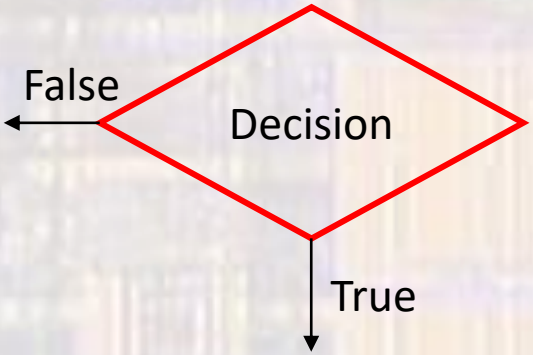
If - Else

Last updated 8/31/21

If-Else

- Two way decisions



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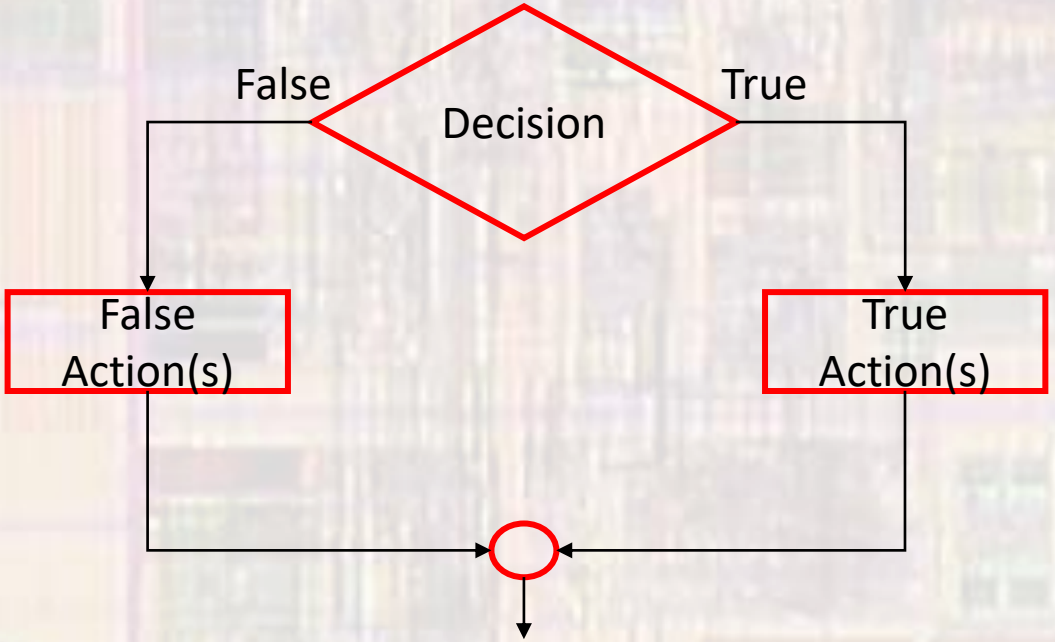
If-Else

- Two way decisions
  - if … else

```
…
if (expression)
    statement 1
else
    statement 2
…
```



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If-Else

- if - else – Rules

1) expression must be in parenthesis
2) no semicolon (unless statements need one)
3) expression can have side effects
4) statements can be anything – including another if-else
5) statement 1 and statement 2 must be a single statement – but remember we can use {…} to combine multiple statements to be considered one statement

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If-Else

- Examples

```
if (j == 1)
        a++;
else
        a--;


if (j <= 5){
        a++;                    // compound statement
        b = a + 3;
}
else
        a--;
```


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If-Else

- Examples

```
if (j == 1)
        a++;
else
        ;                       // null else statement

if (j <= 5){
        a++;
        b = a + 3;
}                               // null else statement (nothing at all)
```

This may be clearer in some cases

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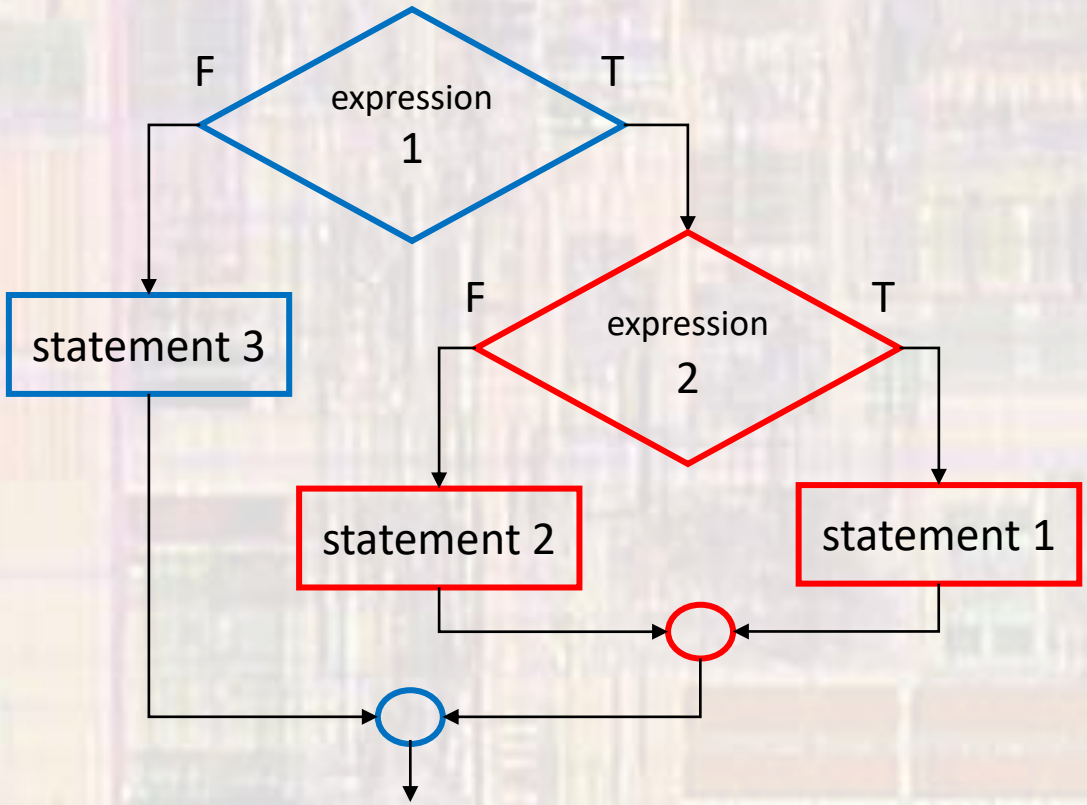
If-Else

- Nested if-else

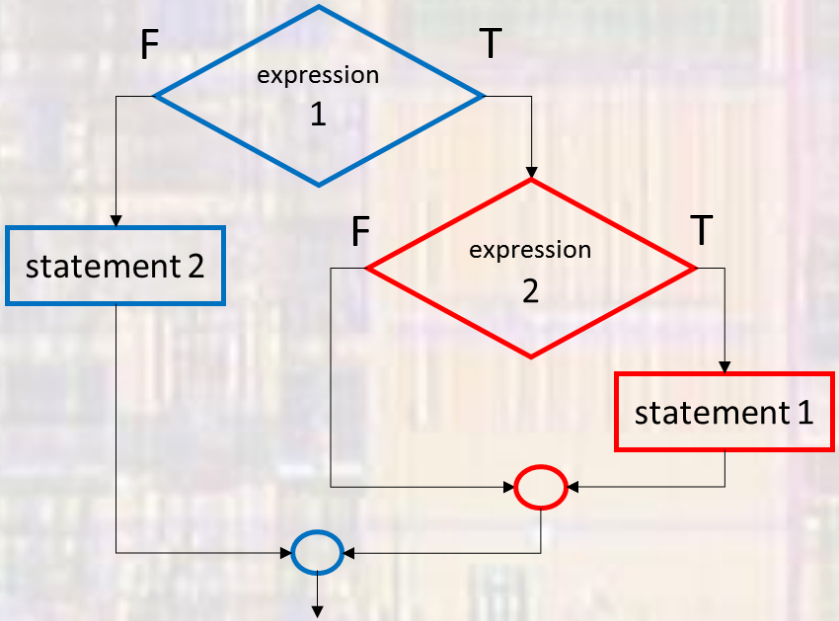
```
if (expression 1)
   if (expression 2)
      statement 1
   else
      statement 2
else
   statement 3
```



If-Else

- Nested if-else – possible error

Desired



Code Attempt

```
if (expression 1)
   if (expression 2)
      statement 1
else
   statement 2
```

Not what you expect

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If-Else

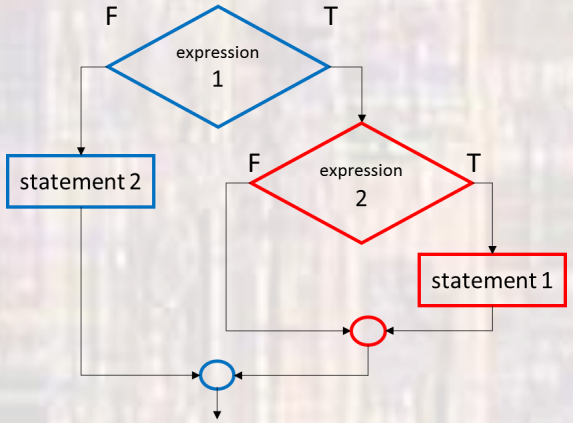
- Nested if-else – possible error
  - else is paired with the most recent if

```
if (expression 1)
  if (expression 2)
    statement 1
else
  statement 2
```

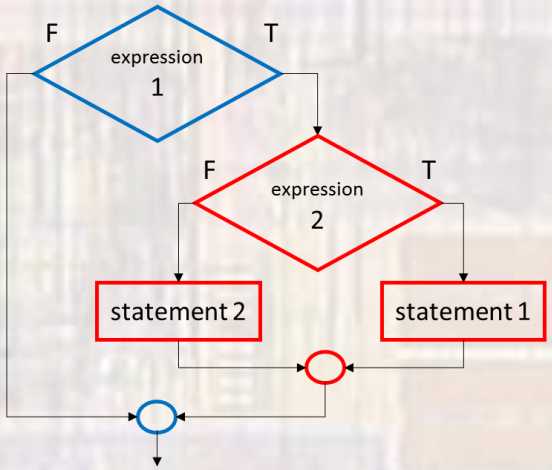
Indentation is for clarity
it has no effect

```
if (expression 1)
  if (expression 2)
    statement 1
else →
    statement 2
```

Desired →



Actual →



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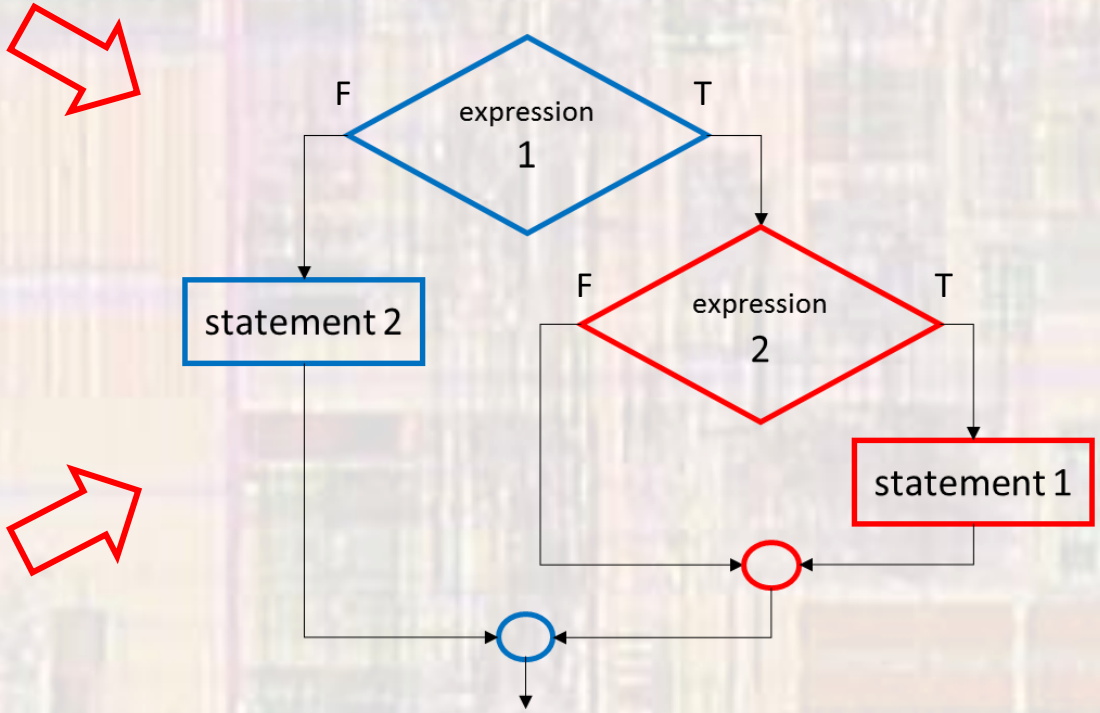
If-Else

- Nested if-else – correct structure
  - else is paired with the most recent if

```
if (expression 1)
  if (expression 2)
    statement 1
  else
    ;
else
  statement 2
```

```
if (expression 1){
  if (expression 2)
    statement 1
  }
else
  statement 2
```



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If-Else

- Expression Examples

```
if (a < b){

if (!a){

if ((a – b) > 0){

if (myChar == ‘a’){

if (a == 2){          // always do this
if (a = 0){           // arggggg, never do this

if (a == 0 || b && !c){
```

Some compilers will give you a warning – others will not

Either way the expression is still evaluated – in this example it has the value 0 (false)

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If-Else

- Practice
  - If myChar is the letter e (small or capital), make it the same capitalization but an f
  - If a is positive, decrement it, otherwise increment it
  - If either a or b are false, increment c, otherwise set c equal to 5
  - Assume a and b are floats. If they are equal clear a.

    This is actually very difficult to guarantee what you want

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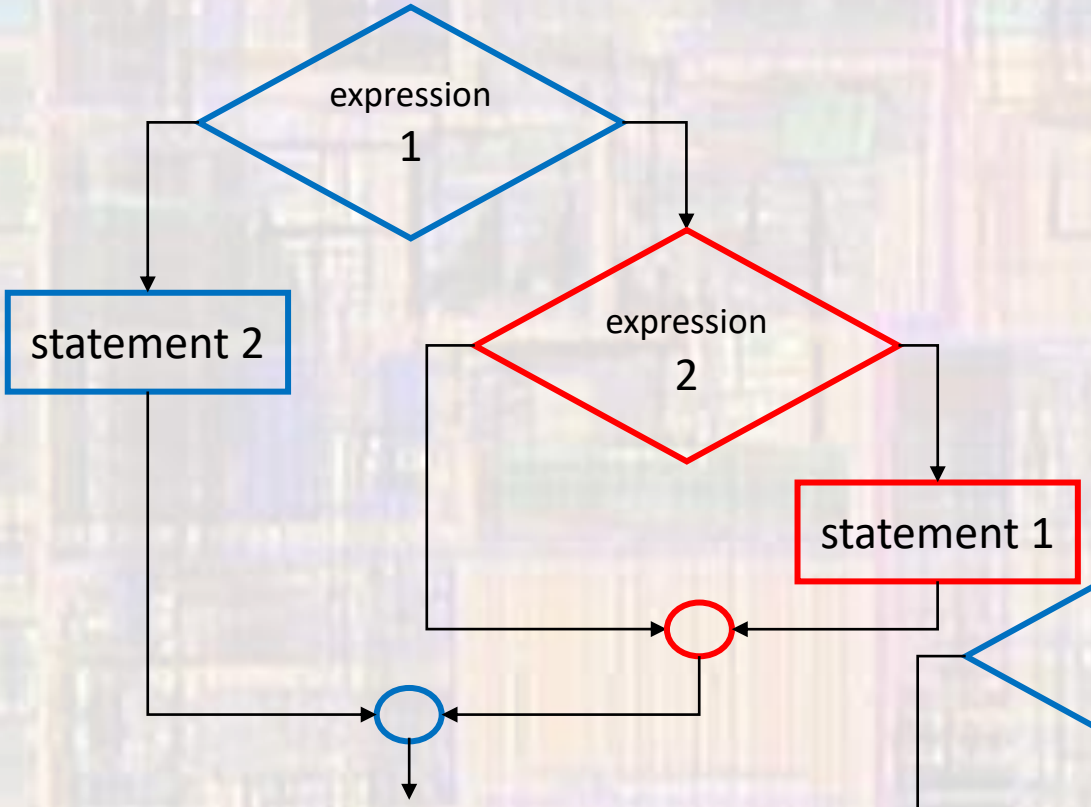
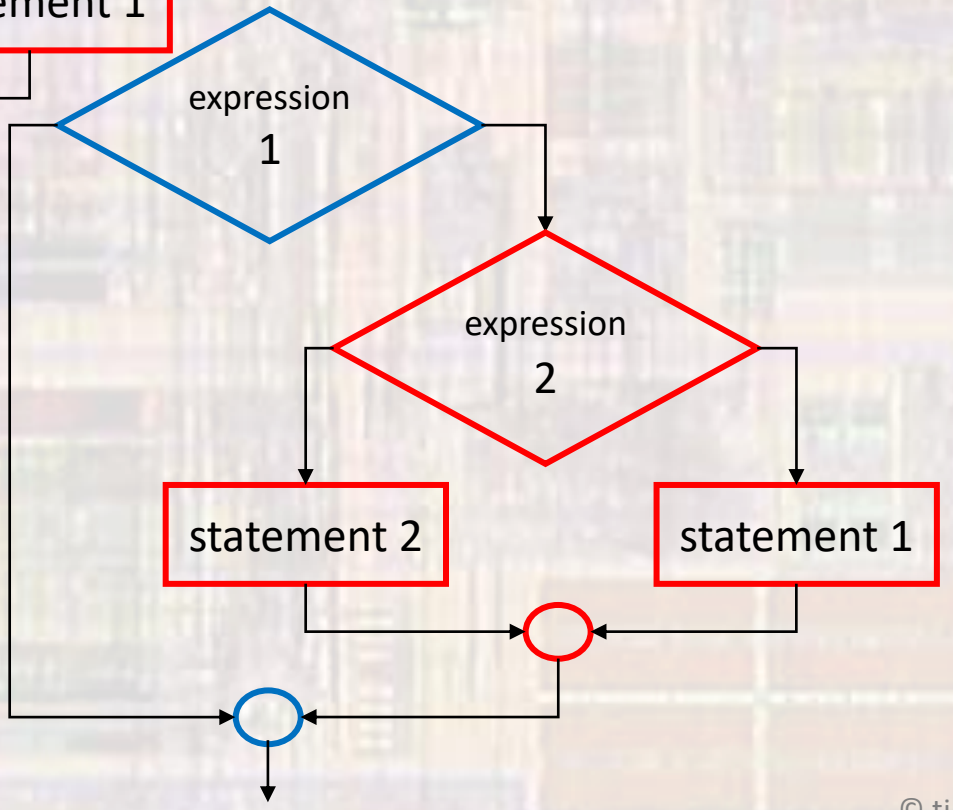

expression
1
statement 2
expression
2
statement 1


expression
1
expression
2
statement 2
statement 1

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