

Type casting

- Used to convert between fundamental (simple) data types (e.g., int, double, char)
- There are two ways to do this
- The C way (technically obsolete):

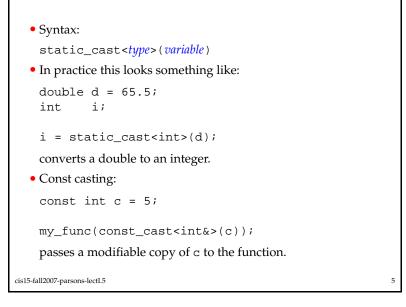
```
double d = 65.0;
int i = (double)d;
char c = (char)i;
```

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• The C++ way:

- static_cast: for conversions that are "well-defined, portable, intertable"; e.g., like the C ways, above.
- reinterpret_cast: for conversions that are system-dependent (not recommended).
- const_cast: to create a modifiable copy of a const variable; data type into which the value is cast must always be a pointer or reference (see on).
- dynamic_cast: for converting between classes (to be discussed later in the term)

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```
You create an enum data type if you want to use the names instead of the values, so you shouldn't really care what the values are internally.
If you need to set the value explicitly, you can:
```

```
enum answer { yes, no, maybe = -1 );
```

```
• If you do this you have to be careful about duplicated values (see enum.cpp).
```

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• syntax:
```

enum tag { value0, value1, ... valueN };

- The tag is optional.
- You can also declare variables of the enumerated type by adding the variable name after the closing }

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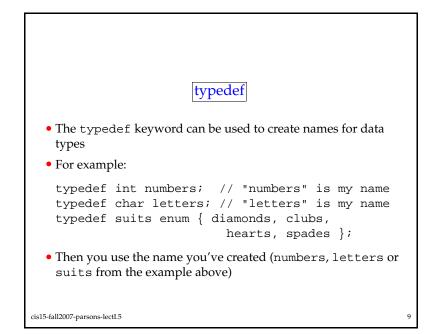
Enumeration types

- Used to declare names for a set of related items
- For example: enum suit { diamonds, clubs, hearts, spades };
- Internally, each name is assigned an int value.
- The value assigned to the first name is zero.
- The value of each member of the list is then one more than its lefthand neighbor.
- So in the above example, diamonds is actually 0, clubs is 1, and so on.

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```
void showSuit( int card ) {
   enum suits { diamonds, clubs, hearts, spades } suit;
   suit = static_cast<suits>( card / 13 );
   switch( suit ) {
      case diamonds: cout << "diamonds"; break;</pre>
      case clubs:
                       cout << "clubs";</pre>
                                              break;
      case hearts:
                      cout << "hearts";</pre>
                                             break;
      case spades:
                      cout << "spades";</pre>
                                             break;
    cout << endl;
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```



Precedence and associativity table

(listed in order of precedence)

operator	associativity
:: (global scope), :: (class scope)	left to right
[], ->, ++ (postfix), (postfix), dynamic_cast <type> (etc)</type>	left to right
++ (prefix); (postfix), !, sizeof(), + (unary), - (unary), * (indirection)	right to left
*, /, %	left to right
+, -	left to right
<<,>>>	left to right
<, <=, >>=	left to right
==,!=	left to right
&	left to right
Λ	left to right
	left to right
&&	left to right
	left to right
?:	left to right
$=, + =, - =, * =, / =, \% =, >>=, <<=, \& =, \land =, =$	left to right
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Precedence and associativity

- "Precedence" means the order in which multiple operators are evaluated
- "Associativity" means which value an operator *associates* with, which is particularly good to know if you have multiple operators adjacent to a single variable
- Associativity is either:
 - left to right, e.g., 3 2 (subtract 2 from 3)
 - right to left, e.g., -3 (meaning negative 3)
- Note that ++ and -- can be either:
 - *postfix* operators are left to right (meaning that you evaluate the expression on the left first and then apply the operator)
 - *prefix* operators are right to left (meaning that you apply the operator first and then evaluate the expression on the right)

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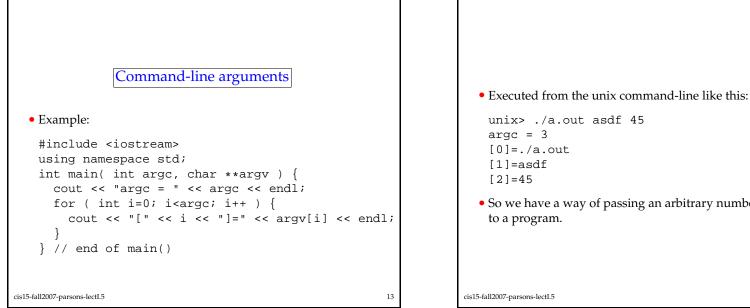
Control flow

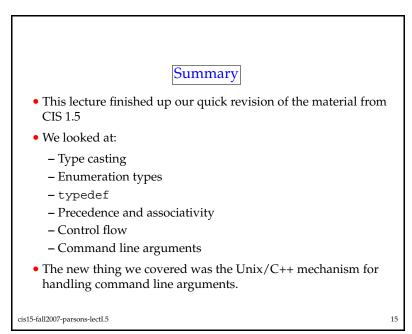
- Branching: if, if-else, switch
- Looping: for, while, do...while
- Interruption: break, continue

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• So we have a way of passing an arbitrary number of arguments

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