For

Last updated 10/29/20

For

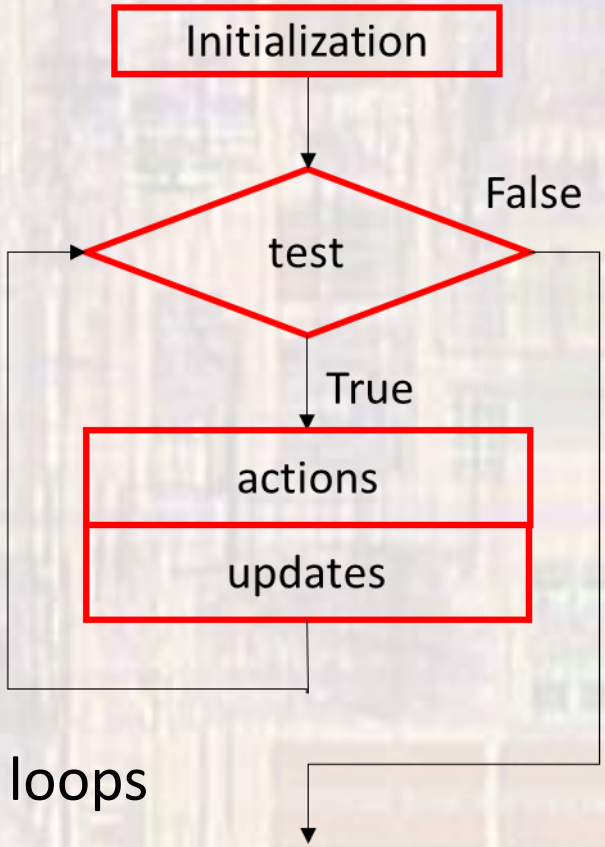
- These slides introduce the for loop
- Upon completion: You should be able to interpret and code solutions using the for loop

For

- For loop

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

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

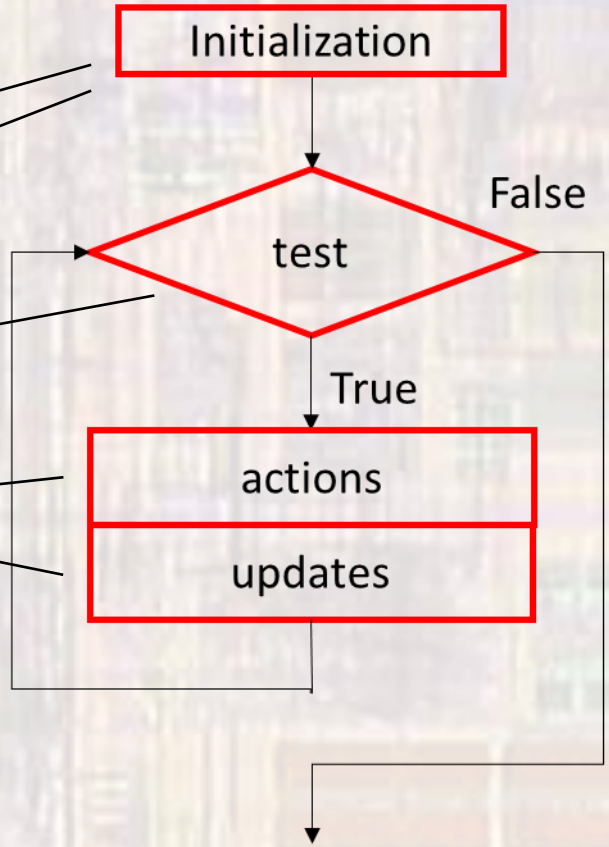


- Typically used in counter controlled loops

For

- For loop
  - Factorial – num!

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



For

- For loop
  - Factorial – num!

```
int fact(int num){
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      fact = fact * i;
   }
   return fact;
}
```

no semi-colon

Expression evaluates after the statement is evaluated → at the end of the for loop

For

- For loop
  - 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;
}
```

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

- For loop
  - 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

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

For

- For loop
  - Flash an LED tied to pin 3, starting at 1 flash, up to N flashes N=5 -> ^_^^_^^^_^^^^_^^^^^_^_^^…

```
/*
 * repetition2_msp.c
 *
 *  Created on: Feb 17, 2017
 *      Author: Tim
 */
//  flash an LED an increasing number of times

#include "msp432.h"

void flash(int n);

int main(void){
   // Pins
   // note: pin 3 is Port 3 bit 2
   P3->DIR |= 0x04;  // set pin 3 to output
   P3->OUT &= ~0x04; // initialize to off
   //
   // Increment count and then call flash
   //
   while(1){
       int count;
       count = 5;   // for testing
       flash(count);
   } // end while
   return 0;
} // end main
```

For

- For loop
  - Flash an LED tied to pin 3, starting at 1 flash, up to N flashes N=5 -> ^_^^_^^^_^^^^_^^^^^_^_^^…

```
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   //
   // Increment count and then call flash
   //
   while(1){
       int count;
       count = 5;   // for testing
       flash(count);
   } // end while
   return 0;
} // end main
```

```
void flash(int n){
   int i;
   int j;
   for(i=1; i<=n; i++){
       for(j=1; j<=i; j++){
           P3->OUT |= 0x04;
           __delay_cycles(3000000);
           P3->OUT &= ~0x04;
           __delay_cycles(3000000);
       } // end for
       __delay_cycles(3000000 * 4);
   } // end for
   return;
} // end flash
```