

Programming Principals

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Dr Alan Woodley

TARANG JANAWALKAR

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1 Programming

Definition 1.0.1. Programming is the process of designing and building an executable computer program to accomplish a specific computing result or to perform a specific task.

Programming involves:

1. Analysis
2. Design
3. Implementation
4. Testing

1.1 Analysis

- What is the problem?
- What data is involved — input, output?
- What is the relationship between input and output?
- What other constraints?

1.2 Design

- Specify modules that need to be created to implement the solution.
- Module — group of closely related functions and data they need to do their job
- Which parts of the problem are closely related? They probably belong together in a module.
- How do modules fit together and communicate?
- How can I test each of these modules to be sure they behave as desired?
- How can I test the complete system to be sure it behaves as desired?

1.3 Implementation

2 Types and Expressions

Definition 2.0.1 (Type). The type of an expression is “what kind of data” the expression carries.

Definition 2.0.2 (Variables). Variables are a kind of expression which have an **identity** and a **value**.

The **value** of a variable may change as a program runs, however in a statically typed language, the **type** of each variable is specified before it can be used, and never changes.