



Decision making with **if**

Fall 2022

University of Mount Union

Selection

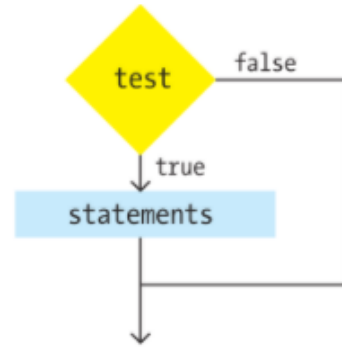
- ◆ A fundamental concept in programming
- ◆ We can perform a test and take different actions based on the result of the test
- ◆ We can do this using an `if` statement

The `if` statement in Processing

- ◆ Purpose: ask a yes/no or true/false question and specify different actions to be taken based on the result of this test

Simplest form

```
if (test) {  
    statements  
}
```



Meaning:

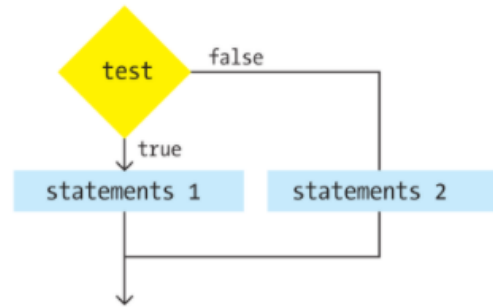
- Evaluate the test
- If the test is true, execute the statements between the curly braces

Example:

```
print(num);  
print(" is ");  
if (num <= 0) {  
    print("not ");  
}  
print("positive");
```


if statement followed by else

```
if (test) {  
    statements 1  
} else {  
    statements 2  
}
```



Meaning:

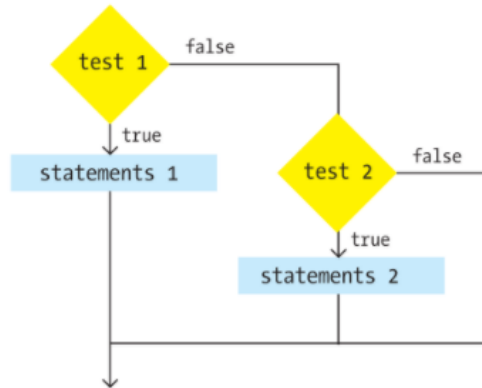
- If test is true, do first block of code
 - Skip **else** part
- If test is false, do second block of code
 - Skip **if** part

Example:

```
print(num);  
print(" is ");  
If (num > 0) {  
    print("positive");  
}  
else {  
    print("not positive");  
}
```

More than 2 choices: else if

```
if (test 1) {  
    statements 1  
} else if (test 2) {  
    statements 2  
}
```



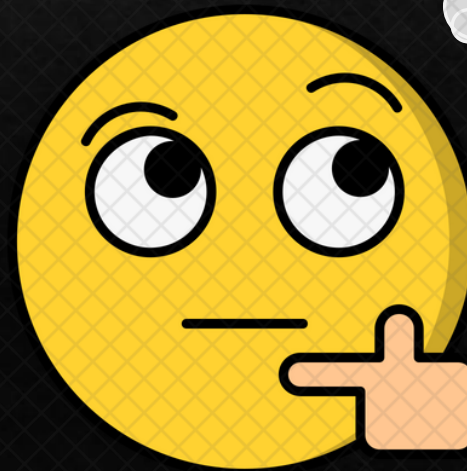
Example:

```
print(num)  
print(" is ");  
if (num > 0) {  
    print("positive");  
}  
else if (num < 0 ) {  
    print("negative");  
}  
else {  
    print ("zero");  
}
```

Types of tests

- ◆ Comparisons – 6 operators:
 - ◆ Greater than >
 - ◆ Less than <
 - ◆ Greater than or equal to >=
 - ◆ Less than or equal to <=
 - ◆ Not equal to !=
 - ◆ Equal to ==

Why a double equal (==)? Remember that ONE equal sign is used to assign a value to a variable, so for a test of equality, we use two equal signs.



Example

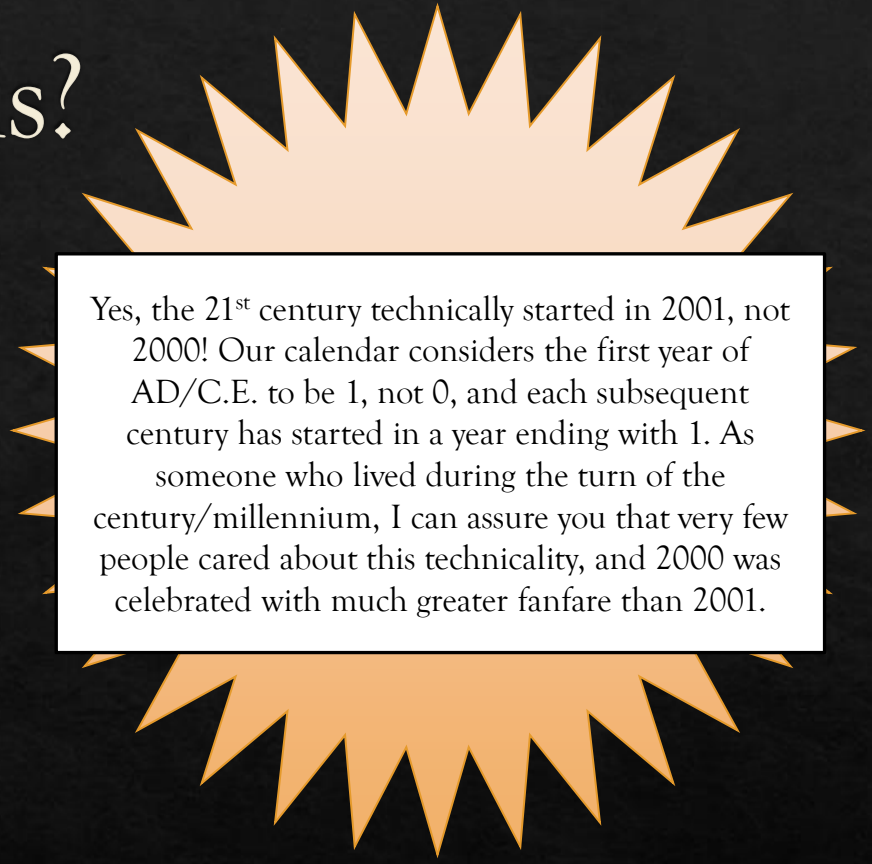
- ◆ Write a Processing code block that prints the proper message indicating whether the value of an `int` variable named `year` is in the 21st century or came before the 21st century.
- ◆ Different messages should be printed based on the value of the variable `year` – use an `if` statement to perform a test, and print different messages based on the results of the test.

What do you think?

```
print(year);  
    if (_____) {  
        print(" is in the 21st Century");  
    }  
    else {  
        print(" came before the 21st century");  
    }
```

How about this?

```
print(year);  
    if (year > 2000) {  
        print(" is in the 21st Century");  
    }  
    else {  
        print(" came before the 21st century");  
    }
```



Yes, the 21st century technically started in 2001, not 2000! Our calendar considers the first year of AD/C.E. to be 1, not 0, and each subsequent century has started in a year ending with 1. As someone who lived during the turn of the century/millennium, I can assure you that very few people cared about this technicality, and 2000 was celebrated with much greater fanfare than 2001.