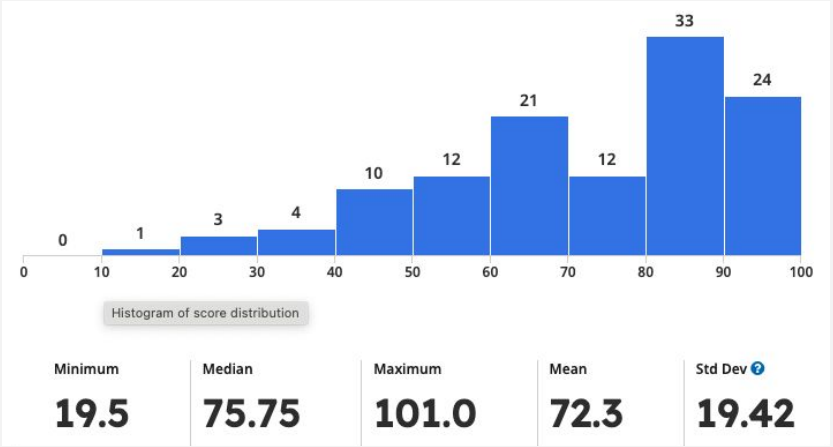
Today

- Ask me questions about PA4
- Ask me questions about the Supplementary Reading 1
  - Conditionals
- Midterm grade will be published after class



Question 1

Write the plain English algorithm for a program that draws a ball bouncing against the walls of the canvas.

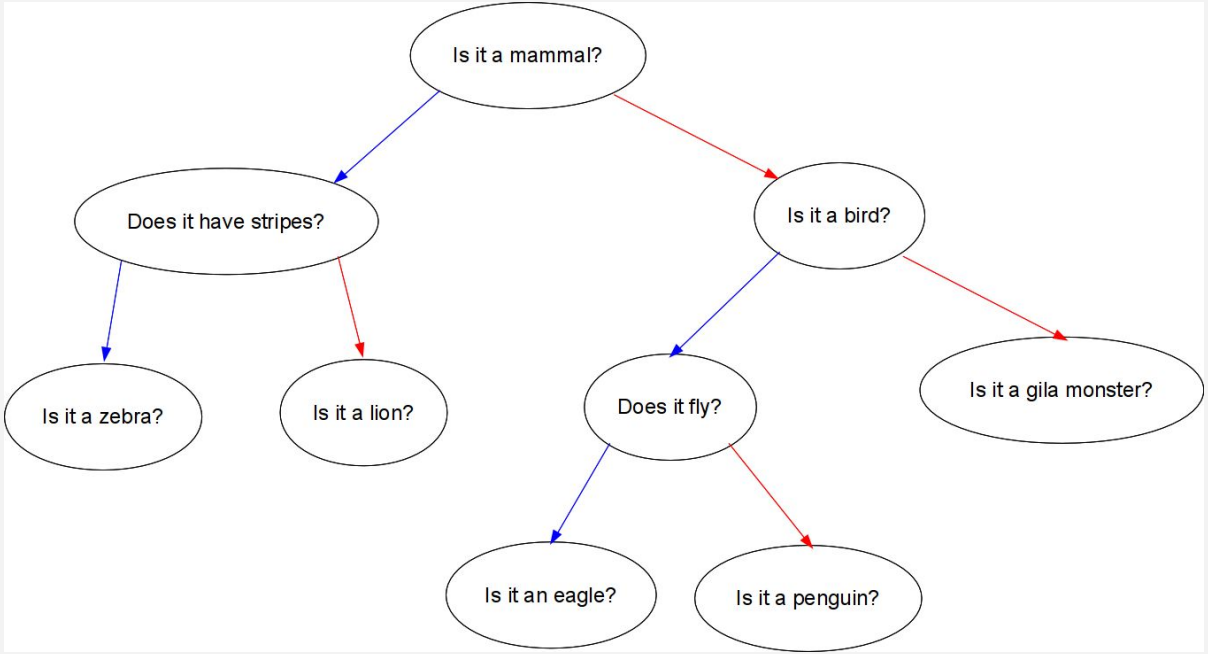
Submit your answer to Gradescope

https://www.webfx.com/archive/blog/images/assets/demos.sixrevisions.com/2010/09/11/demo.html

CS 101
Conditionals - If statements

Example 1 - 20 questions game! - Animal version

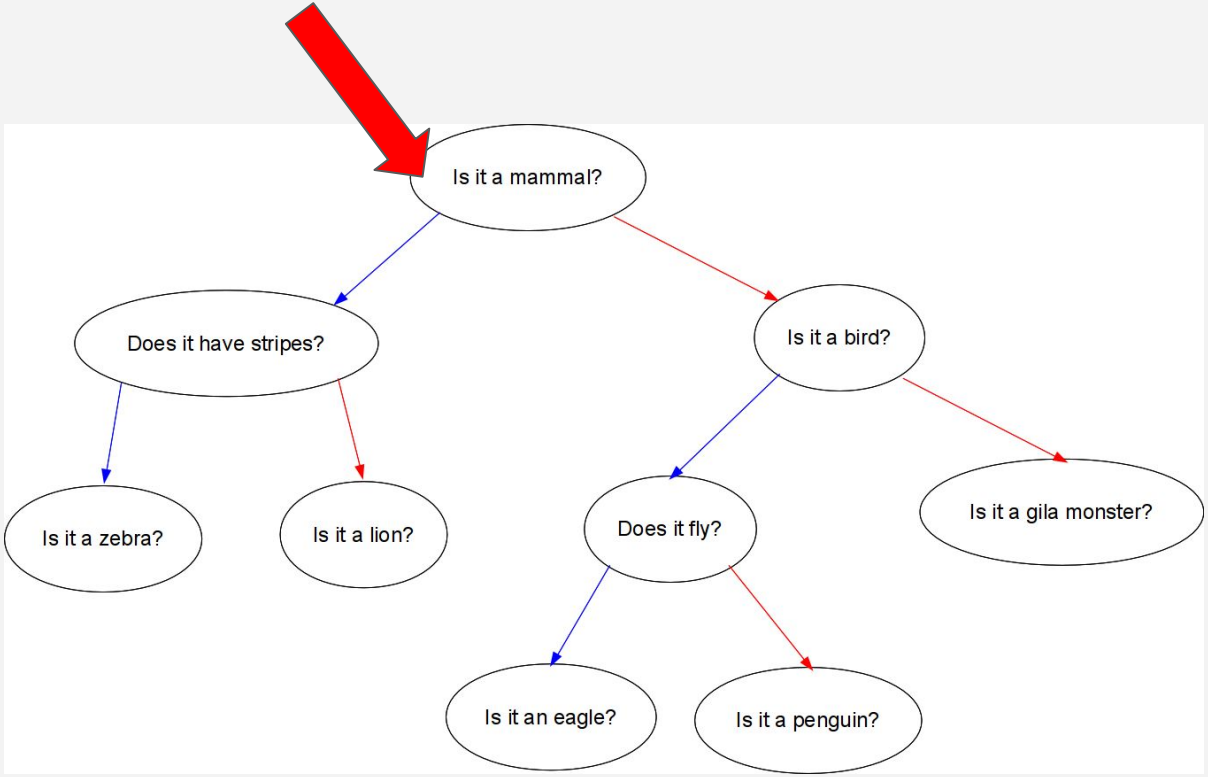
Let's say this is an algorithm to play the game



https://cs-courses.mines.edu/csci262/spring2019/projects/5-animal/animal.html

Conditions or Conditional statements

Let's say this is an algorithm to play the game



https://cs-courses.mines.edu/csci262/spring2019/projects/5-animal/animal.html

if statements

- We would like to express the flow of control just as we would in English, i.e.,

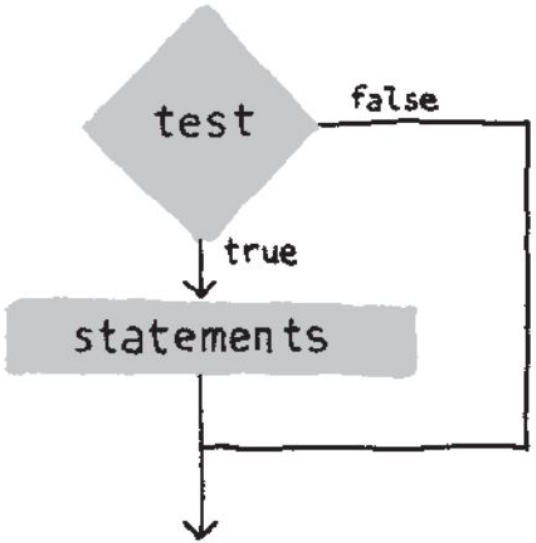
  if ***it is raining***, then

  bring an umbrella
- Notice that the condition ***it is raining*** is either true or false
- We would like to say,

  if ***the mouse is pressed***, then

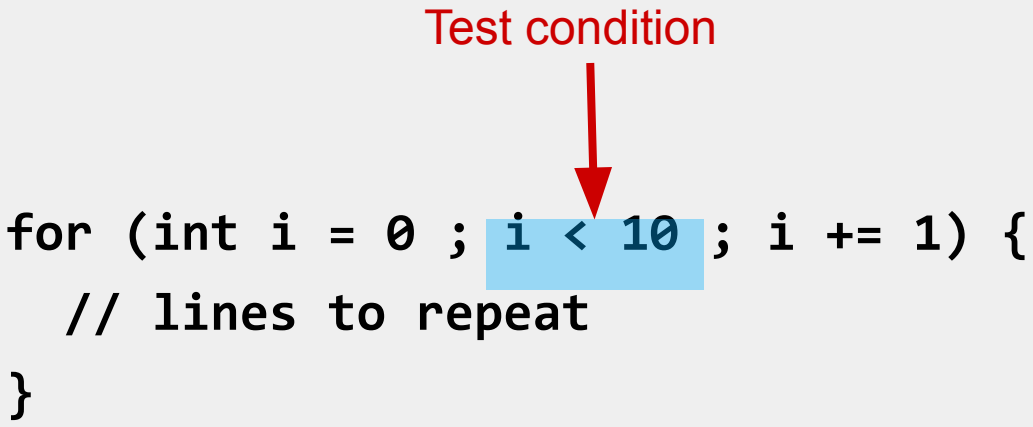
  execute this code
- Notice that the condition ***the mouse is pressed*** is either true or false

The “Flow” of an if-statement




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

Remember the *test condition* in the for-loop?



Remember the *test* in the for-loop?

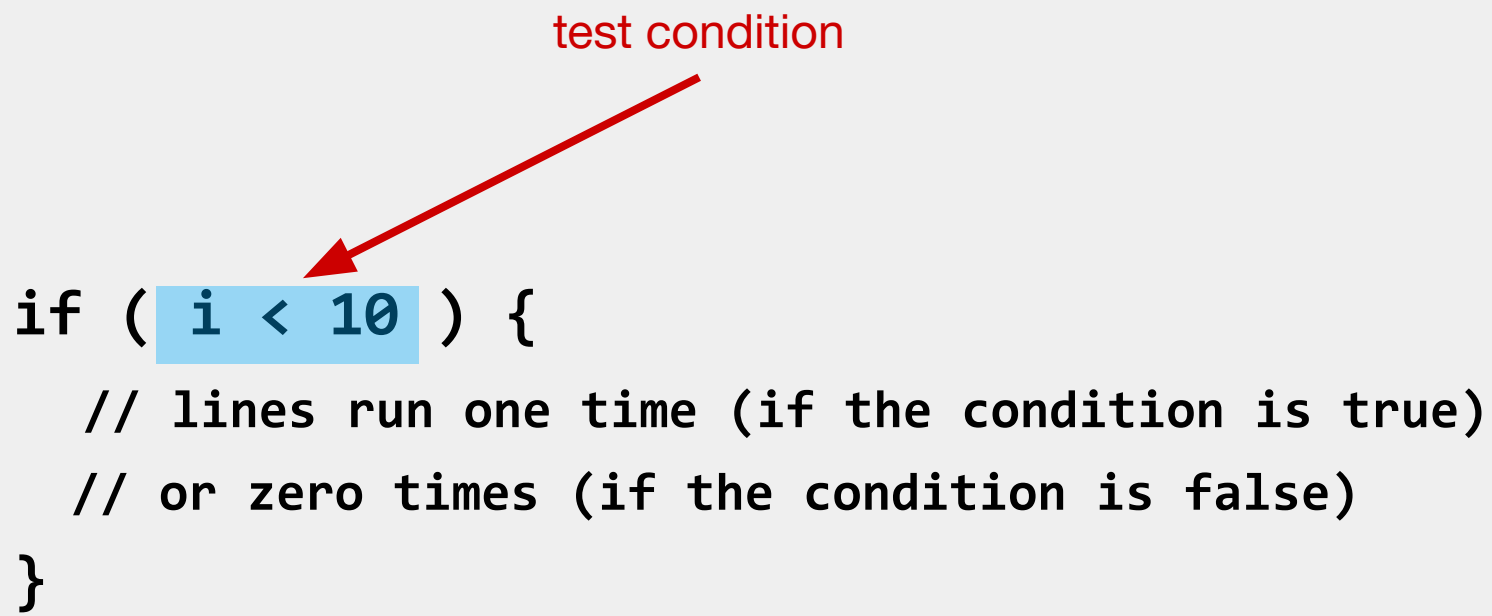
- You can also use many types of comparisons
  - `>` greater-than
  - `<` less-than
  - `>=` greater-than or equal-to
  - `<=` less-than or equal-to
  - `==` exactly equal-to
  - `!=` not equal-to

If statement Template

```
if (                    ) {


}
```

Anything written between curly brackets will be **executed only if the condition is true**


test condition
if (i < 10) {
// lines run one time (if the condition is true)
// or zero times (if the condition is false)
}

Example

```
int i = 3; //change this value to 8 to test
if ( i < 5) {
  println("the value in i is less than 5");
}
```

Nested code - we can nest ifs, fors, etc..

```
if (                    ) {
   if (                    ) {
      if (                    ) {
      }

   }
   if (                    ) {
   }
}
```

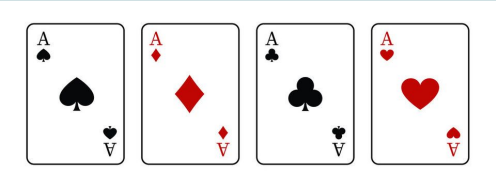
If statement Template

```
if (                    ) {

}
```

Anything written between curly brackets will be **executed only if the condition is true**

Question 2.



ICA

The steps below show each team taking turns to play the Conditionals Game. See if you can figure out what happens for each draw. Write down on Gradescope the score during each round along the way. After three rounds, who is the winner?

```
If (CARD is lower than 5)
        If ( CARD is BLACK)
                Award YOUR team the same
                number of points on the card.

        Else
                Award OTHER team 1 point.

Else
        If ( CARD is HEARTS)
                Award YOUR team 1 point
```

Here's how the game went:

	TEAM #1	END OF ROUND SCORE	TEAM #2	END OF ROUND SCORE
		0		0
ROUND #1	3♠	___	7♥	___
ROUND #2	4♥	___	4♣	___
ROUND #3	9♣	___	5♦	___

https://code.org/curriculum/course2/12/Assessment12-Conditionals.pdf

if-else statement Template

```
if (                    ) {
```

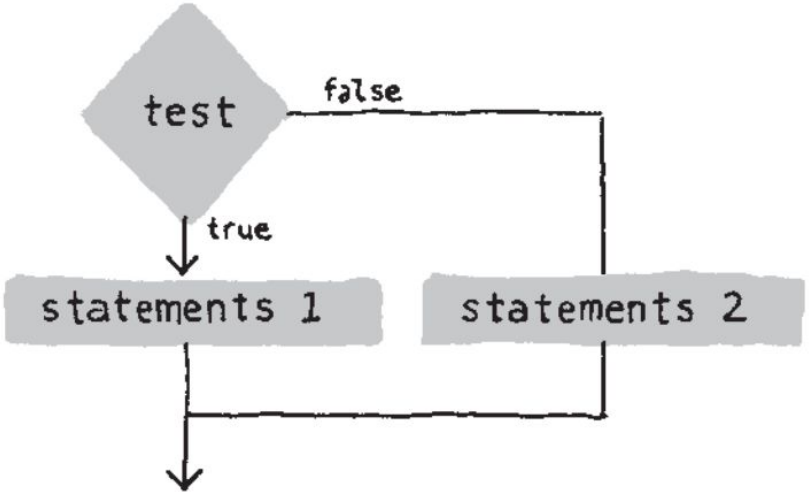
Anything written between these curly brackets will be *executed only if the condition is* **true**

```
} else {
```

Anything written between these curly brackets will be *executed only if the condition is* **false**

```
}
```

if-else




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

Example

```
int i = 3; //change this value to 8 to test
if ( i < 5) {
    println("the value in i is less than 5");
} else {
    println("i is not less than 5");
}
```

Exercise - what is the output of this code?

```
int i = 2;
if ( i < 5) {
    i = i + 2;
} else {
    i = 6;
}
println(i);
```

Question 3. - play Processing 20 questions

Two teams per table
1 team think of a processing function
The other team guess which the Processing function by asking 20 questions that can be answered yes or not.

Use nested if and if-else structures to write your plain english algorithm to guess Processing functions

Examples of functions are: size, background, ellipse, circle, fill, etc…

Let’s write the card game in Processing

4. Complete the algorithm shown in question 2 so we could write a Processing program for it.

Think: what information should be stored in variables?

You can use plain English

5. Which variables should we declare

Question 6 - Review Code style

- Go to the class website
  - Download square_example.pde
  - Modify it to use good variable names (if there are any), correct indentation and spacing, and comments

square_example.pde

```
void setup() { size(200, 200) ;} void draw(){
background(100, 200, 250);
fill(0, 0, 255);
if (mousePressed) {
if (mouseX > 100) {
fill(255, 0, 0);
}}
if (    mouseButton ==  RIGHT) {
background(0, 0, 0  );
strokeWeight(7);
}                    rect(50, 50, 100, 100  ) ;}
```