Engineering 101
Dr. Mark Brehob

Welcome

• Me:
  – Lecturer in EECS, mainly focused on Computer Architecture
  – In the last 5 years I've taught:
    • 203, 270, 281, 370, 373, 470
  – Computer Engineering Advisor
  – PhD from MSU
  – GSI for a few years for a programming class of over 1000 students a semester (at MSU)

GSIs

Class

• Introduction to programming in C++ and MATLAB
  – First 2 weeks are about learning basics of C++
    • Will focus on reading and understanding code, not writing it during this time.
  – Next 3 weeks are about good programming practices
    • Some syntax
  – After that we have an exam and start focusing on the design of programs.

<table>
<thead>
<tr>
<th>#</th>
<th>What</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Exams</td>
<td>15/15/20 (50%)</td>
</tr>
<tr>
<td>~7</td>
<td>Programming assignments</td>
<td>27%</td>
</tr>
<tr>
<td>2</td>
<td>“Practicals”</td>
<td>8%</td>
</tr>
<tr>
<td>~13</td>
<td>In-lab assignments*</td>
<td>6%</td>
</tr>
<tr>
<td>5</td>
<td>Homework assignments*</td>
<td>5%</td>
</tr>
<tr>
<td>2</td>
<td>Quizzes</td>
<td>4%</td>
</tr>
</tbody>
</table>

Grades are on a curve. Median grade is expected to be a high B-

* Drop lowest 2 in-labs and lowest homework.

See webpage for late policies etc.

Exams

• In the evening
  – Feb 10 (Thursday)
  – March 30 (Wednesday)
• Open book
• 1 page of notes
• Expecting ½ multi-choice, ½ coding
Quizzes

- 20 minutes
- In class
- Closed books/notes

Expected work

- Workload for you
  - 3.0 class
  - 2.0 lab
  - 1.5 reading/office hours/practice
  - 0.5 additional in-lab work.
  - 0.5 homework (5@2 hours)
  - 1.5 projects 0.1.2.3 (4@5 hours)
  - 3.0 projects A.B.C (3@15 hours)
  - 1.0 practicals (2@6 hours)
  - 1.0 cram/studying for exams (3@5 hours)
- ~14 hours/week

Evaluating assignments

- It really is just like normal math
  - Do things in ()
  - Do * and / from left to right
  - Do + and – from left to right
- Big thing is that at each step if both “arguments” are ints, so is result
Doubles

• At each step, if either argument is a double, so is the result.

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

main(int argc, char * argv[])
{
    double a, b, c, d;
    a=5;
    b=10;
    c=a/b;
    d=b/a;
    cout << "c = " << c << endl;
    cout << "d = " << d << endl;

    c=2*5/2;
    d=4/2;
    cout << "c = " << c << endl;
    cout << "d = " << d << endl;

    c=2+4/6;
    d=4/-5+1;
    cout << "c = " << c << endl;
    cout << "d = " << d << endl;
}
```

Done for today

• What you learned
  – Assignments
    • Order of evaluation
  – int and double
  – if/else statements

• Next up:
  – In lab assigned this week in lab.
  – HW1 due date on Thursday by noon

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

main(int argc, char * argv[])
{
    int a, b, c, d;
    a=0.5;
    b=2.0;
    c=2/3+a/b;
    d=b/3;
    cout << "c = " << c << endl;
    cout << "d = " << d << endl;
}
```

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

main(int argc, char * argv[])
{
    int a, b, c, d;
    a=10;
    b=1;
    c=a+b+9;
    if(c>8)
    d=15;
    else
    d=a+c;
    cout << "c = " << c << endl;
    cout << "d = " << d << endl;
}
```