Hand Tracing Encyclopedia Article

Hand Tracing

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Hand Tracing

Hand tracing is a technique that is used to verify **algorithms** in object-oriented programs such as **Java**. The technique follows the execution of programs in detail, line by line, with respect to **code**. In addition to revealing errors in the writing of a program, hand tracing can be used to understand how a Java program works.

With hand tracing, the execution of a program code is "walked through" to check its **correctness**. This process can literally involve dividing a piece of paper into categories and recording information under the appropriate headings. For example, the left side of a page can be used for **memory** cells and the right side of the page can be used for functions. Each **function** is aligned underneath the corresponding **argument** of the statement that calls for the function. A horizontal line separates different functions.

Alternatively, a program can be hand traced by the use of diagrams. Every **method** is represented by a rectangle and every **object** is represented by an oval. Each oval is labeled according to its **class** or its contents. Eavery reference is represented by a small rectangle within the larger rectangular method to which it is associated (or, to the method that declares it). Finally, every reference has an arc that connects it to the object that it references.

Hand tracing is useful in revealing normal logic errors. By keeping a running tabulation of the program variables and how they change during their use, and by comparing this pattern with the pattern in the computer, a difference may be revealed. The difference is a potential source of the logic error.