OOP244 Quiz 6 ***July 11, 2017*** **Name/Student # _____**
Functions in a Hierarchy

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

class Parent
{
public:
    void display() { cout << "Parent"; }
};

class Child : public Parent
{
public:
    void display() { cout << "Child"; }
};

int main()
{
    Parent p;
    Child c;

    c.display();
}
```

Answer 1 out of 2 below.

Q1. Which display function gets called? Parent::display, or Child::display?
Q2. What is the output?

Now we extend the classes to print names.

```
class Parent
{
   const char *name;
public:
    Parent(const char* p)
    {
        name = p;
    }
    void display() { cout << "Parent " << name; }
};

class Child : public Parent
{
    const char* name;
public:
    Child(const char* pName, const char* cName) : Parent(pName) {
        name = cName;
    };
    void display() {
            cout << "Child " << name << " of ";
            Parent::display();
        }
};


int main()
{
    Child c("Trudeau", "Justin");
```

```
    c.display();
    cout << endl;
}
```

Answer any 1 out of 4
Q1. If I create the Parent object how many constructors are called?
Q2. If I create the Child object how many constructors are called?
Q3. Which constructor is called first, Parent or Child? (Hint: can a child be born before it's parent?)
Q4. In the example above, do I need a destructor for Parent or Child?

Virtual functions

I now want to write a global helper function to handle both Parent and child.

```
// use Parent and Child from previous example...

void hello(Parent *X)
{
    cout << "Hello to ";
    X->display();
    cout << endl;
}

int main()
{
    Parent p("Trudeau");
    Child c("Trudeau", "Justin");

    hello(&p);
    hello(&c);
}
```

Answer any 1 out of 4.

Q1. What is the output?
Q2. How can I make it print out Justin's name? (Hint: copying hello and overloading it to take a Child* is NOT a good solution! There is a way to do it by typing in only 1 word.)
Q3. What happens if I make Parent::display virtual?
Q4. Do I need to declare Child::display as virtual too? What happens if I do?