Introduction to Computer Programming: Software Development in the Age of AI

1e | Binary Logic and McGraw Hill

New!

Grades 9–12

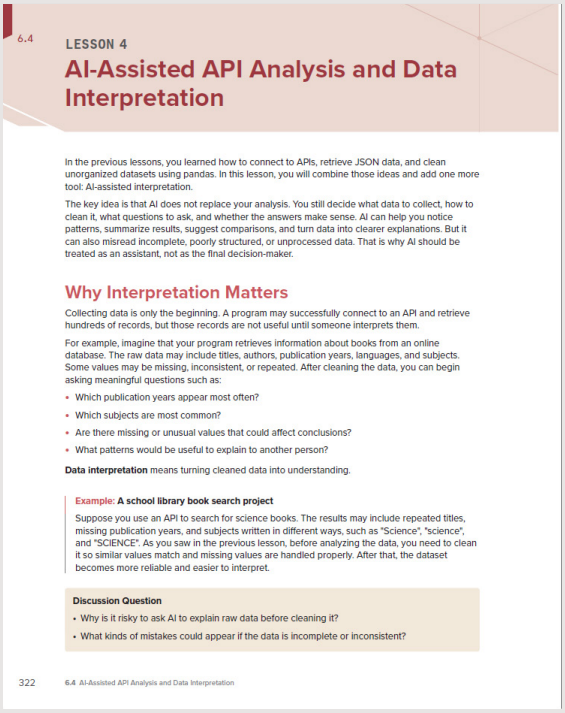
Building the Skills, Mindset, and Habits of Real Developers

Introduction to Computer Programming takes students from foundational coding concepts to building real software applications, with AI tools integrated throughout. Beginning with how software systems are designed and prototyped, and progressing through Python programming, data structures, UX/UI design, and search strategies, students develop the technical confidence and problem-solving instincts that define modern developers.

Designed for CTE pathways, the material connects classroom learning with real-world technical skills and career opportunities in software, AI, data, automation, and other fast-growing computing fields. Students learn to think like developers—planning, writing, reviewing, and iterating on code as part of a structured workflow.

Key Features

- **Skill Building:** Students write and debug Python programs, work with real data structures and APIs, apply search algorithms, and explore natural language processing, building a foundation that supports further study in computer science and CTE technology pathways.
- **Active Learning:** Every unit connects to authentic software development practices. Students plan before they code, test and iterate on their work, and complete a capstone project that brings their skills together in a real application.
- **AI as a Development Partner:** Students use AI tools to predict outputs, debug code, and improve solutions, building responsible, effective AI habits with an emphasis on thinking first and using AI to sharpen their own understanding.
- **Commitment to Pedagogy:** The course follows a structured, scaffolded approach that builds skills progressively, reinforcing concepts through practice and increasing complexity over time.



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LESSON 4

AI-Assisted API Analysis and Data Interpretation

In the previous lessons, you learned how to connect to APIs, retrieve JSON data, and clean unorganized datasets using pandas. In this lesson, you will combine those ideas and add one more tool: AI-assisted interpretation.

The key idea is that AI does not replace your analysis. You still decide what data to collect, how to clean it, what questions to ask, and whether the answers make sense. AI can help you notice patterns, summarize results, suggest comparisons, and turn data into clearer explanations. But it can also misread incomplete, poorly structured, or unprocessed data. That is why AI should be treated as an assistant, not as the final decision-maker.

Why Interpretation Matters

Collecting data is only the beginning. A program may successfully connect to an API and retrieve hundreds of records, but those records are not useful until someone interprets them.

For example, imagine that your program retrieves information about books from an online database. The raw data may include titles, authors, publication years, languages, and subjects. Some values may be missing, inconsistent, or repeated. After cleaning the data, you can begin asking meaningful questions such as:

- Which publication years appear most often?
- Which subjects are most common?
- Are there missing or unusual values that could affect conclusions?
- What patterns would be useful to explain to another person?

Data interpretation means turning cleaned data into understanding.

Example: **A school library book search project**

Suppose you use an API to search for science books. The results may include repeated titles, missing publication years, and subjects written in different ways, such as "Science", "science", and "SCIENCE". As you saw in the previous lesson, before analyzing the data, you need to clean it so similar values match and missing values are handled properly. After that, the dataset becomes more reliable and easier to interpret.

Discussion Question

- Why is it risky to ask AI to explain raw data before cleaning it?
- What kinds of mistakes could appear if the data is incomplete or inconsistent?

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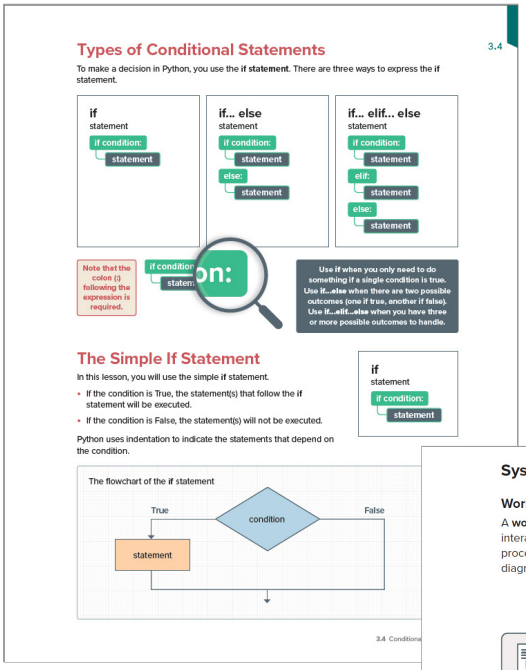

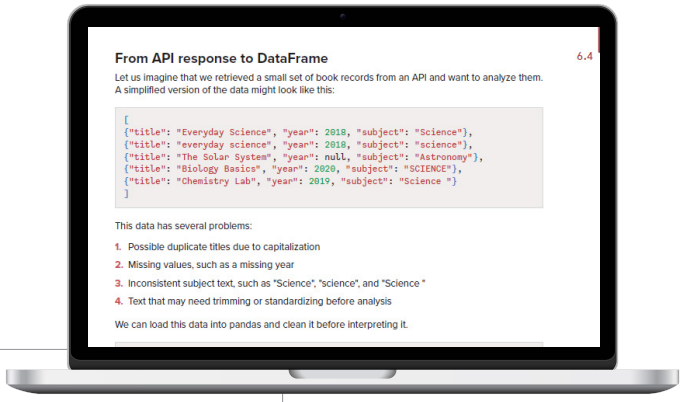

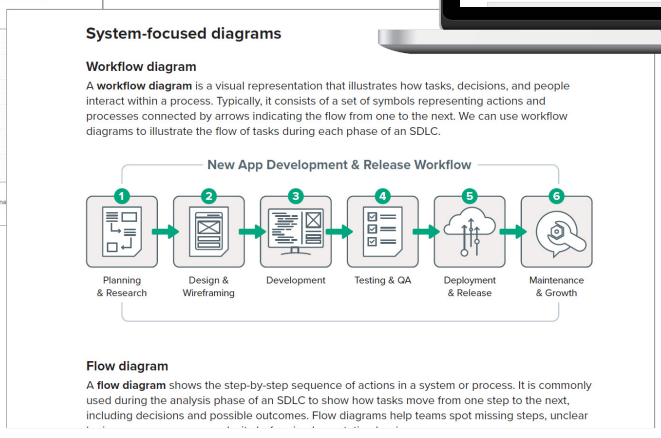

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