Previous Lecture:
- Parts of a Java program
- Java types, arithmetic operations
- Variable, declaration and assignment

Today’s Lecture:
- Conditional statement
- boolean expressions

Assigned reading:
- T  Sec 2.3.3
- PL  Lesson page 1-4

Example 1
Given temperature \( t \) in Fahrenheit, write a program fragment that prints “cold” if the temperature is below 32 F.

// print message if it is cold

Example 2
Given temperature \( t \) in Fahrenheit, write a program fragment that prints “comfy” if the temperature is between 50 and 70F.

Example 3
Given temperature \( t \) in Fahrenheit, write a program fragment that prints “cold” if the temperature is below 32 F. Otherwise, print “not cold.”

// print message if it is “comfy”
// print message indicating
// whether it is cold
if ( t < 32 ) {
    System.out.println("cold");
} else {
    System.out.println("not cold");
}

### Conditional Statement

```java
if ( condition1 )
    statement1;
else
    statement2;
```

- At most one statement is executed
- At most one else clause

### Boolean

- Represent conditions or states `true` or `false`
- Only two valid values for boolean type: `true`, `false`

```java
boolean done = false;
```

### Boolean Expressions

- A condition often uses *relational operators*, which return *boolean* results:
  ```java
  ==  equal to
  !=  not equal to
  <   less than
  >   greater than
  <=  less than or equal to
  >=  greater than or equal to
  ```

- A condition often uses *logical operators*, which return *boolean* results:
  ```java
  &&  and
  ||  or
  !   not
  ```
Example 4
Variable \( m \) stores an integer value in the range \((1..12)\). Write a program fragment to print the number of days in month \( m \). Assume a non-leap year.

```java
int days; // # of days in month m

System.out.println("Month " + m + " has " + days + " days.");
```

Good programming style
Indent substructure:

```java
if ( x == y ) {
    // do something
    // ...
}
```

Good programming technique
- Develop an algorithm!
- Decompose the problem
- Refine the algorithm iteratively

Conditional Statement

```java
if ( condition1 )
    statement1;
else
    if ( condition2 )
        statement2;
    else
        statement3;
```
### Conditional Statement

```java
int days; // # of days in month m
if (m==2)
    days = 28;
else if (m%2==1 && m<=7 ||
        m%2==0 && m>=8)
    days = 31;
else
    days = 30;
}
System.out.println("Month " + m +
    " has " + days + " days.");
```