

# CSci 127: Introduction to Computer Science



[hunter.cuny.edu/csci](https://hunter.cuny.edu/csci)

# Teacher Evaluation

- Please take a moment to fill out the **Teacher Evaluations**

# Teacher Evaluation

- Please take a moment to fill out the **Teacher Evaluations**
- Your chance to provide feedback!

# Teacher Evaluation

- Please take a moment to fill out the **Teacher Evaluations**
- Your chance to provide feedback!
- Responses are **completely anonymous**.

# Teacher Evaluation

- Please take a moment to fill out the **Teacher Evaluations**
- Your chance to provide feedback!
- Responses are **completely anonymous**.
- **INCENTIVE:** if we reach 75% of submitted evaluations, I will drop the 6th lowest program grade.
- Smartphone: [www.hunter.cuny.edu/mobilete](http://www.hunter.cuny.edu/mobilete)

# Teacher Evaluation

- Please take a moment to fill out the **Teacher Evaluations**
- Your chance to provide feedback!
- Responses are **completely anonymous**.
- **INCENTIVE:** if we reach 75% of submitted evaluations, I will drop the 6th lowest program grade.
- Smartphone: [www.hunter.cuny.edu/mobilete](http://www.hunter.cuny.edu/mobilete)
- Computer: [www.hunter.cuny.edu/te](http://www.hunter.cuny.edu/te)

# Teacher Evaluation

- Please take a moment to fill out the **Teacher Evaluations**
- Your chance to provide feedback!
- Responses are **completely anonymous**.
- **INCENTIVE:** if we reach 75% of submitted evaluations, I will drop the 6th lowest program grade.
- Smartphone: [www.hunter.cuny.edu/mobilete](http://www.hunter.cuny.edu/mobilete)
- Computer: [www.hunter.cuny.edu/te](http://www.hunter.cuny.edu/te)

# Announcements

- **Final Exam Monday 23 May**



# Announcements

- **Final Exam Monday 23 May**
- **Seating assignment available on Blackboard/My Grades**  
**Please check now**, if there are any problems, email me ASAP

# Announcements

- **Final Exam Monday 23 May**
- **Seating assignment available on Blackboard/My Grades**  
**Please check now**, if there are any problems, email me ASAP
- **Next Tuesday 17 May, we will have a Mock Exam**

# Announcements

- **Final Exam Monday 23 May**
- **Seating assignment available on Blackboard/My Grades**  
**Please check now**, if there are any problems, email me ASAP
- **Next Tuesday 17 May, we will have a Mock Exam**
  - ▶ Room 118 Hunter North (Assembly Hall), ground floor of the North Building

# Announcements

- **Final Exam Monday 23 May**
- **Seating assignment available on Blackboard/My Grades**  
**Please check now**, if there are any problems, email me ASAP
- **Next Tuesday 17 May, we will have a Mock Exam**
  - ▶ Room 118 Hunter North (Assembly Hall), ground floor of the North Building
  - ▶ Only 1.15 hours for the Mock, 2 hours for the real exam.

# Announcements

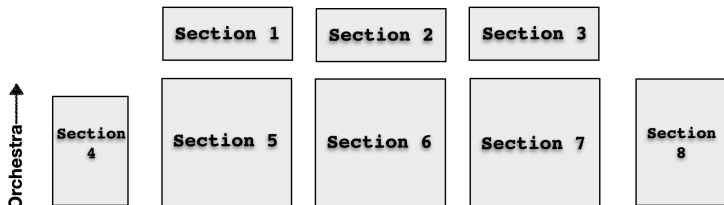
- **Final Exam Monday 23 May**
- **Seating assignment available on Blackboard/My Grades**  
**Please check now**, if there are any problems, email me ASAP
- **Next Tuesday 17 May, we will have a Mock Exam**
  - ▶ Room 118 Hunter North (Assembly Hall), ground floor of the North Building
  - ▶ Only 1.15 hours for the Mock, 2 hours for the real exam.
  - ▶ Just a practice run, this WILL NOT be the same as the real exam, and it will not be graded.

# CSci 127: Introduction to Computer Science

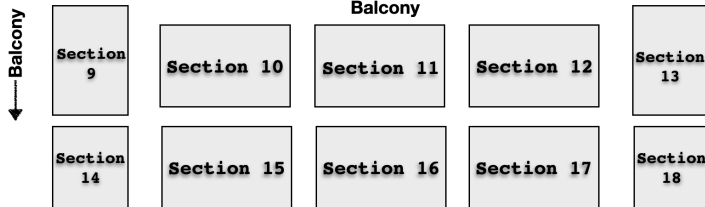
## CSci 127 Final Exam

*Seating alphabetical in each section. See Blackboard for assigned seating section.*

### Stage



### Balcony



Back Wall of Second Floor Balcony

# Frequently Asked Questions

- What's the best way to study for the final exam?

# Frequently Asked Questions

- What's the best way to study for the final exam?

*The final exam problems are variations on the homework, quizzes, lecture examples, and lecture previews.*



# Frequently Asked Questions

- What's the best way to study for the final exam?

*The final exam problems are variations on the homework, quizzes, lecture examples, and lecture previews.*

*Past exams (and answer keys) are on-line. Do 7-10 previous exams: allow 1 hour (half time) and work through , grade yourself, update note sheet, and repeat.*

# Frequently Asked Questions

- What's the best way to study for the final exam?

*The final exam problems are variations on the homework, quizzes, lecture examples, and lecture previews.*

*Past exams (and answer keys) are on-line. Do 7-10 previous exams: allow 1 hour (half time) and work through , grade yourself, update note sheet, and repeat.*

- I'm worried about my grade. Should I do Pass/NoCredit?

# Frequently Asked Questions

- What's the best way to study for the final exam?

*The final exam problems are variations on the homework, quizzes, lecture examples, and lecture previews.*

*Past exams (and answer keys) are on-line. Do 7-10 previous exams: allow 1 hour (half time) and work through , grade yourself, update note sheet, and repeat.*

- I'm worried about my grade. Should I do Pass/NoCredit?

*It's fine with us, but check with your advisor to make sure it's accepted for your program of study.*

# Frequently Asked Questions

- What's the best way to study for the final exam?

*The final exam problems are variations on the homework, quizzes, lecture examples, and lecture previews.*

*Past exams (and answer keys) are on-line. Do 7-10 previous exams: allow 1 hour (half time) and work through , grade yourself, update note sheet, and repeat.*

- I'm worried about my grade. Should I do Pass/NoCredit?

*It's fine with us, but check with your advisor to make sure it's accepted for your program of study.*

*Deadline: Friday, April 15, 2022, 11:59 PM (EST)*

# Frequently Asked Questions

- What's the best way to study for the final exam?

*The final exam problems are variations on the homework, quizzes, lecture examples, and lecture previews.*

*Past exams (and answer keys) are on-line. Do 7-10 previous exams: allow 1 hour (half time) and work through , grade yourself, update note sheet, and repeat.*

- I'm worried about my grade. Should I do Pass/NoCredit?

*It's fine with us, but check with your advisor to make sure it's accepted for your program of study.*

*Deadline: Friday, April 15, 2022, 11:59 PM (EST)*

- Why do you care about cheating?

# Frequently Asked Questions

- What's the best way to study for the final exam?

*The final exam problems are variations on the homework, quizzes, lecture examples, and lecture previews.*

*Past exams (and answer keys) are on-line. Do 7-10 previous exams: allow 1 hour (half time) and work through , grade yourself, update note sheet, and repeat.*

- I'm worried about my grade. Should I do Pass/NoCredit?

*It's fine with us, but check with your advisor to make sure it's accepted for your program of study.*

*Deadline: Friday, April 15, 2022, 11:59 PM (EST)*

- Why do you care about cheating?

*First: it gives unfair advantage & is immoral.*

# Frequently Asked Questions

- What's the best way to study for the final exam?

*The final exam problems are variations on the homework, quizzes, lecture examples, and lecture previews.*

*Past exams (and answer keys) are on-line. Do 7-10 previous exams: allow 1 hour (half time) and work through , grade yourself, update note sheet, and repeat.*

- I'm worried about my grade. Should I do Pass/NoCredit?

*It's fine with us, but check with your advisor to make sure it's accepted for your program of study.*

*Deadline: Friday, April 15, 2022, 11:59 PM (EST)*

- Why do you care about cheating?

*First: it gives unfair advantage & is immoral.*

*Second: it degrades the quality of our students.*

# Frequently Asked Questions

- What's the best way to study for the final exam?

*The final exam problems are variations on the homework, quizzes, lecture examples, and lecture previews.*

*Past exams (and answer keys) are on-line. Do 7-10 previous exams: allow 1 hour (half time) and work through , grade yourself, update note sheet, and repeat.*

- I'm worried about my grade. Should I do Pass/NoCredit?

*It's fine with us, but check with your advisor to make sure it's accepted for your program of study.*

*Deadline: Friday, April 15, 2022, 11:59 PM (EST)*

- Why do you care about cheating?

*First: it gives unfair advantage & is immoral.*

*Second: it degrades the quality of our students.*

*Third: it's a standard question on faculty references.*



# Frequently Asked Questions

- What's the best way to study for the final exam?

*The final exam problems are variations on the homework, quizzes, lecture examples, and lecture previews.*

*Past exams (and answer keys) are on-line. Do 7-10 previous exams: allow 1 hour (half time) and work through , grade yourself, update note sheet, and repeat.*

- I'm worried about my grade. Should I do Pass/NoCredit?

*It's fine with us, but check with your advisor to make sure it's accepted for your program of study.*

*Deadline: Friday, April 15, 2022, 11:59 PM (EST)*

- Why do you care about cheating?

*First: it gives unfair advantage & is immoral.*

*Second: it degrades the quality of our students.*

*Third: it's a standard question on faculty references.*

*Industry & graduate schools hate it: don't want someone who falsifies work.*

# Today's Topics

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

- Recap: I/O & Definite Loops in C++
- Conditionals in C++
- Indefinite Loops in C++
- Recap: C++ & Python

# Today's Topics

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

- **Recap: I/O & Definite Loops in C++**
- Conditionals in C++
- Indefinite Loops in C++
- Recap: C++ & Python

## Recap: Basic Form & I/O in C++

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

# Recap: Basic Form & I/O in C++

- Efficient for systems programming.

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

# Recap: Basic Form & I/O in C++

- Efficient for systems programming.
- Programs are organized in functions.

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

# Recap: Basic Form & I/O in C++

- Efficient for systems programming.
- Programs are organized in functions.
- Must declare variables:

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

# Recap: Basic Form & I/O in C++

- Efficient for systems programming.
- Programs are organized in functions.
- Must declare variables: `int num;`

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```



# Recap: Basic Form & I/O in C++

- Efficient for systems programming.
- Programs are organized in functions.
- Must declare variables: `int num;`
- Many types available:

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

# Recap: Basic Form & I/O in C++

- Efficient for systems programming.
- Programs are organized in functions.
- Must declare variables: `int num;`
- Many types available:  
`int, float, char, ...`

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

# Recap: Basic Form & I/O in C++

- Efficient for systems programming.
- Programs are organized in functions.
- Must declare variables: `int num;`
- Many types available:  
`int, float, char, ...`
- To print:

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

# Recap: Basic Form & I/O in C++

- Efficient for systems programming.
- Programs are organized in functions.
- Must declare variables: `int num;`
- Many types available:  
`int, float, char, ...`
- To print: `cout << "Hello!!";`

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

# Recap: Basic Form & I/O in C++

- Efficient for systems programming.
- Programs are organized in functions.
- Must declare variables: `int num;`
- Many types available:  
`int, float, char, ...`
- To print: `cout << "Hello!!";`
- To get input:

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

# Recap: Basic Form & I/O in C++

- Efficient for systems programming.
- Programs are organized in functions.
- Must declare variables: `int num;`
- Many types available:  
`int, float, char, ...`
- To print: `cout << "Hello!!";`
- To get input: `cin >> num;`

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

# Recap: Basic Form & I/O in C++

- Efficient for systems programming.
- Programs are organized in functions.
- Must declare variables: `int num;`
- Many types available:  
`int, float, char, ...`
- To print: `cout << "Hello!!";`
- To get input: `cin >> num;`
- To use those I/O functions:

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

# Recap: Basic Form & I/O in C++

- Efficient for systems programming.
- Programs are organized in functions.
- Must declare variables: `int num;`
- Many types available:  
`int, float, char, ...`
- To print: `cout << "Hello!!";`
- To get input: `cin >> num;`
- To use those I/O functions:  
`#include <iostream>`  
`using namespace std;`

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```



# Recap: Basic Form & I/O in C++

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

- Efficient for systems programming.
- Programs are organized in functions.
- Must declare variables: `int num;`
- Many types available:  
`int, float, char, ...`
- To print: `cout << "Hello!!";`
- To get input: `cin >> num;`
- To use those I/O functions:  
`#include <iostream>`  
`using namespace std;`
- Definite loops:

# Recap: Basic Form & I/O in C++

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

- Efficient for systems programming.
- Programs are organized in functions.
- Must declare variables: `int num;`
- Many types available:  
`int, float, char, ...`
- To print: `cout << "Hello!!";`
- To get input: `cin >> num;`
- To use those I/O functions:  
`#include <iostream>`  
`using namespace std;`
- Definite loops:  
`for (i = 0; i < 10; i++) {...}`

# Recap: Basic Form & I/O in C++

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

- Efficient for systems programming.
- Programs are organized in functions.
- Must declare variables: `int num;`
- Many types available:  
`int, float, char, ...`
- To print: `cout << "Hello!!";`
- To get input: `cin >> num;`
- To use those I/O functions:  
`#include <iostream>`  
`using namespace std;`
- Definite loops:  
`for (i = 0; i < 10; i++) {...}`
- Blocks of code uses '{' and '}'.

# Recap: Basic Form & I/O in C++

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

- Efficient for systems programming.
- Programs are organized in functions.
- Must declare variables: `int num;`
- Many types available:  
`int, float, char, ...`
- To print: `cout << "Hello!!";`
- To get input: `cin >> num;`
- To use those I/O functions:  
`#include <iostream>`  
`using namespace std;`
- Definite loops:  
`for (i = 0; i < 10; i++) {...}`
- Blocks of code uses '{' and '}'.
- Commands generally end in ';'.

# Today's Topics

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

- Recap: I/O & Definite Loops in C++
- **Conditionals in C++**
- Indefinite Loops in C++
- Recap: C++ & Python

# Challenge:

Predict what the following pieces of code will do:

```
//Demonstrates conditionals
#include <iostream>
using namespace std;

int main ()
{
    int yearBorn;
    cout << "Enter year born: ";
    cin >> yearBorn;
    if (yearBorn < 1946)
    {
        cout << "Greatest Generation";
    }
    else if (yearBorn <= 1964)
    {
        cout << "Baby Boomer";
    }
    else if (yearBorn <= 1984)
    {
        cout << "Generation X";
    }
    else if (yearBorn <= 2004)
    {
        cout << "Millennial";
    }
    else
    {
        cout << "TBD";
    }
}
```

return 0:

CSci 127 (Hunter)

```
using namespace std;
```

```
int main ()
{
```

```
    string conditions = "blowing snow";
    int winds = 100;
    float visibility = 0.2;
```

```
    if ( ( (winds > 35) && (visibility < 0.25) ) &&
        ( (conditions == "blowing snow") ||
          (conditions == "heavy snow") ) )
        cout << "Blizzard!\n";
```

```
    string origin = "South Pacific";
```

```
    if (winds > 74)
        cout << "Major storm, called a ";
    if ((origin == "Indian Ocean")
        || (origin == "South Pacific"))
        cout << "cyclone.\n";
    else if (origin == "North Pacific")
        cout << "typhoon.\n";
    else
        cout << "hurricane.\n";
```

# C++ Demo

```
//Demonstrates conditionals
#include <iostream>
using namespace std;

int main ()
{
    int yearBorn;
    cout << "Enter year born: ";
    cin >> yearBorn;
    if (yearBorn < 1946)
    {
        cout << "Greatest Generation";
    }
    else if (yearBorn <= 1964)
    {
        cout << "Baby Boomer";
    }
    else if (yearBorn <= 1984)
    {
        cout << "Generation X";
    }
    else if (yearBorn <= 2004)
    {
        cout << "Millennial";
    }
    else
    {
        cout << "TBD";
    }

    return 0;
}
```

(Demo with onlinegdb)

# Conditionals

General format:

```
if ( logical expression )
{
    command1;
    ...
}
else if ( logical expression )
{
    command1;
    ...
}
else
{
    command1;
    ...
}
```

```
//Demonstrates conditionals
#include <iostream>
using namespace std;

int main ()
{
    int yearBorn;
    cout << "Enter year born: ";
    cin >> yearBorn;
    if (yearBorn < 1946)
    {
        cout << "Greatest Generation";
    }
    else if (yearBorn <= 1964)
    {
        cout << "Baby Boomer";
    }
    else if (yearBorn <= 1984)
    {
        cout << "Generation X";
    }
    else if (yearBorn <= 2004)
    {
        cout << "Millennial";
    }
    else
    {
        cout << "TBD";
    }
    return 0;
}
```



# Logical Operators in C++

Very similar, just different names: `&&`, `||`, and `!`:

# Logical Operators in C++

Very similar, just different names: `&&`, `||`, and `!`:

## **and (&&)**

in1		in2	<i>returns:</i>
False	<code>&amp;&amp;</code>	False	False
False	<code>&amp;&amp;</code>	True	False
True	<code>&amp;&amp;</code>	False	False
True	<code>&amp;&amp;</code>	True	True

# Logical Operators in C++

Very similar, just different names: `&&`, `||`, and `!`:

## and (`&&`)

in1		in2	<i>returns:</i>
False	<code>&amp;&amp;</code>	False	False
False	<code>&amp;&amp;</code>	True	False
True	<code>&amp;&amp;</code>	False	False
True	<code>&amp;&amp;</code>	True	True

## or (`||`)

in1		in2	<i>returns:</i>
False	<code>  </code>	False	False
False	<code>  </code>	True	True
True	<code>  </code>	False	True
True	<code>  </code>	True	True

# Logical Operators in C++

Very similar, just different names: `&&`, `||`, and `!`:

## and (`&&`)

in1		in2	returns:
False	<code>&amp;&amp;</code>	False	False
False	<code>&amp;&amp;</code>	True	False
True	<code>&amp;&amp;</code>	False	False
True	<code>&amp;&amp;</code>	True	True

## or (`||`)

in1		in2	returns:
False	<code>  </code>	False	False
False	<code>  </code>	True	True
True	<code>  </code>	False	True
True	<code>  </code>	True	True

## not (`!`)

	in1	returns:
<code>!</code>	False	True
<code>!</code>	True	False

# Lecture Slip

- Write a C++ program that will ask for the time in 24 hour format and, knowing it is morning before 12pm and evening after 6pm (18), it will print out "Morning", "Afternoon" or "Evening".

# Today's Topics

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

- Recap: I/O & Definite Loops in C++
- Conditionals in C++
- **Indefinite Loops in C++**
- Recap: C++ & Python

# Challenge:

Predict what the following pieces of code will do:

```
///While Growth Example
#include <iostream>
using namespace std;

int main ()
{
    int population = 100;
    int year = 0;
    cout << "Year\tPopulation\n";
    while(population < 1000)
    {
        cout << year << "\t\t" << population << "\n";
        population = population * 2;
        year++;
    }
    return 0;
}
```

# C++ Demo

```
///While Growth Example
#include <iostream>
using namespace std;

int main ()
{
    int population = 100;
    int year = 0;
    cout << "Year\tPopulation\n";
    while(population < 1000)
    {
        cout << year << "\t\t" << population << "\n";
        population = population * 2;
        year++;
    }
    return 0;
}
```

(Demo with onlinegdb)



# Indefinite Loops: while

```
///While Growth Example
#include <iostream>
using namespace std;

int main ()
{
    int population = 100;
    int year = 0;
    cout << "Year\\tPopulation\\n";
    while(population < 1000)
    {
        cout << year << "\\t\\t" << population << "\\n";
        population = population * 2;
        year++;
    }
    return 0;
}
```

General format:

```
while ( logical expression )
{
    command1;
    command2;
    command3;
    ...
}
```

# Challenge:

Predict what the following piece of code will do:

```
//Demonstrates loops
#include <iostream>
using namespace std;

int main ()
{
    int num;
    cout << "Enter an even number: ";
    cin >> num;
    while (num % 2 != 0)
    {
        cout << "\nThat's odd!\n";
        cout << "Enter an even number: ";
        cin >> num;
    }
    cout << "You entered: "
         << num << ".\n";
    return 0;
}
```

# C++ Demo

```
//Demonstrates loops
#include <iostream>
using namespace std;

int main ()
{
    int num;
    cout << "Enter an even number: ";
    cin >> num;
    while (num % 2 != 0)
    {
        cout << "\nThat's odd!\n";
        cout << "Enter an even number: ";
        cin >> num;
    }
    cout << "You entered: "
         << num << ".\n";
    return 0;
}
```

(Demo with onlinegdb)

# Indefinite Loops: while

```
//Demonstrates loops
#include <iostream>
using namespace std;

int main ()
{
    int num;
    cout << "Enter an even number: ";
    cin >> num;
    while (num % 2 != 0)
    {
        cout << "\nThat's odd!\n";
        cout << "Enter an even number: ";
        cin >> num;
    }
    cout << "You entered: "
        << num << ".\n";
    return 0;
}
```

General format:

```
while ( logical expression )
{
    command1;
    command2;
    command3;
    ...
}
```

# Challenge:

Predict what the following pieces of code will do:

```
//Demonstrates do-while loops
#include <iostream>
using namespace std;

int main ()
{
    int num;
    do
    {
        cout << "Enter an even number: ";
        cin >> num;
    } while (num % 2 != 0);

    cout << "You entered: "
         << num << ".\n";
    return 0;
}
```

# C++ Demo

```
//Demonstrates do-while loops
#include <iostream>
using namespace std;

int main ()
{
    int num;
    do
    {
        cout << "Enter an even number: ";
        cin >> num;
    } while (num % 2 != 0);

    cout << "You entered: "
         << num << ".\n";
    return 0;
}
```

(Demo with onlinegdb)

# Indefinite Loops: do-while

```
//Demonstrates do-while loops
#include <iostream>
using namespace std;

int main ()
{
    int num;
    do
    {
        cout << "Enter an even number: ";
        cin >> num;
    } while (num % 2 != 0);

    cout << "You entered: "
         << num << ".\n";
    return 0;
}
```

General format:

```
do
{
    command1;
    command2;
    command3;
    ...
} while ( logical expression );
```

# Today's Topics

```
//Another C++ program, demonstrating I/O & arithmetic
#include <iostream>
using namespace std;

int main ()
{
    float kg, lbs;
    cout << "Enter kg: ";
    cin >> kg;
    lbs = kg * 2.2;
    cout << endl << "Lbs: " << lbs << "\n\n";
    return 0;
}
```

- Recap: I/O & Definite Loops in C++
- Conditionals in C++
- Indefinite Loops in C++
- **Recap: C++ & Python**



# Recap: C++ Control Structures

- I/O:

```
//Another C++ program; Demonstrates loops
#include <iostream>
using namespace std;

int main ()
{
    int i,j;
    for (i = 0; i < 4; i++)
    {
        cout << "The world turned upside down...\n";
    }

    for (j = 10; j > 0; j--)
    {
        cout << j << " ";
    }
    cout << "Blast off!!!" << endl;

    return 0;
}
```

# Recap: C++ Control Structures

- I/O: `cin >> ...;`

```
//Another C++ program; Demonstrates loops
#include <iostream>
using namespace std;

int main ()
{
    int i,j;
    for (i = 0; i < 4; i++)
    {
        cout << "The world turned upside down...\n";
    }

    for (j = 10; j > 0; j--)
    {
        cout << j << " ";
    }
    cout << "Blast off!!" << endl;

    return 0;
}
```

# Recap: C++ Control Structures

- I/O: `cin >> ...;` & `cout << ...;`

```
//Another C++ program; Demonstrates loops
#include <iostream>
using namespace std;

int main ()
{
    int i,j;
    for (i = 0; i < 4; i++)
    {
        cout << "The world turned upside down...\n";
    }

    for (j = 10; j > 0; j--)
    {
        cout << j << " ";
    }
    cout << "Blast off!!!" << endl;

    return 0;
}
```

# Recap: C++ Control Structures

- I/O: `cin >> ...;` & `cout << ...;`
- Definite loops:

```
//Another C++ program; Demonstrates loops
#include <iostream>
using namespace std;

int main ()
{
    int i,j;
    for (i = 0; i < 4; i++)
    {
        cout << "The world turned upside down...\n";
    }

    for (j = 10; j > 0; j--)
    {
        cout << j << " ";
    }
    cout << "Blast off!!!" << endl;

    return 0;
}
```

# Recap: C++ Control Structures

- I/O: `cin >> ...; & cout << ...;`
- Definite loops:  
    `for (i = 0; i < 10; i++)`  
    {  
        ...  
    }

```
//Another C++ program; Demonstrates loops
#include <iostream>
using namespace std;

int main ()
{
    int i,j;
    for (i = 0; i < 4; i++)
    {
        cout << "The world turned upside down...\n";
    }

    for (j = 10; j > 0; j--)
    {
        cout << j << " ";
    }
    cout << "Blast off!!!" << endl;

    return 0;
}
```

# Recap: C++ Control Structures

- I/O: `cin >> ...;` & `cout << ...;`
- Definite loops:  
`for (i = 0; i < 10; i++)`  
`{`  
  
`...`   
`}`
- Conditionals:

```
//Another C++ program; Demonstrates loops
#include <iostream>
using namespace std;

int main ()
{
    int i,j;
    for (i = 0; i < 4; i++)
    {
        cout << "The world turned upside down...\n";
    }

    for (j = 10; j > 0; j--)
    {
        cout << j << " ";
    }
    cout << "Blast off!!!" << endl;

    return 0;
}
```

# Recap: C++ Control Structures

- I/O: `cin >> ...;` & `cout << ...;`

- Definite loops:

```
for (i = 0; i < 10; i++)  
{  
    ...  
}
```

- Conditionals:

```
if (logical expression)  
{  
    ...  
}  
else  
{  
    ...  
}
```

```
//Another C++ program; Demonstrates loops  
#include <iostream>  
using namespace std;  
  
int main ()  
{  
    int i,j;  
    for (i = 0; i < 4; i++)  
    {  
        cout << "The world turned upside down...\n";  
    }  
  
    for (j = 10; j > 0; j--)  
    {  
        cout << j << " ";  
    }  
    cout << "Blast off!!!" << endl;  
    return 0;  
}
```

# Recap: C++ Control Structures

- I/O: `cin >> ...; & cout << ...;`

- Definite loops:

```
for (i = 0; i < 10; i++)  
{  
    ...  
}
```

- Conditionals:

```
if (logical expression)  
{  
    ...  
}  
else  
{  
    ...  
}
```

- Indefinite loops:

```
//Another C++ program; Demonstrates loops  
#include <iostream>  
using namespace std;  
  
int main ()  
{  
    int i,j;  
    for (i = 0; i < 4; i++)  
    {  
        cout << "The world turned upside down...\n";  
    }  
  
    for (j = 10; j > 0; j--)  
    {  
        cout << j << " ";  
    }  
    cout << "Blast off!!" << endl;  
    return 0;  
}
```



# Recap: C++ Control Structures

- I/O: `cin >> ...; & cout << ...;`

- Definite loops:

```
for (i = 0; i < 10; i++)  
{  
    ...  
}
```

- Conditionals:

```
if (logical expression)  
{  
    ...  
}  
else  
{  
    ...  
}
```

- Indefinite loops:

```
while (logical expression)  
{  
    ...  
}
```

```
//Another C++ program; Demonstrates loops  
#include <iostream>  
using namespace std;  
  
int main ()  
{  
    int i,j;  
    for (i = 0; i < 4; i++)  
    {  
        cout << "The world turned upside down...\n";  
    }  
  
    for (j = 10; j > 0; j--)  
    {  
        cout << j << " ";  
    }  
    cout << "Blast off!!" << endl;  
    return 0;  
}
```

# Challenge: Definite Loops in Python & C++

- *Rewrite this program in C++:*

```
for i in range(2017, 2000, -2):  
    print("Year is", i)
```

- *Rewrite this program in Python:*

```
#include <iostream>  
using namespace std;  
int main()  
{  
    for (int i = 1; i < 50; i++)  
    {  
        cout << i << endl;  
    }  
    return 0;  
}
```

# Challenge: Definite Loops in Python & C++

- *Rewrite this program in C++:*

```
for i in range(2017, 2000, -2):  
    print("Year is", i)
```

# Challenge: Definite Loops in Python & C++

- *Rewrite this program in C++:*

```
for i in range(2017, 2000, -2):  
    print("Year is", i)
```

```
#include <iostream>  
using namespace std;
```

# Challenge: Definite Loops in Python & C++

- *Rewrite this program in C++:*

```
for i in range(2017, 2000, -2):  
    print("Year is", i)
```

```
#include <iostream>  
using namespace std;  
int main()
```

# Challenge: Definite Loops in Python & C++

- *Rewrite this program in C++:*

```
for i in range(2017, 2000, -2):  
    print("Year is", i)
```

```
#include <iostream>  
using namespace std;  
int main()  
{
```

# Challenge: Definite Loops in Python & C++

- *Rewrite this program in C++:*

```
for i in range(2017, 2000, -2):  
    print("Year is", i)
```

```
#include <iostream>  
using namespace std;  
int main()  
{  
    for (int i = 2017; i > 2000; i=i-2)
```

# Challenge: Definite Loops in Python & C++

- *Rewrite this program in C++:*

```
for i in range(2017, 2000, -2):  
    print("Year is", i)
```

```
#include <iostream>  
using namespace std;  
int main()  
{  
    for (int i = 2017; i > 2000; i=i-2)  
    {  
        cout << "Year is " << i << endl;  
    }  
}
```



# Challenge: Definite Loops in Python & C++

- *Rewrite this program in C++:*

```
for i in range(2017, 2000, -2):  
    print("Year is", i)
```

```
#include <iostream>  
using namespace std;  
int main()  
{  
    for (int i = 2017; i > 2000; i=i-2)  
    {  
        cout << "Year is " << i << endl;  
    }  
    return 0;  
}
```

# Challenge: Definite Loops in Python & C++

- *Rewrite this program in Python:*

```
#include <iostream>
using namespace std;
int main()
{
    for (int i = 1; i < 50; i++)
    {
        cout << i << endl;
    }
    return 0;
}
```

# Challenge: Definite Loops in Python & C++

- *Rewrite this program in Python:*

```
#include <iostream>
using namespace std;
int main()
{
    for (int i = 1; i < 50; i++)
    {
        cout << i << endl;
    }
    return 0;
}
```

```
for i in range(1, 50):
```

# Challenge: Definite Loops in Python & C++

- *Rewrite this program in Python:*

```
#include <iostream>
using namespace std;
int main()
{
    for (int i = 1; i < 50; i++)
    {
        cout << i << endl;
    }
    return 0;
}
```

```
for i in range(1, 50):
    print(i)
```

# Challenge: Conditionals in Python & C++

- *Python: what is the output?*

```
year = 2016
if year % 4 == 0 and \
    (not (year % 100 == 0) or (year % 400 == 0)):
    print("Leap!!")
print("Year")
```

- *Write a C++ program that asks the user the number of times they plan to ride transit this week. Your program should then print if it is cheaper to buy single ride metro cards or 7-day unlimited card.  
(The 7-day card is \$33.00, and the cost of single ride, with bonus, is \$2.75).*

# Challenge: Conditionals in Python & C++

- *Python: what is the output?*

```
year = 2016
if year % 4 == 0 and \
    (not (year % 100 == 0) or (year % 400 == 0)):
    print("Leap!!")
print("Year")
```

# Challenge: Conditionals in Python & C++

- *Python: what is the output?*

```
year = 2016
if year % 4 == 0 and \
    (not (year % 100 == 0) or (year % 400 == 0)):
    print("Leap!!")
print("Year")  year = 2016
```

```
if TRUE and \
    (not (year % 100 == 0) or (year % 400 == 0)):
    print("Leap!!")
print("Year")
```

# Challenge: Conditionals in Python & C++

- *Python: what is the output?*

```
year = 2016
if year % 4 == 0 and \
    (not (year % 100 == 0) or (year % 400 == 0)):
    print("Leap!!")
print("Year")
```



# Challenge: Conditionals in Python & C++

- *Python: what is the output?*

```
year = 2016
if year % 4 == 0 and \
    (not (year % 100 == 0) or (year % 400 == 0)):
    print("Leap!!")
print("Year")
```

```
year = 2016
if TRUE and \
    (not FALSE or (year % 400 == 0)):
    print("Leap!!")
print("Year")
```

# Challenge: Conditionals in Python & C++

- *Python: what is the output?*

```
year = 2016
if year % 4 == 0 and \
    (not (year % 100 == 0) or (year % 400 == 0)):
    print("Leap!!")
print("Year")
```

# Challenge: Conditionals in Python & C++

- *Python: what is the output?*

```
year = 2016
if year % 4 == 0 and \
    (not (year % 100 == 0) or (year % 400 == 0)):
    print("Leap!!")
print("Year")
```

```
year = 2016
if TRUE and \
    (TRUE or (year % 400 == 0)):
    print("Leap!!")
print("Year")
```

# Challenge: Conditionals in Python & C++

- *Python: what is the output?*

```
year = 2016
if year % 4 == 0 and \
    (not (year % 100 == 0) or (year % 400 == 0)):
    print("Leap!!")
print("Year")
```

# Challenge: Conditionals in Python & C++

- *Python: what is the output?*

```
year = 2016
if year % 4 == 0 and \
    (not (year % 100 == 0) or (year % 400 == 0)):
    print("Leap!!")
print("Year")
```

```
year = 2016
if TRUE and \
    (TRUE or FALSE):
    print("Leap!!")
print("Year")
```

# Challenge: Conditionals in Python & C++

- *Python: what is the output?*

```
year = 2016
if year % 4 == 0 and \
    (not (year % 100 == 0) or (year % 400 == 0)):
    print("Leap!!")
print("Year")
```

```
year = 2016
if TRUE and \
    (TRUE or FALSE):
    print("Leap!!")
print("Year")
```

# Challenge: Conditionals in Python & C++

- *Python: what is the output?*

```
year = 2016
if year % 4 == 0 and \
    (not (year % 100 == 0) or (year % 400 == 0)):
    print("Leap!!")
print("Year")
```

```
year = 2016
if TRUE and \
    (TRUE):
    print("Leap!!")
print("Year")
```

# Challenge: Conditionals in Python & C++

- *Python: what is the output?*

```
year = 2016
if year % 4 == 0 and \
    (not (year % 100 == 0) or (year % 400 == 0)):
    print("Leap!!")
print("Year")
```

```
year = 2016
if TRUE:
    print("Leap!!")
print("Year")
```



# Challenge: Conditionals in Python & C++

- *Python: what is the output?*

```
year = 2016
if year % 4 == 0 and \
    (not (year % 100 == 0) or (year % 400 == 0)):
    print("Leap!!")
print("Year")
```

```
year = 2016
if TRUE:
    print("Leap!!")
print("Year")
```

Prints: Leap!  
Year

# Challenge: Conditionals in Python & C++

- *Your program should then print if it is cheaper to buy single ride metro cards (\$2.75 per ride) or 7-day unlimited card (\$33.00).*

```
#include <iostream>  
using namespace std;
```

# Challenge: Conditionals in Python & C++

- *Your program should then print if it is cheaper to buy single ride metro cards (\$2.75 per ride) or 7-day unlimited card (\$33.00).*

```
#include <iostream>
using namespace std;
int main()
```

# Challenge: Conditionals in Python & C++

- *Your program should then print if it is cheaper to buy single ride metro cards (\$2.75 per ride) or 7-day unlimited card (\$33.00).*

```
#include <iostream>
using namespace std;
int main()
{
    int rides;
```

# Challenge: Conditionals in Python & C++

- *Your program should then print if it is cheaper to buy single ride metro cards (\$2.75 per ride) or 7-day unlimited card (\$33.00).*

```
#include <iostream>
using namespace std;
int main()
{
    int rides;
    cout << "Enter number of rides:";
```

# Challenge: Conditionals in Python & C++

- *Your program should then print if it is cheaper to buy single ride metro cards (\$2.75 per ride) or 7-day unlimited card (\$33.00).*

```
#include <iostream>
using namespace std;
int main()
{
    int rides;
    cout << "Enter number of rides:";
    cin >> rides;
```

# Challenge: Conditionals in Python & C++

- *Your program should then print if it is cheaper to buy single ride metro cards (\$2.75 per ride) or 7-day unlimited card (\$33.00).*

```
#include <iostream>
using namespace std;
int main()
{
    int rides;
    cout << "Enter number of rides:";
    cin >> rides;
    if (2.75 * rides < 33.00)
```

# Challenge: Conditionals in Python & C++

- *Your program should then print if it is cheaper to buy single ride metro cards (\$2.75 per ride) or 7-day unlimited card (\$33.00).*

```
#include <iostream>
using namespace std;
int main()
{
    int rides;
    cout << "Enter number of rides:";
    cin >> rides;
    if (2.75 * rides < 33.00)
    {
        cout << "Cheaper to buy single ride metro cards.\n";
    }
}
```



# Challenge: Conditionals in Python & C++

- *Your program should then print if it is cheaper to buy single ride metro cards (\$2.75 per ride) or 7-day unlimited card (\$33.00).*

```
#include <iostream>
using namespace std;
int main()
{
    int rides;
    cout << "Enter number of rides:";
    cin >> rides;
    if (2.75 * rides < 33.00)
    {
        cout << "Cheaper to buy single ride metro cards.\n";
    }
    else
```

## Challenge: Conditionals in Python & C++

- *Your program should then print if it is cheaper to buy single ride metro cards (\$2.75 per ride) or 7-day unlimited card (\$33.00).*

```
#include <iostream>
using namespace std;
int main()
{
    int rides;
    cout << "Enter number of rides:";
    cin >> rides;
    if (2.75 * rides < 33.00)
    {
        cout << "Cheaper to buy single ride metro cards.\n";
    }
    else
    {
        cout << "Cheaper to buy 7-day unlimited card.\n";
    }
}
```

## Challenge: Conditionals in Python & C++

- *Your program should then print if it is cheaper to buy single ride metro cards (\$2.75 per ride) or 7-day unlimited card (\$33.00).*

```
#include <iostream>
using namespace std;
int main()
{
    int rides;
    cout << "Enter number of rides:";
    cin >> rides;
    if (2.75 * rides < 33.00)
    {
        cout << "Cheaper to buy single ride metro cards.\n";
    }
    else
    {
        cout << "Cheaper to buy 7-day unlimited card.\n";
    }
    return 0;
}
```

# Challenge: Indefinite Loops in Python & C++

- Write Python code that repeatedly prompts for a non-empty string.
- Write C++ code that repeatedly prompts until an odd number is entered.

# Challenge: Indefinite Loops in Python & C++

- Write Python code that repeatedly prompts for a non-empty string.

# Challenge: Indefinite Loops in Python & C++

- Write Python code that repeatedly prompts for a non-empty string.

```
s = ""
```

# Challenge: Indefinite Loops in Python & C++

- Write Python code that repeatedly prompts for a non-empty string.

```
s = ""  
while s == "":
```

# Challenge: Indefinite Loops in Python & C++

- Write Python code that repeatedly prompts for a non-empty string.

```
s = ""  
while s == "":  
    s = input("Enter a non-empty string: ")
```



# Challenge: Indefinite Loops in Python & C++

- Write Python code that repeatedly prompts for a non-empty string.

```
s = ""  
while s == "":  
    s = input("Enter a non-empty string: ")  
print("You entered: ", s)
```

# Challenge: Indefinite Loops in Python & C++

- Write Python code that repeatedly prompts for a non-empty string.

```
s = ""
while s == "":
    s = input("Enter a non-empty string: ")
print("You entered: ", s)
```

- Write C++ code that repeatedly prompts until an odd number is entered.

# Challenge: Indefinite Loops in Python & C++

- Write Python code that repeatedly prompts for a non-empty string.

```
s = ""
while s == "":
    s = input("Enter a non-empty string: ")
print("You entered: ", s)
```

- Write C++ code that repeatedly prompts until an odd number is entered.

```
#include <iostream>
using namespace std;
```

# Challenge: Indefinite Loops in Python & C++

- Write Python code that repeatedly prompts for a non-empty string.

```
s = ""
while s == "":
    s = input("Enter a non-empty string: ")
print("You entered: ", s)
```

- Write C++ code that repeatedly prompts until an odd number is entered.

```
#include <iostream>
using namespace std;
int main()
```

# Challenge: Indefinite Loops in Python & C++

- Write Python code that repeatedly prompts for a non-empty string.

```
s = ""
while s == "":
    s = input("Enter a non-empty string: ")
print("You entered: ", s)
```

- Write C++ code that repeatedly prompts until an odd number is entered.

```
#include <iostream>
using namespace std;
int main()
{
    int num = 0;
```

# Challenge: Indefinite Loops in Python & C++

- Write Python code that repeatedly prompts for a non-empty string.

```
s = ""
while s == "":
    s = input("Enter a non-empty string: ")
print("You entered: ", s)
```

- Write C++ code that repeatedly prompts until an odd number is entered.

```
#include <iostream>
using namespace std;
int main()
{
    int num = 0;
    while (num % 2 == 0)
```

# Challenge: Indefinite Loops in Python & C++

- Write Python code that repeatedly prompts for a non-empty string.

```
s = ""
while s == "":
    s = input("Enter a non-empty string: ")
print("You entered: ", s)
```

- Write C++ code that repeatedly prompts until an odd number is entered.

```
#include <iostream>
using namespace std;
int main()
{
    int num = 0;
    while (num % 2 == 0)
    {
        cout << "Enter an odd number:";
```

# Challenge: Indefinite Loops in Python & C++

- Write Python code that repeatedly prompts for a non-empty string.

```
s = ""
while s == "":
    s = input("Enter a non-empty string: ")
print("You entered: ", s)
```

- Write C++ code that repeatedly prompts until an odd number is entered.

```
#include <iostream>
using namespace std;
int main()
{
    int num = 0;
    while (num % 2 == 0)
    {
        cout << "Enter an odd number:";
        cin >> num;
    }
}
```



# Challenge: Indefinite Loops in Python & C++

- Write Python code that repeatedly prompts for a non-empty string.

```
s = ""
while s == "":
    s = input("Enter a non-empty string: ")
print("You entered: ", s)
```

- Write C++ code that repeatedly prompts until an odd number is entered.

```
#include <iostream>
using namespace std;
int main()
{
    int num = 0;
    while (num % 2 == 0)
    {
        cout << "Enter an odd number:";
        cin >> num;
    }
}
```

# Challenge: Indefinite Loops in Python & C++

- Write Python code that repeatedly prompts for a non-empty string.

```
s = ""
while s == "":
    s = input("Enter a non-empty string: ")
print("You entered: ", s)
```

- Write C++ code that repeatedly prompts until an odd number is entered.

```
#include <iostream>
using namespace std;
int main()
{
    int num = 0;
    while (num % 2 == 0)
    {
        cout << "Enter an odd number:";
        cin >> num;
    }
    return 0;
}
```

# Weekly Reminders!



Before next lecture, don't forget to:

- Work on this week's Online Lab

# Weekly Reminders!



Before next lecture, don't forget to:

- Work on this week's Online Lab
- Schedule an appointment to take the Quiz in lab 1001E Hunter North

# Weekly Reminders!



Before next lecture, don't forget to:

- Work on this week's Online Lab
- Schedule an appointment to take the Quiz in lab 1001E Hunter North
- Submit this week's 5 programming assignments (**programs 57-60**)

# Weekly Reminders!



Before next lecture, don't forget to:

- Work on this week's Online Lab
- Schedule an appointment to take the Quiz in lab 1001E Hunter North
- Submit this week's 5 programming assignments (**programs 57-60**)
- If you need help, schedule an appointment for Tutoring in lab 1001E 11am-5pm

# Weekly Reminders!



Before next lecture, don't forget to:

- Work on this week's Online Lab
- Schedule an appointment to take the Quiz in lab 1001E Hunter North
- Submit this week's 5 programming assignments (**programs 57-60**)
- If you need help, schedule an appointment for Tutoring in lab 1001E 11am-5pm
- Take the Lecture Preview on Blackboard on Monday (or no later than 10am on Tuesday)

# Lecture Slips & Writing Boards



- Hand your lecture slip to a UTA.
- Return writing boards as you leave.