Questions | Reading 2: Code Review | 6.005.1x Courseware

Questions

fail fast

5/6 points (graded)

```
public static int dayOfYear(int month, int dayOfMonth, int year) {
    if (month == 2) {
        dayOfMonth += 31;
    } else if (month == 3) {
        dayOfMonth += 59;
    } else if (month == 4) {
        dayOfMonth += 90;
    } else if (month == 5) {
        dayOfMonth += 31 + 28 + 31 + 30;
    } else if (month == 6) {
        dayOfMonth += 31 + 28 + 31 + 30 + 31;
    } else if (month == 7) {
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30;
    } else if (month == 8) {
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31;
    } else if (month == 9) {
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31;
    } else if (month == 10) {
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30;
    } else if (month == 11) {
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30 + 31;
    } else if (month == 12) {
        dayOfMonth += 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30 + 31 + 31;
    }
    return dayOfMonth;
}
```

Suppose the date is January 3, 2019. The correct dayOfYear for this date is 3, since it's the third day of the year.

Which of the following are plausible ways that a programmer might (mistakenly) call dayOfYear? And for each one, does it lead to a static error, dynamic error, or wrong answer?

```
dayOfYear(1, 3, 2019)
```

correct

not a mistake -- right answer

Explanation

dayOfYear() expects its arguments in month/day/year order, with the month as a number from 1 to 12, so this is the right way to call it, and it will produce the right answer, 3.

```
dayOfYear(0, 3, 2019)
```

correct

plausible mistake -- right answer

Explanation

This is plausible if the programmer is assuming zero-based indexing for months, i.e. the month is a number from 0 to 11. Zero-based indexing is far more common in programming than one-based indexing, so this is a very plausible mistake. Luckily, in this case, month=0 behaves the same as month=1 (trace through the code to see why), so the right answer is still returned.

```
dayOfYear(3, 1, 2019)
```

correct

plausible mistake -- wrong answer

Explanation

This is plausible if the programmer is assuming the arguments are in day/month/year order, which is the standard almost everywhere in the world except the United States. It quietly produces the wrong answer because dayOfYear() interprets those arguments as March 1.

```
dayOfYear("January", 3, 2019)
```

correct

plausible mistake -- static error

Explanation

This is plausible if the programmer is assuming the month is passed by a string name (in English). Static type checking forbids passing a String to an int argument, however, so the mistake is caught fast, before the program even starts.

```
dayOfYear(2019, 1, 3)
```

correct

plausible mistake -- wrong answer

Explanation

This is plausible if the programmer is assuming the arguments are in year/month/day order, which is a common international standard (ISO 8601, in fact). It quietly produces the wrong answer because none of the if statements match the huge month number, so it ends up treating it the same as January, but 1 was passed for dayOfMonth, so it returns the answer for January 1.

```
dayOfYear(1, 2019, 3)
```

unsubmitted

implausible mistake

Explanation

This is implausible because no convention for writing dates puts the year in the middle. That's just silly, like putting the month at the beginning.

Some problems have options such as save, reset, hints, or show answer. These options follow the Submit button.

fail fast, part 2

5/5 points (graded)

Which of the following changes (considered separately) would make the code fail faster if it were called with arguments in the wrong order?

```
public static int dayOfYear(String month, int dayOfMonth, int year) {
  ...
}
```

correct

```
public static int dayOfYear(int month, int dayOfMonth, int year) {
  if (month < 1 || month > 12) {
    return -1;
  }
  ...
}
```

correct

```
public static int dayOfYear(int month, int dayOfMonth, int year) {
  if (month < 1 || month > 12) {
    throw new IllegalArgumentException();
  }
  ...
}
```

correct

```
public enum Month { JANUARY, FEBRUARY, MARCH, ..., DECEMBER };
public static int dayOfYear(Month month, int dayOfMonth, int year) {
  ...
}
```

correct

```
public static int dayOfYear(int month, int dayOfMonth, int year) {
  if (month == 1) {
    ...
  } else if (month == 2) {
    ...
  }
  ...
  } else if (month == 12) {
    ...
  } else {
    throw new IllegalArgumentException("month out of range");
  }
}
```

correct

Some problems have options such as save, reset, hints, or show answer. These options follow the Submit button.

Correct (5/5 points)

Question 1: correct

Question 2: correct

Question 3: correct

Question 4: correct

Question 5: correct