CSCI251/CSCI851 Autumn-2020
Advanced Programming (**LT9**)

Lecture Tutorial 9

From the Lab:

- When you have multiple inheritance with the same ancestor twice in the hierarchy of a class, you will run into the diamond problem.
  - `HoverCraft` is derived from `SeaTransport` and `LandTransport`, both of which are derived from `Transportation`.
- To deal with this, use Virtual inheritance.
  - When using **virtual inheritance**, the **virtual base class's constructor** is called directly by the most derived class's **constructor**.
    - So, the most derived class needs to directly call the base class.

- Overloading Student ++ …
- Why return *this?
  - See https://en.cppreference.com/w/cpp/language/operator_incdec.
  - For built-in prefix return references, postfix return values.
    - You could actually return whatever you like but we want consistency in the meaning.
- Postfix vs Prefix: ++X vs X++
  - Dummy variable on the operator for postfix…

```
Student& Student::operator++()
{
  ++year;
  return *this;
}
```

```
Student& operator++();
Student& operator++(int);
```

```
Student& Student::operator++(int dummy)
{
      year++;
      return *this;
}
```

```
Student& Student::operator++()
{
      ++year;
      return *this;
}
```

```
Student& operator++();
Student operator++(int);
```

```
Student Student::operator++(int dummy)
{
      Student temp(stuID,year,WAM);
      ++(*this);
      return temp;
}
```

The dummy variables has a default of 0. Change → `a.operator++(2)`

The Three Little Software Engineers

- Really the three little pigs…
- Why the timeline?
  - Remember the idea of `main()` telling a story?
  - Well here it literally does and you might see a sequence of calls in `main()` that reflects the timeline you generate.

- Probably one of the more significant problems I saw was people having 3 pig classes, or 3 house classes.
- The 4 pigs aren't the same, but they have the same attributes just with different values.
  - While they don't do exactly the same things they could if they were smart enough to do so, or were following instructions.
- Similarly with the houses, they differ in materials and resulting strength.
  - Those can be represented by different attribute values.
  - The success of the attempt of the wolf to blow the house in would be determined by comparing the house strength and the "wolf puff strength".