Program Testing and Debugging

- Program testing involves running various tests, such as desk-checking and debugging (These two are called alpha testing) and then running actual or real data to make sure the program works.
- Steps:
    - ✓ **Perform desk checking** – this is simply reading through (proofreading) or manually testing, the solution design to make sure that it is free of errors and that the logic works
    - ✓ **Debug the Program**
        - After desk-checking, the programmer needs to compile the source code to convert it into an object code.
        - The process of converting a source code into an object code is called compilation.
        - During compilation, some errors (called bugs) may be encountered, causing the program's failure to produce the desired output.
        - The programmer needs to go through the process of detecting, locating and removing these errors.
    - ✓ Run Real Data

Types of Error

1. **Syntax** – the most common error the programmer may encounter. Caused by typographical error or failure to strictly follow the syntax.
2. **Run-time** – a software error that occurs while a program is being executed, as detected by a compiler or other supervisory program. Mostly occurs in numeric calculations.
3. **Logic** – caused by incorrect use of control structures. These errors are much more difficult to detect than syntax error because the computer cannot tell an error in logic in a program.

1. Program Documentation and Maintenance

- In this step, the programmer makes a detailed description on how the program was created.
- It contains a brief narrative process undergone by the program.
- Steps:
    - ✓ **Prepare user documentation** (printed or online manuals)
    - ✓ **Prepare operator documentation** (used for computer operators who need information on what to do when the program malfunctions.

- ✓ **Prepare program documentation** (consists of written, graphic and electronic descriptions of what a program is and how to use it)
- ✓ **Maintain the Program** (maintenance is any activity designed to keep the program error–free, up–to–date and in good working condition)