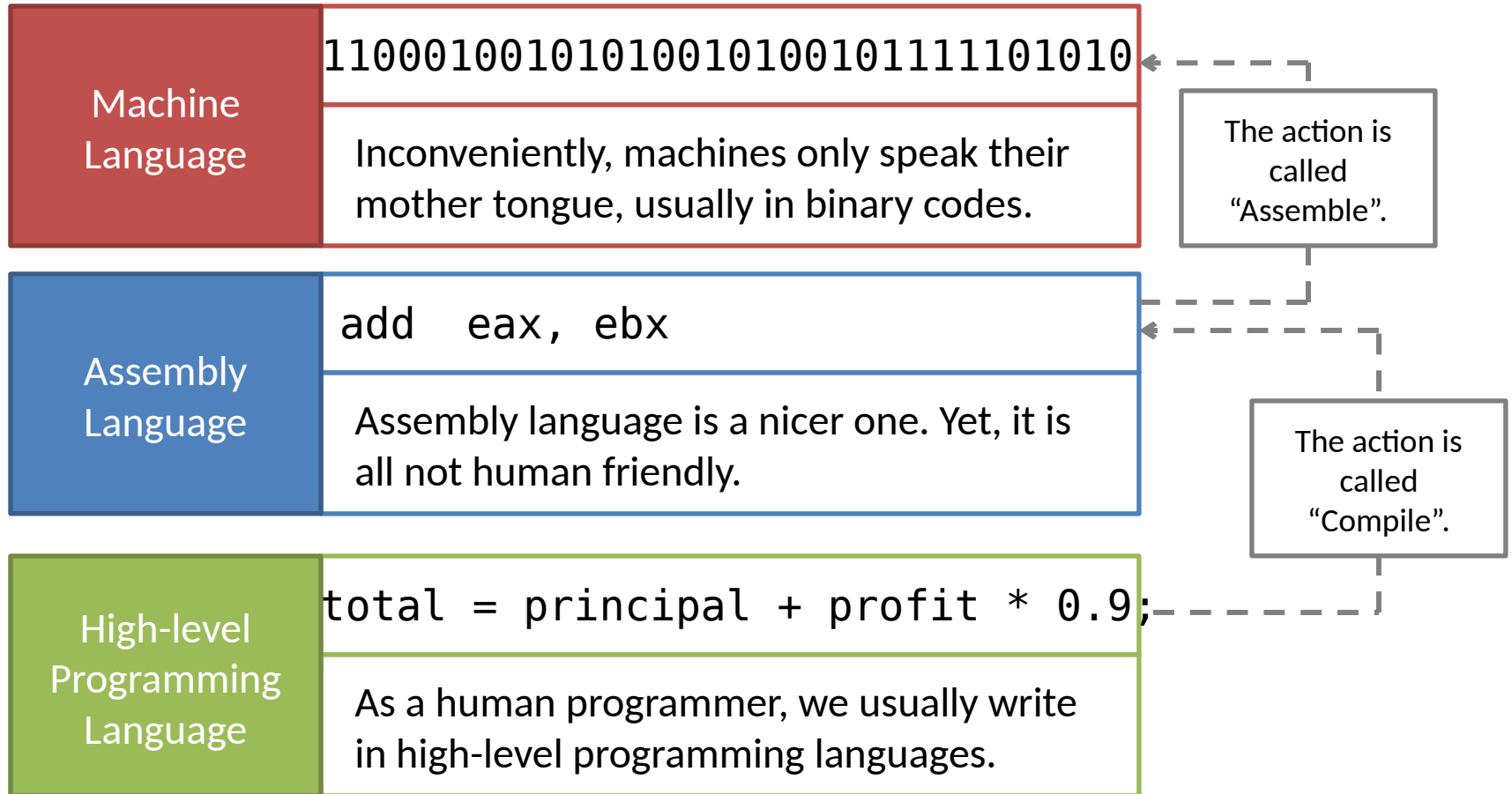


Introduction to Programming

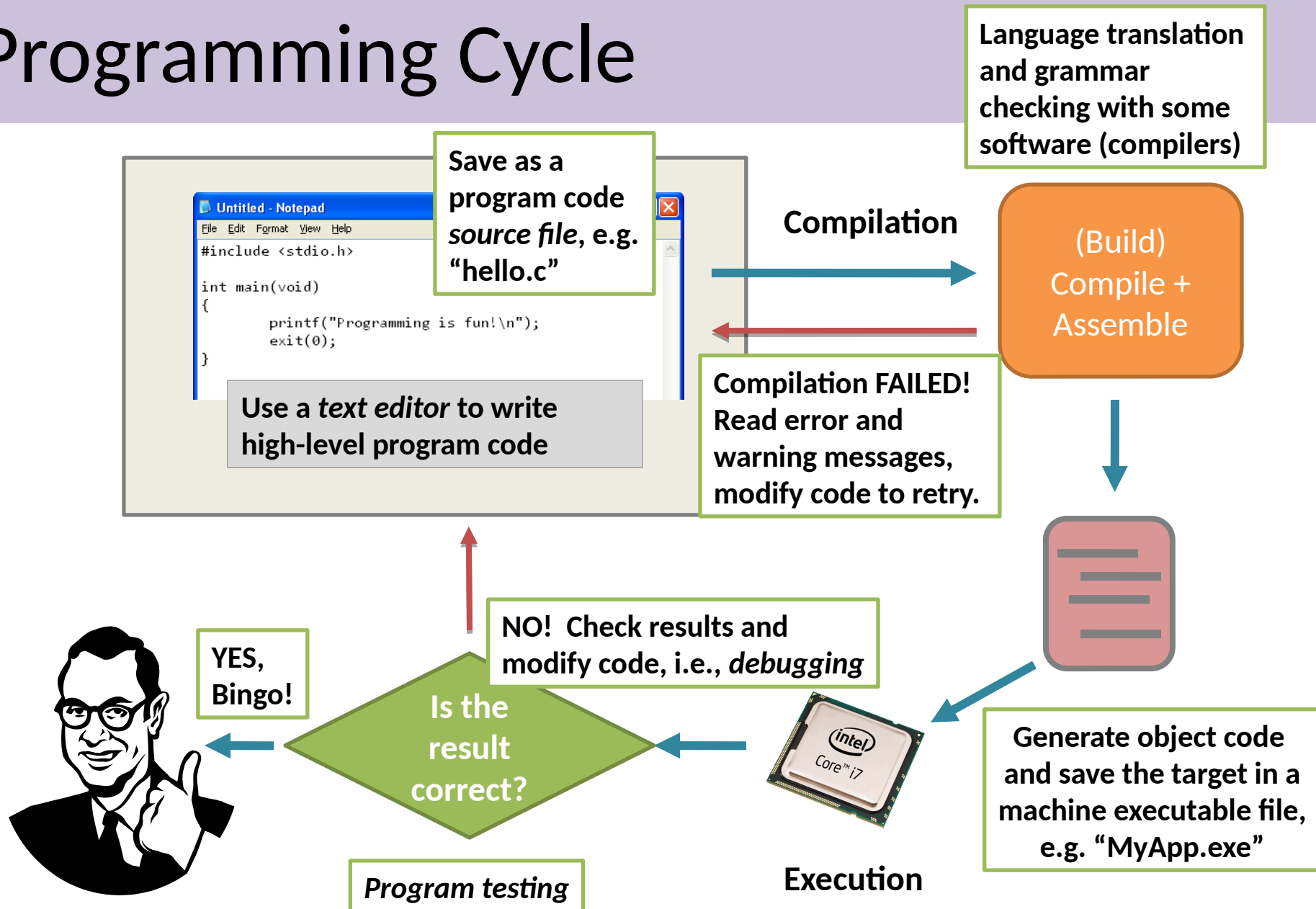
What is Programming?

- **Computer** – A **machine** that processes **data** according to **instructions**
 - E.g. PC, smartphone, mainframe, game console, ...
 - Data: user inputs, text, keystrokes, audio, video, etc.
 - Instructions: programs, apps, etc.
- **Computer Program** – A set of instructions that tells a computer how to process data
- **Programming** – Writing sets of instructions in some *languages* that tell computers what to do

Programming Languages



Programming Cycle



Fundamentals of Programming

- Understand the basic concepts and principles of programming
- Understand and *memorize* the syntax of a programming language
- Turn your idea/solution into equivalent instructions
- Know what APIs (Application Programming Interface) are available and learn how to use them

Why Learn Programming?

- This course is compulsory for all engineering students. Why?
- Why do I need to learn **programming**?
- Is this course *only* important to those who want to study Computer Science?
 - The answer is NO

Why Learn Programming?

- Maybe you are interested in...
 - Internet-of-Things, Embedded Systems
 - Enterprise Systems, e-Commerce
 - Fin-Tech, Blockchain, Mobile Payment Systems
 - Biomedical and Environmental Innovations
 - Network Security, Big Data, Cloud Computing
 - Robotics, Artificial Intelligence, Game Industry
- In all these wonderful and exciting engineering frontiers, **software** is a crucial component
- **Programming** is crucial to the creation of **software**

Why Learn Programming?

- Learning **programming** well will benefit your future study in your future courses in ANY department major programs
- So please work hard in this course!

Our Tool – Repl.it

- An online platform, great for learners!
- You can practice programming as long as you have a browser (preferably on Chrome, PC/Mac)
- No excuses not to practice programming!
- We will introduce the tool in detail later

Other Programming Tools

- Visual Studio Community (Advanced)
 - An Integrated Development Environment (IDE)
 - Editor + Compiler + Debugger + Other development tools
 - VS Community Edition is free to download
 - Sign in using CUHK CWEM Microsoft O365 account
 - More tools from Microsoft
 - <https://visualstudio.microsoft.com/free-developer-offers/> (Free!)
 - Sign up with CUHK CWEM email address, or consult ITSC website
 - Not needed to do your lab exercises

Reading Assignment

- C: How to Program, 8th ed, Deitel and Deitel
- Chapter 1 Introduction to Computers
 - Sections 1.1 – 1.5, 1.9