# CSCI2600 Quiz 5

Aaron Taylor

TOTAL POINTS

## 6 / 10

QUESTION 1

## 1 Question 1 6 / 10

- **0** Correct
- **1** Q.1 sub question 1
- **1** Q.1 sub question 2
- **1 Q.1 sub question 3**
- **1 Q.1 sub question 4**
- **1** Q.1 sub question 5
- **1 Q.1 sub question 6**
- **1** Q.1 sub question 7
- **1** Q.1 sub question 8
- **1** Q.1 sub question 9
- **1 Q.2**

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# Principles of Software Quiz 5
## March 23, 2017
### 10 points total

**Question 1.** (9pts) Consider this `Duration` class similar to the one we saw in lecture:

```java
class Duration {
        private final int min;
        private final int sec;
        public Duration(int min, int sec) {
                this.min = min;
                this.sec = sec;
        }
        public boolean equals(Object o) {
                if (! (o instanceof Duration) )  return false;
                Duration d = (Duration) o;
                return this.min == d.min && this.sec == d.sec;
        }
}


class NanoDuration extends Duration {
        private final int nano;
        public NanoDuration(int min,
                            int sec,
                            int nano){
            super(min,sec);// initializes min&sec
            this.nano = nano;
        }
        public boolean equals(Object o) {
                if (! (o instanceof Duration) )  return false;
                if (! (o instanceof NanoDuration) ) return super.equals(o);
                NanoDuration nd = (NanoDuration) o;
                return super.equals(nd) && nd.nano == nano;
        }
}


public class TestDuration2 {
        public static void main(String[] args) {
                Duration d1 = new NanoDuration(5,10,15);
                Duration d2 = new Duration(5,10);
                Duration d3 = new NanoDuration(5,10,30);
                System.out.println(d1.equals(d2));  true
                System.out.println(d2.equals(d3));  false
                System.out.println(d1.equals(d3));  true
        }
}
```

What is printed by the code above?  true
true
true

What are the compile time types of d1, d2, and d3?   d1 = NanoDuration
d2 = Duration
d3 = NanoDuration

What are the runtime types of d1, d2 and d3?   d1 = NanoDuration
d2 = Duration
d3 = NanoDuration

**Question 2.** (1pt) `Integer f(String)` is a function subtype of `Number f(Object)`. Note: `Integer` is a subtype of `Number`.

(a) true
(b) false