

Programming Language Concepts

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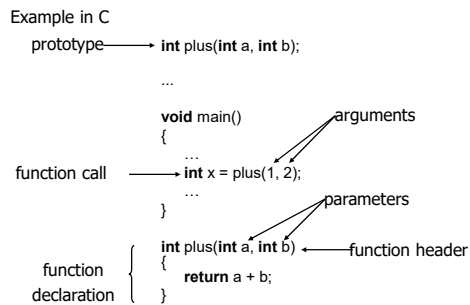
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Functions and Procedures

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Terminology



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Parameters vs. Arguments

Parameters (AKA formal parameters, formal arguments): names in the declaration of a function header

Arguments (AKA actual parameters, actual arguments): variables/expressions passed to a function during a function call

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Parameter-Argument Matching

- Usually by number and by position
 - Suppose `f` has two parameters, then any call to `f` must have two arguments, and they must match the corresponding parameters' types.
- Exceptions
 - Python/Ada/OCaml/C++
 - arguments can have default values
 - Python example:


```

>>> def myfun(b, c=3, d="hello"):
    return b + c
>>> myfun(5,3,"hello")
>>> myfun(5,3)
>>> myfun(5)
              
```

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Parameter-Argument Matching

- Exceptions:
 - Arguments and parameters can be linked by name
 - Python example:


```

>>> def myfun(a, b, c):
    return a-b
>>> myfun(2, 1, 43)
1
>>> myfun(c=43, b=1, a=2)
1
>>> myfun(2, c=43, b=1)
1
          
```

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Parameter Passing

- How values are passed between arguments and parameters?
- Different parameter passing mechanisms
 - Call by value (CBV, AKA pass by value)
 - Call by result (CBR)
 - Call by value-result (CBVR)
 - Call by reference (CBR)
 - Call by name (CBN)

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