AP CSP Vocabulary Glossary

Working in Python · alphabetical · 144 terms · AP-tested terms only

Terms marked **AP** *appear on the College Board AP CSP exam's own vocabulary list. A superscript chapter number links to where this book defines the term.*

Vocabulary drawn from *Working in Python*, a fork of Allen Downey's *Think Python*, 3rd edition (CC BY-NC-SA 4.0), and this course's own AP CSP vocabulary reference. AP CSP definitions here are written in this course's own words, not copied from the College Board's Course and Exam Description.

A

abstraction AP Reducing complexity by exposing essential features and hiding implementation detail.

aggregation of information AP Combining separately harmless pieces of data to identify or profile a person.

algorithm AP A finite sequence of steps that solves a problem or completes a task. Can be written in English, pseudocode, or code.

algorithmic efficiency AP An estimate of the computational resources an algorithm uses as a function of input size.

analog data AP 7b Values that vary continuously and smoothly, with no steps.

anonymization AP Removing identifying details from data — and its limits, since aggregation can re-identify.

API AP The specification of how a library's procedures are called and how they behave.

argument AP 2 A value provided to a function when the function is called.

ASCII AP 7b A table assigning a number from 0 to 127 to each of a small set of characters.

assignment statement AP 2 A statement that assigns a value to a variable.

authentication AP Verifying that a user is who they claim to be.

B

bandwidth AP Maximum data transmittable per unit time, in bits per second.

beneficial and harmful effects AP Every computing innovation has both, and they can fall on different groups of people.

bias AP Systematic unfairness embedded in an algorithm or in the data it was built from.

binary AP 7b Base-2 representation, using only the digits 0 and 1.

binary search AP Repeatedly halving a sorted list to locate a value.

bit AP 7b A single binary digit, 0 or 1.

boolean expression AP 5 An expression whose value is either True or False.

byte AP 7b Eight bits. Enough to hold one of 256 values.

C

certificate authority AP An organization that issues and vouches for digital certificates.

citizen science AP Scientific research carried out partly by volunteers using their own devices.

code segment AP A portion of a program, one or more lines, treated as a unit.

collaboration AP Working with others to develop a computing innovation; benefits from varied perspectives and skills.

comment AP 2 Text included in a program that provides information about the program but has no effect on its execution.

compound conditional AP A single condition combining multiple Boolean expressions with AND, OR, or NOT.

computer network AP Interconnected computing devices able to send and receive data.

computer virus AP Malware that copies itself, typically by attaching to other programs or files.

computing device AP A physical artifact that can run a program.

computing innovation AP A product, service, or concept that includes a program as an integral part of its function. May be physical, software, or conceptual.

computing system AP A group of computing devices and programs working together.

concatenation AP 1 Joining two strings end-to-end.

conditional statement AP 5 A statement that controls the flow of execution depending on some condition. *(AP calls this selection.)*

constant AP A named value that does not change during execution.

cookies AP Small data files stored by a site to track a user's state or behavior.

copyright AP The exclusive right of a creator to reproduce, distribute, and display a work.

correlation AP An association between two variables where changes in one accompany changes in the other.

creative commons AP A set of public licenses letting a creator pre-authorize specific reuse under stated conditions.

crowdsourcing AP Gathering input, funding, or labor from many people over the Internet.

D

data AP Values that can be stored and processed by a program.

data abstraction AP Using a data structure, typically a list, to represent related values as one named unit, hiding the individual pieces.

data cleaning AP Making data uniform and consistent without changing its meaning.

data mining AP Analyzing large data sets to find patterns and relationships.

data set AP A collection of related data organized for analysis.

debugging AP 1 The process of finding and correcting errors.

decidable problem AP A yes/no problem for which an algorithm can always produce the correct answer.

decimal AP 7b Base-10, the system you already use.

digital certificate AP A credential issued by an authority binding a public key to an identity.

digital data AP 7b Values represented in discrete steps, ultimately as bits.

digital divide AP Unequal access to computing and the Internet across socioeconomic, geographic, or demographic lines.

distributed computing AP Multiple devices in different locations running parts of one program.

DNS AP Translates domain names into IP addresses.

docstring AP 4,6b A string at the beginning of a function that documents what the function does; unlike a comment, it is stored on the function and can be read by the program. *(AP calls this program documentation.)*

E

element AP 9 One of the values in a list or other sequence.

encryption AP Encoding data so only holders of the key can read it.

event AP An action supplied to a program as input: key press, click, sensor reading.

event-driven programming AP Statements execute in response to events rather than in top-to-bottom sequence.

expression AP 1 A combination of variables, values, and operators.

F

fault tolerance AP Continuing to operate when components fail.

filtering AP 10 Looping through a sequence and selecting or omitting elements. *(AP calls this data filtering.)*

function AP 1 A named sequence of statements that performs some useful operation. Functions may or may not take arguments and may or may not produce a result. *(AP calls this a procedure.)*

H

hand tracing AP 6b Working through code on paper line by line, writing down each variable's value, in order to find an error without running the program.

heuristic AP An approach that finds a good-enough solution when finding the optimal one is impractical.

hexadecimal AP 7b Base-16, using 0 through 9 and A through F. Four bits per digit, so one byte is exactly two hex digits.

HTTP / HTTPS AP The Web's request/response protocol; HTTPS adds encryption in transit.

I

incremental development AP 6 A program development plan intended to avoid debugging by adding and testing only a small amount of code at a time.

index AP 8 An integer value used to select an item in a sequence, such as a character in a string. In Python indices start from 0.

infinite loop AP A loop whose ending condition never becomes true.

information AP Meaning, patterns, or insight extracted from data.

integer AP 1 A type that represents numbers with no fractional or decimal part.

intellectual property AP Creative or technical work legally owned by its creator.

interface design AP 4 A process for designing the interface of a function, which includes the parameters it should take. *(AP calls this procedural abstraction.)*

internet AP A network of interconnected networks using standardized open protocols.

IP AP Protocol for addressing devices and routing packets between them.

IP address AP The unique identifier assigned to a device on a network.

iterative development AP Repeated cycles of build, feedback, and revision; earlier phases get revisited.

K

keylogging AP Recording keystrokes to capture passwords and confidential input.

L

linear search AP 7 A computational pattern that searches through a sequence of elements and stops when it finds what it is looking for.

list AP 9 An object that contains a sequence of values. *(on the AP exam, list indices start at 1; in Python, at 0.)*

logical operator AP 5 One of the operators that combines boolean expressions, including and, or, and not.

loop AP 3 A statement that runs one or more statements, often repeatedly. *(AP calls this iteration.)*

lossless compression AP 7b Reduces size while allowing the original to be reconstructed exactly.

lossy compression AP 7b Reduces size further, but only an approximation of the original can be recovered.

M

machine learning AP Systems that improve at a task from data rather than from explicit programming.

malware AP Software intended to damage or take control of a system.

metadata AP Data describing other data: creation date, size, author, location, format.

modularity AP Dividing a program into independent parts each responsible for one aspect.

module AP 2 A file that contains Python code, including function definitions and sometimes other statements. *(AP calls this a software library.)*

modulus operator AP 5 An operator, %, that works on integers and returns the remainder when one number is divided by another. *(AP calls this MOD.)*

multifactor authentication AP Requiring evidence from two or more categories: knowledge, possession, inherence.

N

nested conditional AP 5 A conditional statement that appears in one of the branches of another conditional statement.

O

open access AP Research or data made available free of access restrictions.

open source AP Software whose source is public and may be modified and redistributed.

open standard AP A publicly available specification that anyone may implement without permission or fee.

overflow error AP 7b An error that happens when a value is too large for the number of bits available to hold it.

P

packet AP A chunk of data carrying metadata such as its destination, sent across a network.

packet switching AP Splitting a message into packets that travel independently, possibly by different routes, and are reassembled at the destination.

pair programming AP Two programmers at one workstation: one drives, one reviews and thinks ahead.

parallel computing AP A program split into operations, some performed simultaneously.

parameter AP 3 A name used inside a function to refer to the value passed as an argument.

phishing AP Tricking a user into revealing private information by impersonating a trusted party.

PII AP Information that identifies or can be linked to a specific individual.

pixel AP The smallest addressable color element of a display or image.

plagiarism AP Presenting someone else's work as your own.

procedure AP 6b The exam's word for a named, reusable block of code, whether or not it returns a value. This book says function. In older languages the two words were distinct: a procedure returned nothing, a function returned a value.

program AP A collection of statements that performs a task when run.

program function AP 6b What a program does when it runs, described as behavior.

program input AP 6b Data a program receives while it is running.

program output AP 6b What a program produces: displayed text, a returned value, a file, a sound, a movement.

program purpose AP 6b The need a program serves, or the problem it solves; why it exists.

protocol AP An agreed set of rules governing system behavior.

pseudorandom AP 12 A pseudorandom sequence of numbers appears to be random, but is generated by a deterministic program. *(AP calls this RANDOM(a, b) — inclusive on both ends, unlike Python's range.)*

public key encryption AP A public key encrypts; a different private key decrypts.

R

reasonable time AP Run time that grows polynomially or slower with input size.

redundancy AP Duplicate paths or components that allow operation to continue after a failure.

relational operator AP 5 One of the operators that compares its operands: ==, !=, >, <, >=, and <=.

return value AP 6 The result of a function. If a function call is used as an expression, the return value is the value of the expression. *(AP calls this the RETURN statement.)*

RGB AP 7b Color stored as three numbers, the amounts of red, green, and blue, each usually one byte.

rogue access point AP An unauthorized wireless access point used to intercept network traffic.

roundoff error AP 6b,7b A loss of precision that happens because a fixed number of bits cannot represent some numbers exactly.

router [AP] A device that forwards packets between networks toward their destination.

routing [AP] Determining a path from sender to receiver across a network.

runtime error [AP] [2] An error that causes a program to display an error message and exit.

S

sampling [AP] [7b] Approximating an analog signal by measuring it at regular intervals. Two independent settings: how often you measure (rate) and how precisely you record each measurement (bit depth).

scalability [AP] A system's ability to keep working acceptably as demand grows.

semantic error [AP] [2,6b] An error that lets the program run but produces a wrong result. *(AP calls this a logic error.)*

sequencing [AP] Executing steps in the order written.

sequential computing [AP] Operations performed one at a time, in order.

simulation [AP] An abstraction of a real phenomenon using varying values to represent changing states, run for a purpose.

speedup [AP] Sequential time divided by parallel time.

string [AP] [1] A type that represents sequences of characters.

substring [AP] A contiguous portion of a string.

symmetric key encryption [AP] One shared key both encrypts and decrypts.

syntax error [AP] [1] An error in a program that makes it impossible to parse — and therefore impossible to run.

T

TCP [AP] Transport protocol providing reliable, ordered delivery with retransmission.

test case [AP] [6b] A specific input paired with its expected output. Good sets include typical, boundary, and edge values.

testing [AP] [6b] Checking that a program behaves correctly by running it on chosen inputs and comparing what comes out against what should have come out.

traversal [AP] Iterating over the items of a list. Full traversal visits every element; partial stops early.

type [AP] [1] A category of values. The types we have seen so far are integers (type int), floating-point numbers (type float), and strings (type str). *(AP calls this data type.)*

U

UDP [AP] Lightweight transport protocol with minimal error checking; faster, less reliable.

undecidable problem [AP] A problem for which no algorithm can always give a correct yes/no answer for every input.

Unicode [AP] [7b] A far larger table, covering the writing systems ASCII left out.

unreasonable time [AP] Run time that grows exponentially or factorially with input size.

V

variable [AP] [2] A name that refers to a value.

W

world wide web [AP] A system of linked pages and files that runs on top of the Internet using HTTP.