For

Last updated 6/19/2023
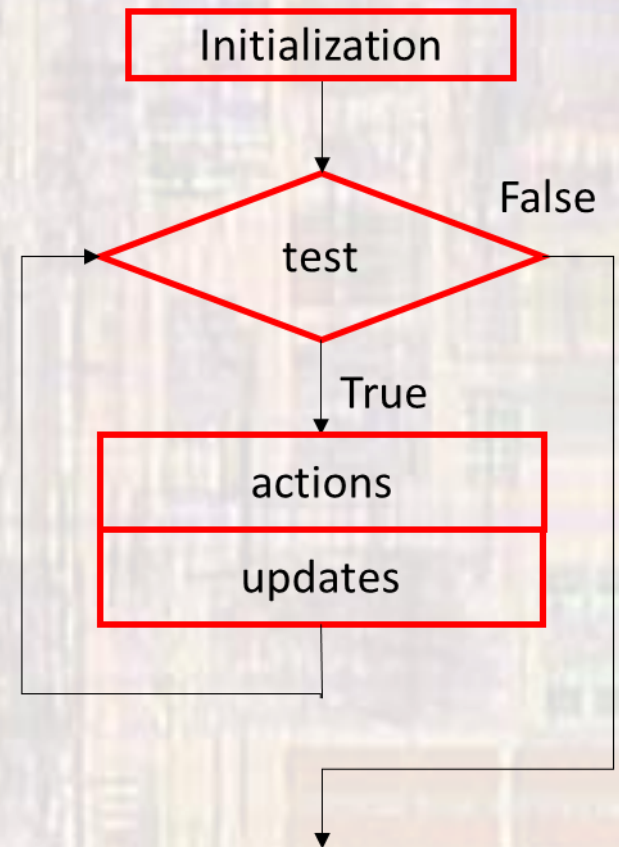
These slides introduce the for construct

For

- Structure

  for(*exp1; exp2; exp3*)
    statement;

  exp1 -> initialization
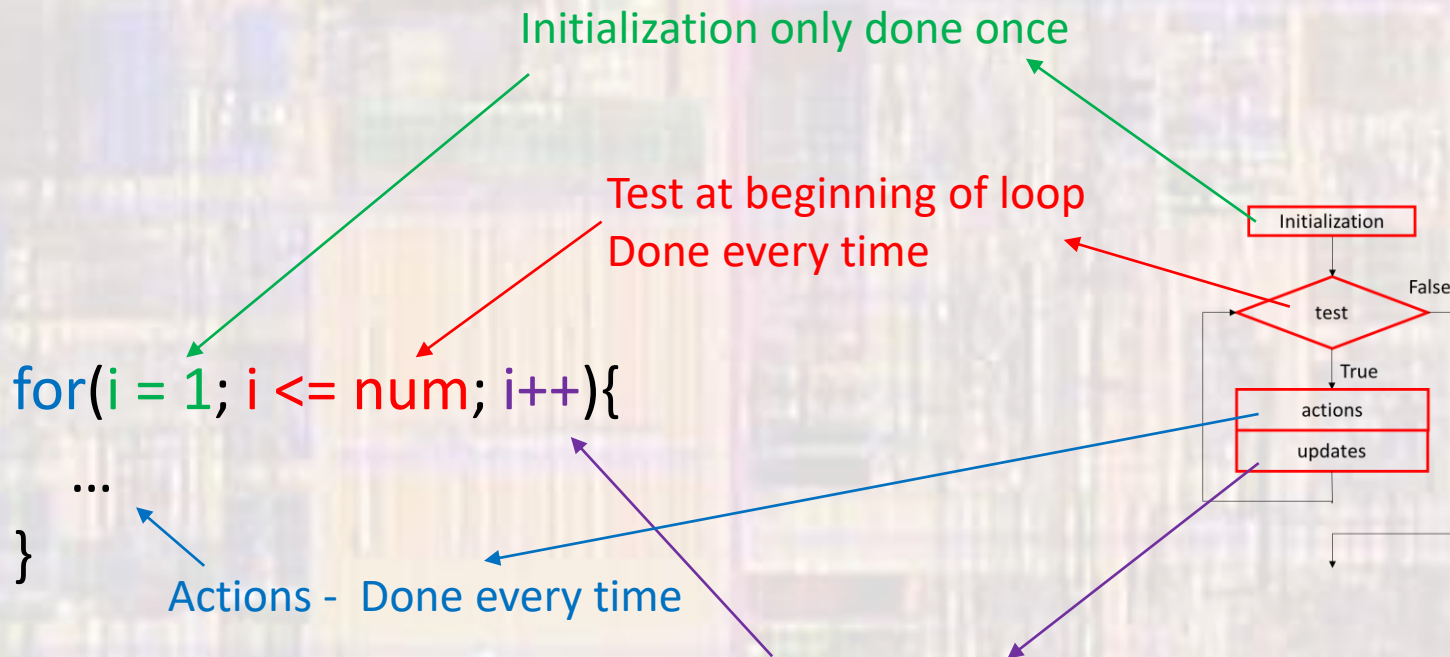 exp2 -> test
  exp3 -> update

- exp2 (test) is evaluated logically
- Typically used in counter-controlled loops

For

- Structure

Initialization only done once

Test at beginning of loop
Done every time

for(i = 1; i <= num; i++){

...

}

Actions - Done every time

Expression 3 (update) evaluates after the
entire for statement is evaluated
i.e. at the end of the loop
Done every time
No semi-colon

Initialization

False

test

True

actions

updates

For

- Example
  - Factorial – num!

```
int fact(int num){
    int fact;
    int i;
    fact = 1;
    for(i = 1; i <= num; i++){
        fact = fact * i;
    }
    return fact;
}
```
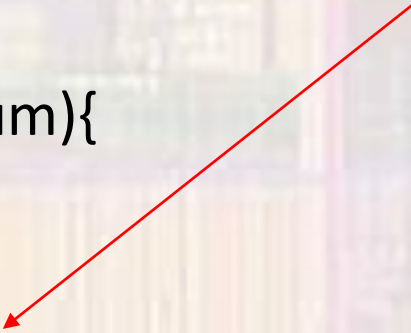
For

- Example
  - Factorial – num!

comma separated expressions
multi-part initializations
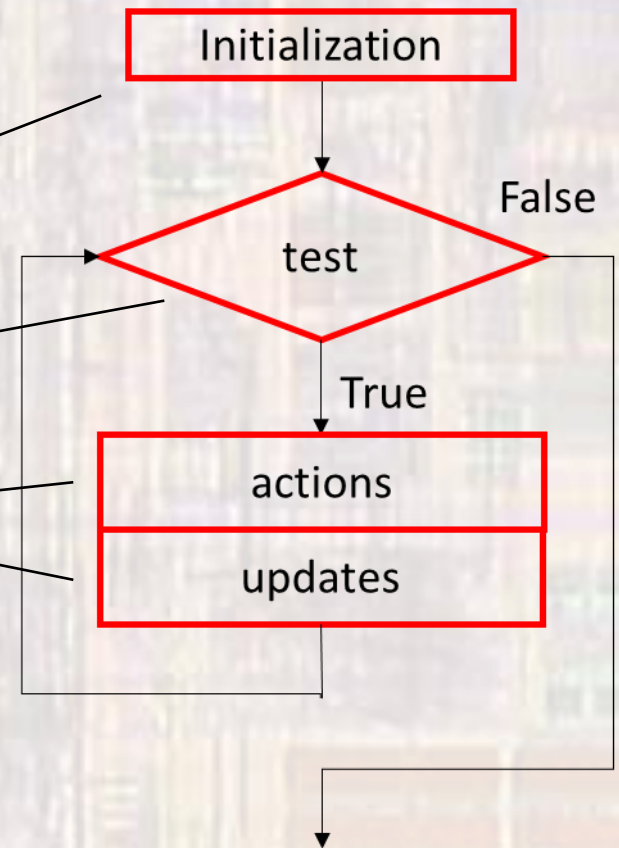
```
int fact(int num){
    int i;
    int fact;
    for(i = 1, fact = 1; i <= num; i++){
        fact = fact * i;
    }
    return fact;
}
```
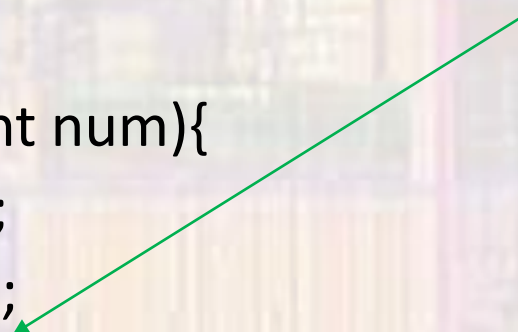
For

- Example
  - Factorial – num!

```
int fact(int num){
    int fact;
    fact = 1;
    for(int i = 1; i <= num; i++){
        fact = fact * i;
    }
    return fact;
}
```

declaration included
in initialization

Not always supported
We will not do this

For

- Examples

int a;
int b;
b = 5;

for(a = 0; a < 10; a++){

for(a = 9; a >=0; a--){

for(a = 2; a - b; a = a + 2){