Important Terms
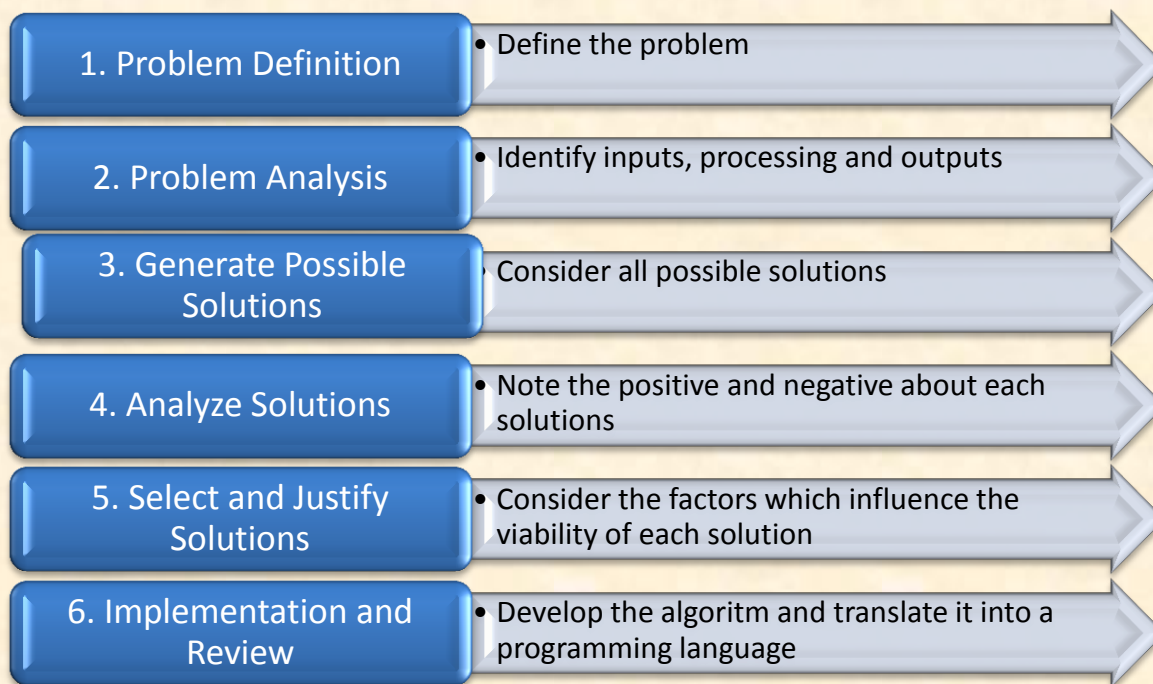
✓ **Debugging:** The process of correcting errors that occur in a problem.

✓ **Testing:** The process of checking the logic and correctness of a program.

✓ **Test Data:** Dummy data used to check the logic and correctness of a program before end-users operate it.

✓ **Live Data:** Data previously processed by the system that is used to check the logic and correctness of a program before end-users operate it.

✓ **Dry Run/Desk Check:** A manual traversal of the logic and correctness of a program.

✓ **Program Trace:** A software traversal of the logic and correctness of a program.

✓ **Break-point:** Pauses the program execution at the point of location where it is marked by programmer, e.g. line number or function name.

✓ **Watch-point:** A special breakpoint that stops your program when the value of an expression changes.

✓ **Debugging Strategies:** Trace tables and 'Watches'.

Problem Solving Process

Step	Description
1. Problem Definition	• Define the problem
2. Problem Analysis	• Identify inputs, processing and outputs
3. Generate Possible Solutions	• Consider all possible solutions
4. Analyze Solutions	• Note the positive and negative about each solutions
5. Select and Justify Solutions	• Consider the factors which influence the viability of each solution
6. Implementation and Review	• Develop the algoritm and translate it into a programming language

Types of Errors

1. **Syntax Error**: An error which breaks one of the rules of a given programming language e.g. sum=x+y.

2. **Logic Error:** An error which has the correct syntax but does not give the correct result, e.g. sum=x-y;.

3 **Run-time Error:** An error that occurs when the program is executed. For example, division by zero or referencing an array location that is outside of the legitimate bounds of the array.

4. **Semantic Error:** Semantic errors are Logical, while Syntax errors are code errors. An expression such as x + y is syntactically correct but if x is declared as char and y as float then it is semantically meaningless. A semantic error would compile, but would be incorrect logically.