

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

- while loops

- while:  
while(cond.)  
{ // stuff  
}
- do-while:  
do  
{ //stuff  
} while (cond.);

- for loops

- for(initial;condition;increment)  
{ // stuff  
}

- 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 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;
}
}
```

```
#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;
    }
}
```

```
#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;
    }
}
```

```
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);
    }
}
```