Exception Handling

  - Handling errors during the execution of the program

- Event Handling

  - Allowing to trigger custom actions in response to certain events like progress updates.

- Multithreading

  - Running multiple threads in parallel

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Resources

ITK Documentation: https://docs.itk.org/en/latest/
ITK Software Guide: https://itk.org/ItkSoftwareGuide.pdf

CMake Documentation: http://www.cmake.org/
Publicly Available Test Data: https://github.com/InsightSoftwareConsortium/
https://www.nlm.nih.gov/research/visible/visible_human.html
public.kitware.com/pub/itk/Data/