CSCI 2380 Midterm Sample Problems

These problems are similar to some of the questions on the midterm. They are not comprehensive - the midterm contains questions on other topics (including memory allocation, file input/output, and dynamic array-based data structures).

Problem 1. What does the following program print? Draw a box around your solution.

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

int main()
{
    int x1 = 3;
    int x2 = 10;
    int* y1;
    int* y2;
    int** z;

    y1 = &x1;
y2 = &x2;
z = &y1;

    cout << *y1 << " " << *y2 << " " << **z << endl;
x1 += 1;

    cout << x1 << " " << *y1 << " " << *y2 << " " << **z << endl;
*y2 += 4;

    cout << x1 << " " << x2 << " " << *y2 << endl;
**z += 1;

    cout << x1 << " " << x2 << " " << *y1 << " " << **z << endl;
z = y2;

    cout << x1 << " " << x2 << " " << *y2 << " " << **z << endl;
*z = &x1;

    cout << x1 << " " << *y1 << " " << *y2 << " " << **z << endl;
x1 += 1;
}
```
Problem 2. Assume that the Queue and Stack classes in the following code behave as typical queues and stacks of ints. What does the following program print? Draw a box around your solution.

```cpp
#include <iostream>
#include "queue.h"
#include "stack.h"

using namespace std;

int main()
{
    Queue q;
    for (int i = 1; i <= 3; ++i)
        q.push(i);

    while (q.front() != 3)
    {
        q.push(q.front());
        q.push(q.front());
        q.pop();
    }

    Stack s;
    while (q.size() > 0)
    {
        s.push(q.front());
        q.pop();
    }
    while (s.size() > 0)
    {
        cout << s.top() << endl;
        s.pop();
    }
}
```
Problem 3. Declare a class named Pokemon with the following methods and instance variables:

- A (public) constructor with two int parameters and a string parameter.
- A public method named level_up with no parameters that returns nothing.
- A public method named summary with no parameters that returns a string.
- A public method named gain_experience with an int parameter that returns nothing. info with no parameters that returns a string.
- A private int variable named combat_points.
- A private int variable named level.
- A private string variable named name.