**Lesson 3:** Developing efficiency: Object-oriented programming, testing and debugging, working with databases

**Estimated Time**: 8 hours

**Guiding Question:** What is object-oriented in Python? How to test and debug your code and work with databases?

**Concepts:** Object-oriented programming; testing and debugging; working with databases

**Lesson Description**: Students are introduced to object-oriented programming principles in Python. Students learn two testing tools and debugging steps. The lesson introduces *sqlite3* module to connect databases in Python.

| **Materials and Resources** | **Learning Goals** |
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| 1. Lesson slides 2. Projector and computer for teacher (if in-person) | * Learn object-oriented programming concepts. * Learn testing tools and debugging principles. * Learn how to connect databases with Python. |

| **Time** | **Lesson Content** | **Instructor Notes** |
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| 9:00-10:30 | Object-Oriented Programming |  |
| 10:30-11:00  10 min break  11:10-12:10 | Testing and debugging |  |
| 12:10-13:10 | LUNCH |  |
| 13:10-16:10  10 min break | Databases |  |
|  | Self-study: Designing algorithms |  |
| 40 min | **Assessment**  Assignment 3  Test and debug the four functions created as part of the Assignment 2. | Allow 20 min for individual work.    Attend students' questions. |