Lecture Set #11: Ternary Operator and Switch

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

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

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

```java
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");
```

The switch Statement: General Form

```java
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

- 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

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):
  ```java
  switch (option) {
      case 2:
      case 3:
      default:
      case 1:
  }
  ```
- ...it is much better to list cases:
  - in increasing order
  - with default last

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

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

Although cases are not required to be in order... (following is legal):
  ```java
  switch (option) {
      case 2:
      case 3:
      default:
      case 1:
  }
  ```
- ...it is much better to list cases:
  - in increasing order
  - with default last
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
  ```java
  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

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