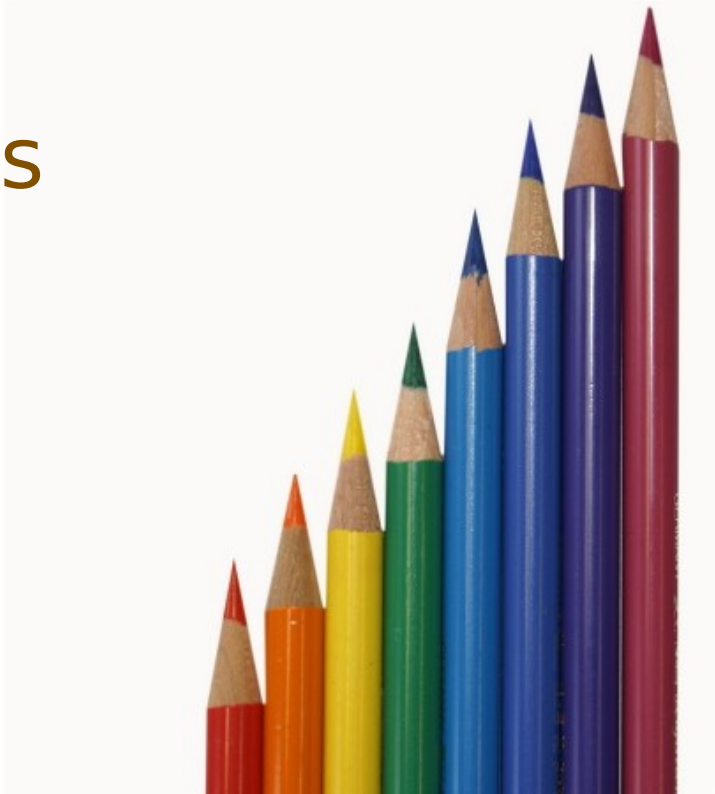
Intro to Computer Science

Introductory Class



First

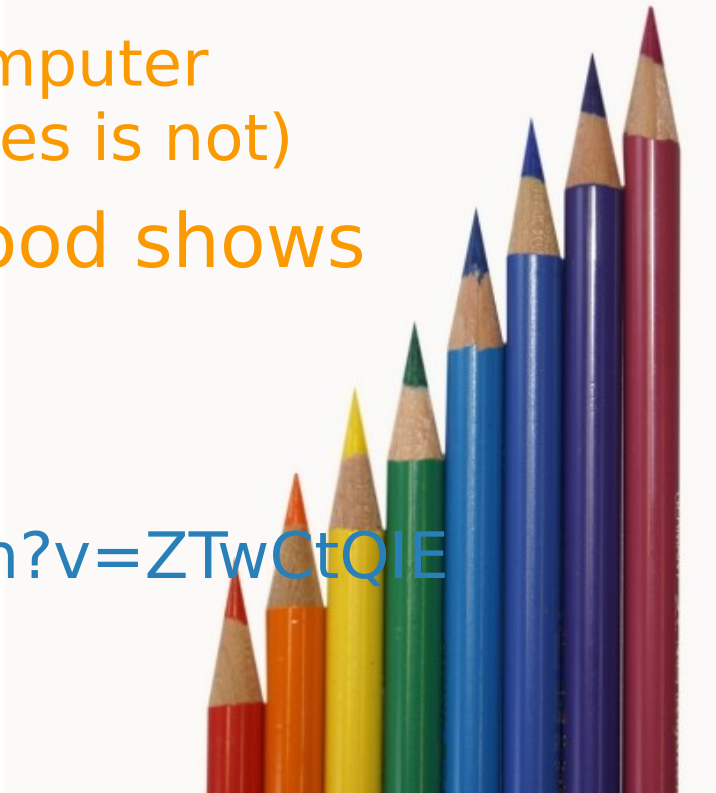
- Syllabus
  - Lets look at the outline
- Reverse Roll Call
  - Lets see who is here

Expectations

- So what is Computer Science?
  - An Architectural Discipline
    - Building Software
      - Design
      - Programming
      - Algorithms selection
    - Building software/hardware systems
      - “DevOps”
      - Internet of Things
    - Securing these systems
      - Including forensics and pen testing

Expectations II

- What is *NOT* Computer Science?
  - Computer hardware repair
  - Web page design
    - (making dynamic webaps is computer science – but layout of static sites is not)
  - Pretty much anything Hollywood shows about “computer people”
  - Effectively parodied here
    - https://www.youtube.com/watch?v=ZTwCtQIEswM



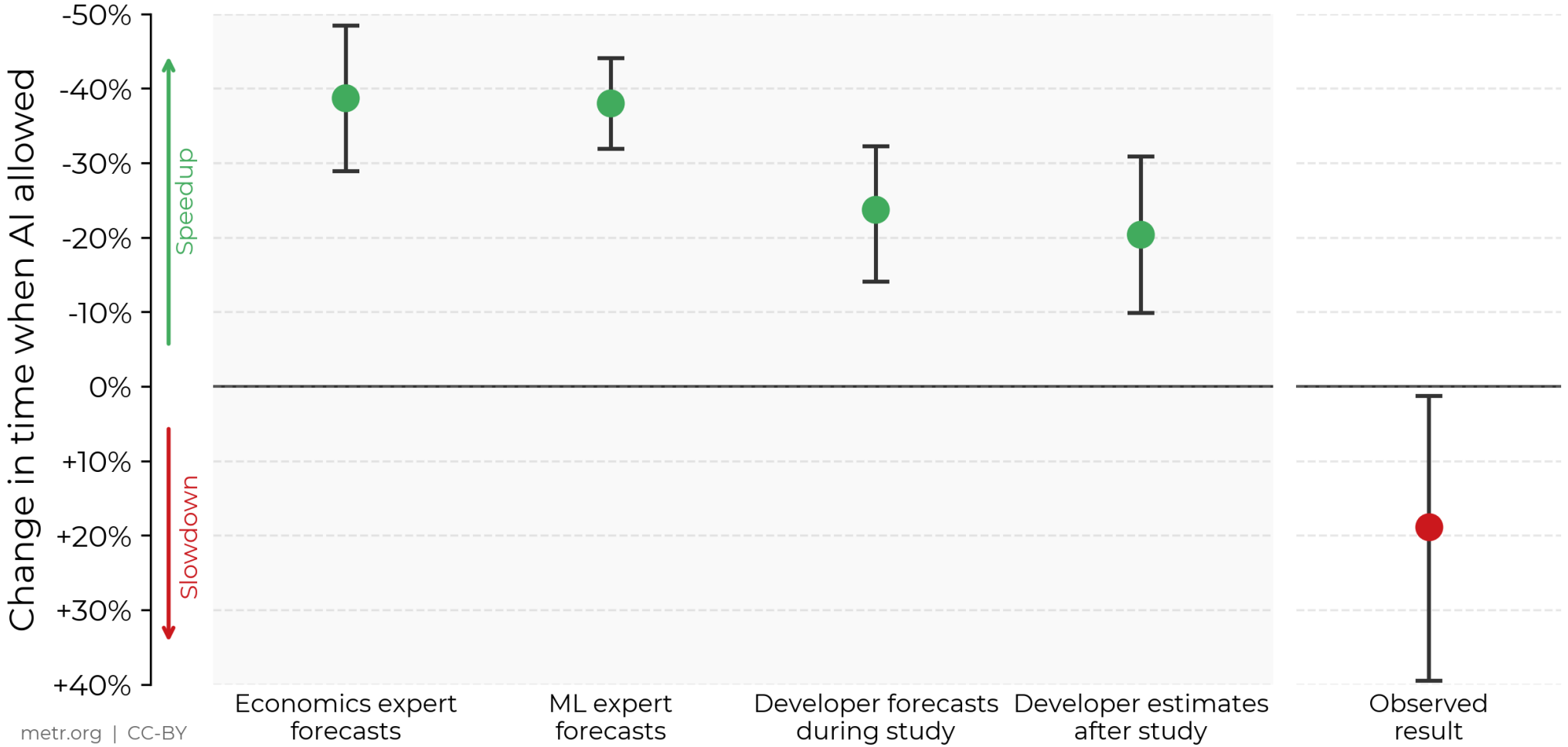
Expectations: this course

- What will we cover in this course
  - Outcomes from Syllabus
  - But basically, we will lay the foundations of your programming skills
  - While programming is not all of computer science
    - Important fundamental skill
    - Even in the Gen AI era (see next)
    - Focus of this course
  - If you have been programming for a while
    - Recognize all the outcomes- maybe you should go to comp152

Against Expert Forecasts and Developer Self-Reports, Early-2025 AI Slows Down Experienced Open-Source Developers

METR

In this RCT, 16 developers with moderate AI experience complete 246 tasks in large and complex projects on which they have an average of 5 years of prior experience.



This course: Technical

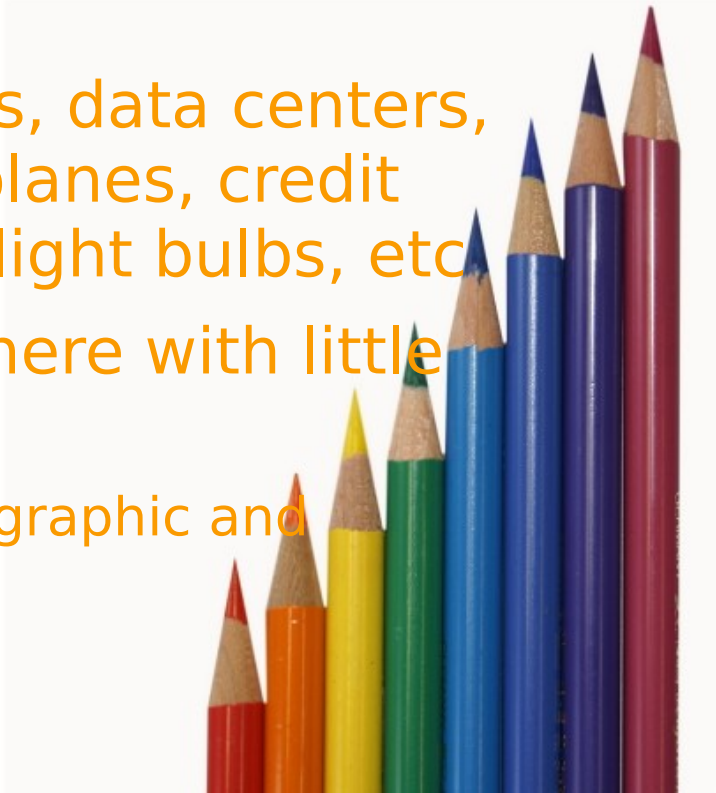
- In this course we will use python (version 3)
  - https://www.python.org/downloads/
  - (get the latest version of python3)
- Use pycharm
  - https://www.jetbrains.com/student/
  - Hit apply now button and fill out form with your BSU email
  - Download professional edition
- Available on machines in all labs
- Comp143 will help with installs this/next week

What is a computer

- So we program computers
  - What is a computer?

What is a computer

- So we program computers
  - What is a computer?
  - Possible answers
    - Smartphones, tablets, laptops, data centers, cars, thermostats, toasters, planes, credit card machines, alexa, smart light bulbs, etc.
    - One thing to notice: lots on there with little to no user interface.
      - This semester we will see both graphic and command line programs.

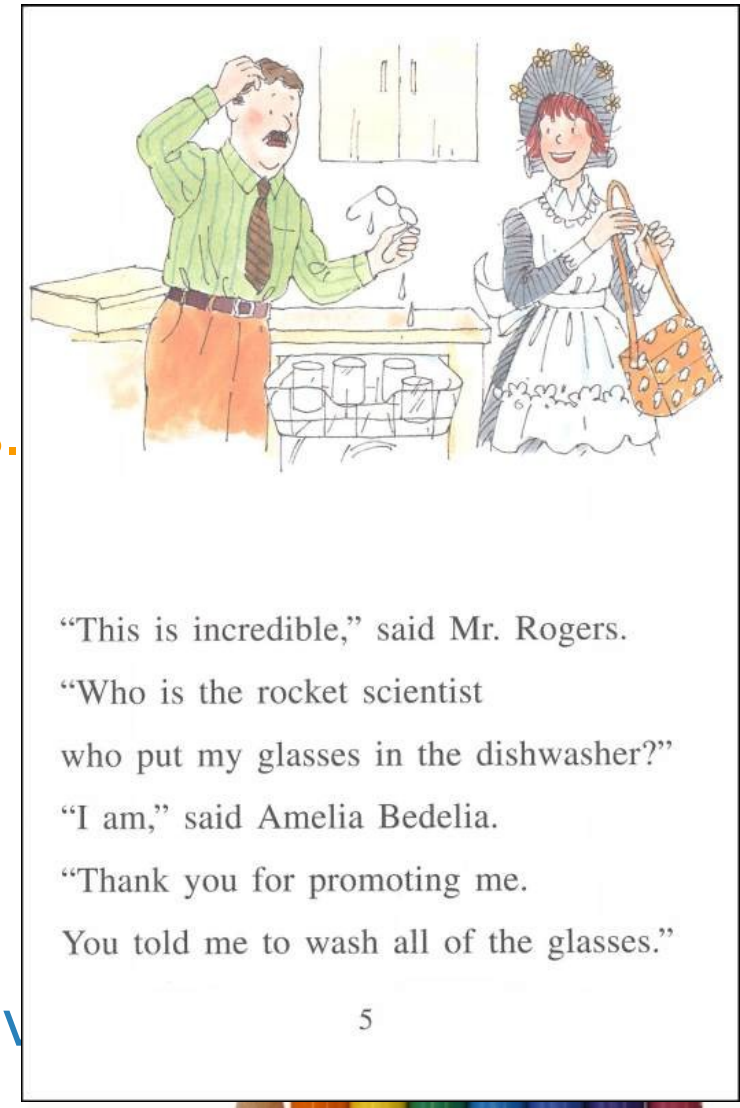


Computers

- At heart computer is a really fancy calculator
  - Moves numbers around and manipulates them
  - This number in this location means draw a red pixel on the screen there
  - In comp206 you'll get a taste of that
  - We won't more than brush by it here

Computers are Amelia Bedelia

- Computers Do exactly what you tell them to do
  - don’t handle ambiguity
  - can’t use natural language
    - Eg: “Flying planes can be dangerous.
      - Credit (Chomsky 1965)
    - We saw her duck.
  - Students tell me what these mean
  - Or the peanut butter challenge
    - https://www.youtube.com/watch?v
      I&t=197s



“This is incredible,” said Mr. Rogers.
“Who is the rocket scientist
who put my glasses in the dishwasher?”
“I am,” said Amelia Bedelia.
“Thank you for promoting me.
You told me to wash all of the glasses.”

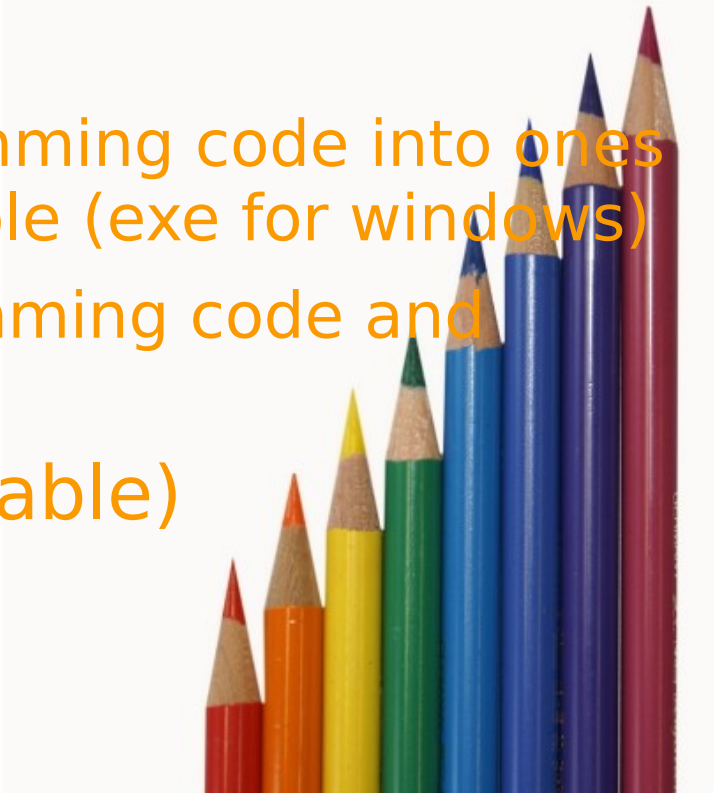
5

Programming Languages

- We design/describe software using programming languages
  - Formal, structured languages where each statement can have only one interpretation for the computer
  - Python for this course
  - Java for the next two (at least for now)
  - Others after that.
  - After you learn a couple of languages, concepts are mostly the same, just syntax that differs.

So how do we get there

- Programming language are written using characters
  - Even lots of keywords that look like English
  - So how do we get to the ones and zeros of the computer hardware?
  - Two possibilities
    - Compiler: translates your programming code into ones and zeros and makes an executable (exe for windows)
    - Interpreter: reads in your programming code and executes it as it reads the code
  - Python is interpreted. (and portable)



Super simple program

- Lets look at our very first simple program
  - Lets break out and start up pycharm
- Then my quick two question survey

Assignment

- If you will be working on a personal laptop/desktop
  - Start installing the python/pycharm tools.
    - If you don’t need the command line, then just install pycharm and let it install python.
      - If you have an old version of pycharm, update it to one of the 2025.x versions
  - Read chapter 1 in your book.
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