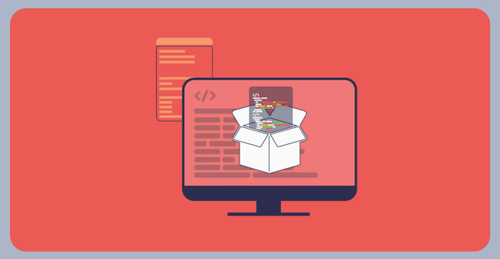
AP Computer Science Priciples

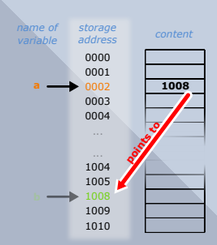
Variables

Albert Chen Nov. 24 2025

I. Variables in Computer Programs

In high-level programming, a **variable** is an abstract storage or indirection location paired with an associated symbolic name, which contains some known or unknown quantity of data or object referred to as a value; or in simpler terms, a variable is a named container for a particular set of bits or type of data (like integer, float, string, etc...) or undefined.





A variable can eventually be associated with or identified by a memory address. The variable name is the usual way to reference the stored value, in addition to referring to the variable itself, depending on the context. This separation of name and content allows the name to be used independently of the exact information it represents. The identifier in computer source code can be bound to a value during run time, and the value of the variable may thus change during the course of program execution.

II. Variables in Programming Languages

C / C++

```c
int year; // Declaration
year = 2025; // Assignment
auto month = 12; // Declaration with initial assignment
```

JavaScript / TypeScript

```javascript
let day = 5; // Declaration of a mutable variable
day = day - 1; // Reference and reassignment
// Typed immutable variable (TS only)
const series: string = 'Octopath Traveler';
```

Java / C#

```java
// Declaration with initial assignment
var ordinal = 3;
string id = "octopath-traveler-0";
double? rating = null; // Nullable type
```

Python

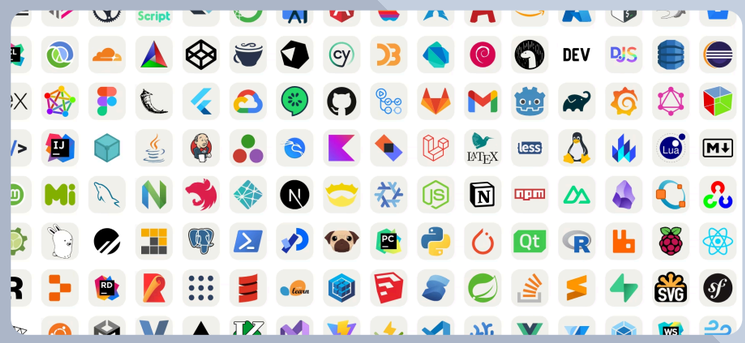
```python
name = "Octopath Traveler 0"
recommendations = ["Octopath Traveler", "Octopath Traveler II"]
isAvailable = false
```

PowerShell

```powershell
$price = 49.99;
$publisher = "Square Enix"
```

CSS

```css
// Declaration
:root {
  --primary-color: #4a90e2;
  --base-margin: 12px;
}
// Reference
button {
  background-color: var(--primary-color);
  margin: var(--base-margin);
  color: white;
}
```



III. Naming Convention of Variables

In computer programming, a naming convention is a set of rules for choosing the character sequence to be used for identifiers which denote variables, types, functions, and other entities in source code and documentation.

Reasons for using a naming convention (as opposed to allowing programmers to choose any character sequence) include the following:

- To improve readability and maintainability;
- To enable code reviews to focus on logic rather than naming standards.

The choice of naming conventions can be a controversial issue, with partisans of each holding theirs to be the best and others to be inferior. Colloquially, this is said to be a matter of dogma. Many companies have also established their own set of conventions.

Formatting	Name(s)
twowords	flatcase
TWOWORDS	UPPERCASE, SCREAMINGCASE
twoWords	(lower) camelCase, dromedaryCase
TwoWords	PascalCase, UpperCamelCase
two_words	snake_case, snail_case, pothole_case
TWO_WORDS	ALL_CAPS, SCREAMING_SNAKE_CASE, MACRO_CASE, CONSTANT_CASE
two_Words	camel_Snake_Case
Two_Words	Pascal_Snake_Case, Title_Case
two-words	kebab-case, dash-case, lisp-case, spinal-case
TWO-WORDS	TRAIN-CASE, COBOL-CASE, SCREAMING-KEBAB-CASE
Two-Words	Train-Case, HTTP-Header-Case

References

Wikipedia
Iconify - Skill Icons, Fluent UI System Icons, Simple Icons, Hugeicons
Aqua Cloud

Albert Chen, Nov. 24 2025