CS 31: Midterm 1 Review -- 10/19/2015

- Libraries
  - #include <library>
  - #include <iostream>
    #include <string>
    #include <cctype>
  - iostream → input/output stream
- Namespaces:
  - a namespace is a collection of classes and functions
  - using namespace std;
- Modifying variables
  - Integer division truncates after decimal point
  - Use double
- Strings
  - used to store blocks of text
  - strings can be initialized through literals
    - string s = “hello”
  - individual characters called by s[x]

```
string s = "Hello";
for (int k = 0; k != s.size(); k++)
        cout << s[k] << endl;
```

- cctype
  - #include <cctype>
  - Returns true/false for certain conditions
  - isalpha(x), isdigit(x), islower(x), ispunct(x), isspace(x), isupper(x), tolower(x), toupper(x)
- Ignoring characters
  - cin.ignore (in numChars, char delim)
  - cin.ignore(10000, ‘\n’);
  - Put after entering (cin) a number (int or double) and before entering a string (getline(cin, xyz))
- if, else if, else statements
  - if (cond.)
    { // stuff
    }
    else if (cond.)
    { // stuff
    }
    else
    { // stuff
    }
- switch statements
  - switch(expression)
    {
    case constant expression:
      //stuff
      break; //optional
    case x:
      //stuff
      break;
    default: //optional
      //stuff
    }

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

int main () {
    const int N = 2;
    int rows = (N + 1) / 2;

    // We'll need to ensure that we have an
    // odd number of blocks when our N is odd
    bool isOdd = (N % 2) == 1;

    // Print row-by-row
    for (int i = 0; i < rows; i++) {
        // Begin by printing left-most spaces
        for (int j = 0; j < rows - i - 1; j++) {
            cout << " ";
        }

        // Then print out the number of blocks
        for (int k = 0; k < 2 * (i + 1) - isOdd; k++) {
            cout << "X";
        }
        cout << endl;
    }
}
```

- while loops
  - while:
    while(cond.)
    { // stuff
    }
  - do-while:
    do
    { //stuff
    } while (cond.);
- for loops
  - for(init;condition;increment)
    { // stuff
    }

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

int main () {
  string racecar = "racecar";
  int length = racecar.size();

  // I affectionately deem this the "echo" loop
  for (int i = 0; i < length; i++) {
      for (int j = i; j < length; j++) {
          cout << racecar[j];
      }
      cout << endl;
  }
}
```

- Don't forget to put ; and what happens when there are negative numbers or zero
- Show how many decimal places: cout.setf(ios::fixed);
  cout.precision(2);

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

int main()
{
    int side;

    cout << "Enter a number: ";
    cin >> side;

    for (int i = 0; i < side; i++)
    {
        for (int j = i; j >= 0; j--)
        {
            cout << "#";
        }
        cout << "\n";
    }
}
```

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

int main() {
  int score = 0;

  cout << "Please enter the student's score:";
  cin >> score;

  int choice = score/10;

  switch(choice) {
    case 10:
    case 9:
      cout << "A" << endl;
      break;
    case 8:
      cout << "B" << endl;
      break;
    case 7:
      cout << "C" << endl;
      break;
    case 6:
      cout << "D" << endl;
      break;
    default:
      cout << "F" << endl;
  }
}
```

3.
```
#include <iostream>
using namespace std;

int main()
{
    int side;

    cout << "Enter a number: ";
    cin >> side;

    for (int i = 0; i < side; i++)
    {
        int j = i;
        while (j >= 0)
        {
            cout << '#';
            j--;
        }
        cout << "\n";
    }
}
```

4.
```
#include <iostream>
using namespace std;

int main()
{
    int side;

    cout << "Enter a number: ";
    cin >> side;

    if (side > 0)
    {
        int i = 0;
        do
        {
            int j = i;
            while (j >= 0)
            {
                cout << '#';
                j--;
            }
            cout << "\n";
            i++;
        } while (i < side);
    }
}
```