EECS2030 Fall 2018 **Name: (Last, First)** _____
Advanced OOP
Lab Test 3 Preparation Exercise
Time Limit: 80 minutes **Student ID** _____

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1 Programming Exercises

- Download and import this starter project.
- This exercise is based on the Student Management System example discussed in the lectures on inheritance.

2 Written Exercises

These examples questions only cover up to Slide 63 of the inheritance lecture. Similar questions will be covered for later slides of the lecture.

1. Consider the following classes, where we use `print` to abbreviate `System.out.println`:

```
class A extends B {
  A() { }
}
```

```
class B extends C {
  B() { }
}
```

```
class C {
  C() { }
  void bm(){print("C.bm");}
}
```

```
class D extends C {
  D() { }
  void cm(){print("D.cm");}
}
```

```
class F extends D {
  F() { }
  void bm(){print("F.bm");}
  void em(){print("F.em");}
}
```

```
class E extends F {
  E() { }
  void dm(){print("E.dm");}
}
```

Now consider the following code in the `main` method of a tester class for the above classes:

```
1 D d1 = new C();
2 C d2 = new D();
3 d2.bm();
4 D e1 = new E();
5 d2 = e1;
6 d2.bm();
7 F f = e1;
8 e1.em();
```

(a) Explain if **Line 1** compiles.

(b) Explain if **Line 2** compiles.

(c) Explain if **Line 3** compiles. If yes, write down and explain how the output is printed.

(d) Explain if **Line 5** compiles. If yes, what are the static type and dynamic type of `d2` after `Line 5` is executed?

(e) Explain if **Line 6** compiles. If yes, write down and explain the output.

(f) Explain if **Line 7** compiles.

(g) Explain if **Line 8** compiles. If yes, write down and explain the output. If no, suggest a fix using type casting, then write down and explain how the output is printed.