Engineering 101

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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.

Grades

#	What	Value
3	Exams	15/15/20 (50%)
~7	Programming assignments	27%
2	"Practicals"	8%
~13	In-lab assignments*	6%
5	Homework assignments*	5%
2	Quizzes	4%

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

Quizes

- 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

ex1.cc

```
using namespace std;
#include<iostream>
main(int argc, char * argv[])
{
    cout << "Hello World" << endl;
}
```

ex2.cc

```
#include<iostream>
using namespace std;
main(int argc, char * argv[])
{
    int a, b, c, d;

    a=10;
    b=1;
    c=a+b+9;
    d=a+c;
    cout << "c= " << c << endl;
    cout << "d= " << d << endl;
}
```

exm.cc

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
- A=4/3+16*3/4+16*(3/4)
- A=-4/3+16*3/4+16*(3/4)

ex2b.cc

```
#include<iostream>
using namespace std;
main(int argc, char * argv[])
{
    int a, b, c, d;

    a=5;
    b=10;
    c=a/b;
    d=b/a;

    cout << "c= " << c << endl;
    cout << "d= " << d << endl;

    c=4*5/2;
    d=4*(5/2);

    cout << "c= " << c << endl;
    cout << "d= " << d << endl;
```

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

Doubles

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

ex2c.cc

```
#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=4*5/2;
    d=4*(5/2);

    cout << "c= " << c << endl;
    cout << "d= " << d << endl;

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

ex2d.cc

```
#include<iostream>
using namespace std;
main(int argc, char * argv[])
{
    double 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;
}
```

ex3.cc

```
#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;

}
```

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*