



Programming Language: Chapter 6

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Data type	defines a collection of data values and a set of predefined operations on those values.
Modifiability	a programmer can change the type of a category of variables in a program by changing a type definition statement only
arrays and records	two most common structured data types in the imperative languages
Descriptor	is the collection of the attributes of a variable
object	represents an instance of a user-defined (abstract data) type
Primitive Data Types	Data types that are not defined in terms of other types
integer	the most common primitive numeric datatype Java: byte, short, int, long C++ & C# : unsigned int
twos complement	to store negative integers, which is convenient for addition and subtraction.
Floating point	data types model real numbers, but the representations are only approximations for many real values.
float and double	two floating types

Precision	accuracy of the fractional part of a value, measured as the number of bits
Range	is a combination of the range of fractions and more important the range of exponents
Complex values	are represented as ordered pairs of floating point values
Decimal	data types that store a fixed number of decimal digits which are coded in Binary Coded Decimal (BCD) - essential to COBOL because of business
Boolean Types	are often used to represent switches or flags in programs.
Character Data	stored in computers as numeric codings
Unicode	includes the characters from most of the world's natural languages
ASCII	most commonly used coding
Character String Type	one in which the values consist of sequences of characters
Character String constants	used to label output, and the input and output of all kinds of data are often done in terms of strings.
Most common string operations	comparison, pattern matching, assignment, catenation, substring reference
substring reference	is a reference to a substring of a given string
regular expressions	the pattern-matching expressions are somewhat loosely based on mathematical regular expressions.
static length string	the length can be static and set when the string is created
limited dynamic length string	allow strings to have varying length up to a declared and fixed maximum set by the variable's definition
dynamic length string	allow strings to have varying length with no maximum
Enumeration Type	is one in which all of the possible values, which are named constants, are provided, or enumerated, in the definition.
Enumeration Constans	types provide a way of defining and grouping collections of named constants.

Array	is a homogeneous aggregate of data elements in which an individual element is identified by its position in the aggregate, relative to the first element
Subscripts or indices	Specific elements of an array are referenced by means of a two-level syntactic mechanism, where the first part is the aggregate name, and the second part is a possibly dynamic selector consisting of one or more items known as
finite mappings	arrays are sometimes called
static arrays	one in which the subscript ranges are statically bound and storage allocation is static (done before run time)
fixed stack-dynamic arrays	one in which the subscript ranges are statically bound, but the allocation is done at declaration elaboration time during execution.
fixed heap-dynamic arrays	similar to fixed stack-dynamic array, in that the subscript ranges and the storage binding are both fixed after storage is allocated.
heap-dynamic arrays	one in which the binding of subscript ranges and storage allocation is dynamic and can change any number of times during the array's lifetime.
array operations	one that operates on an array as a unit
heterogeneous array	one in which the elements need not to be of the same type
rectangular array	a multidimensioned array in which all of the rows have the same number of elements and all of the columns have the same number of elements
jagged array	in which the lengths of the rows need not be the same. For example, a jagged matrix may consist of three rows, one with 5 elements, one with 7 elements, and one with 12 elements.
slice	an array is some substructure of that array
row major order and column major order	two ways in which multidimensional arrays can be mapped to one dimension
associate arrays	an unordered collection of data elements that are indexed by an equal number of values called keys
hashes	in perl associative arrays are called

dictionaries	in python associative arrays are called
record	aggregate of data elements in which the individual elements are identified by names and accessed through offsets from the beginning of the structure.
fully qualified reference	record field is one in which all intermediate record names, from the largest enclosing record to the specific field, are named in the reference. In the COBOL example above the field reference is fully qualified
elliptical reference	the field is named, but any or all of the enclosing record names can be omitted, as long as the resulting reference is unambiguous in the referencing environment
tuple	is a data type that is similar to a record, except that the elements are not named.