How Do I Ensure That a Program Works as Intended

Validation Checks

1. Length check
2. Range check
3. Presence check
4. Format check

Errors

1. Syntax errors
    - Errors that are due to incorrect source code that does not follow the rules of the language
    - Detected when the compiler or interpreter translates the source code into machine code
    - Caused by spelling mistakes or the incorrect sequence of symbols in source code
2. Runtime errors
    - Errors that are detected while a program is running, usually causing the program to crash or hang
    - While the program is being run
    - Incorrect use of commands, input data that has not been properly validated or conditions occurring outside the program's control (such as running out of memory)

3. Logic errors
    - Errors that usually do not cause the program to crash or hang immediately; instead the program does not give the expected output.
    - While the program is being run
    - Use of an incorrect or incomplete algorithm.

Debugging Techniques

1. Using intermittent print statements
2. Walking through a program
3. Testing program in small chunks or by parts

Test Cases for Conditions

1. Normal Conditions
2. Boundary Conditions
    - Situations where the input data is at the limit of what the program is designed for, or where special handling of the input data is required.
3. Error Conditions
    - Situations where the input data would normally be rejected by the program.