

Lecture Set #11: Ternary Operator and Switch

1. Method Overloading Warning
2. ternary operator: The ?:
(conditional operator)
3. switch



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Method Overloading

- prototype:
`public static void f(int x, float y)`
- signature:
`f(int , float )`
- You can only overload methods if they have different signatures.
- Implicit widening conversions
 - Beware of subtle problems with widening conversions

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The Conditional Operator

- The only ternary operator (has 3 operands)
- Format:
 - `boolean-expression?expression1:expression2`
- Purpose:
 - test to see if boolean-expression is true or false
 - whole expression takes on the value of expression1 when boolean-expression was true
 - whole expression takes on the value of expression2 when boolean-expression was false
- See examples

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What is another way to write this if-else-if statement?



```
if (grade == 'A')
    System.out.println ("I'm very happy");
else if (grade == 'B')
    System.out.println ("I'm relatively happy");
else if (grade == 'C')
    System.out.println ("At least I get credit");
else
    System.out.println ("Check with the professor");
```

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The switch Statement: General Form



```
switch (control-expression) {
case case-label-1 :
    statement-sequence-1
    break;
case case-label-2 :
    statement-sequence-2
    break;
...
case case-label-n :
    statement-sequence-n
    break;
default :
    default-statement-sequence
    break;
}
```

The control-expression is one of the following types: char, int, short, byte

Our text says it cannot be a byte or short. This is wrong!

Each case label must be a value in type of control expression

You may have any number of statements, including if-else and loops

The "break" statement jumps out of the switch statement

The optional "default" case is executed if no other case matches

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The default Case



- default is optional
If omitted, and no case matches, then the switch statement does nothing
- However, you should **always** include a default case, even if you want nothing to be done if no case matches (you should never rely on implicit behavior!)
- Although cases are not required to be in order ... (following is legal):

```
switch ( option ) {
    case 2:
        ...
    case 9:
        ...
    default:
        ...
    case 1:
        ...
}
```
- ... it is much better to list cases:
 - in increasing order
 - with default last

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Case Continuation



- The **control expression** can have one of the following types: `char`, `int`, `short`, `byte`
 - not `float`, `double`, `boolean`, `long`
 - not a `String` or other object
- Case continuation also called "cascading case behavior", "falling through to the next case", etc.
- It is occasionally handy for combining of cases
e.g. case-insensitivity

```
switch (grade) {
case 'a':
case 'A':
    System.out.println ("I'm very happy");
    break;
...
}
```
- **Be very careful** about using this cascading behavior!
 - Always insert `break` statements after every case
 - Then remove ones you do not want

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Why Use switch?



- `switch` can also be implemented using `if-else`
- `switch` also restricted in terms of data types in control statements
- Including `break` statements is a pain
- However
 - `switch` often more efficient (compiler generates better code)
 - Code can be more compact because of case-continuation behavior
 - Sometimes case analysis is clearer using `switch`

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