

- method has 4 parameters (double, double, boolean, int)
- method returns a double!

3. Debugging

Consider a static method called **dosageDays** that computes and returns the days' worth of medication dosages possible in a prescription given the total amount prescribed, the dosage amount, the patient's age, and dosage frequency:

- **double totalRx** - the amount of medication units prescribed to a patient
(guaranteed to be at least 0.0)
- **double dosageAmt** - the measured amount of one single dosage of medication in units, assuming the patient is an adult.
(guaranteed to be less than or equal to the totalRx) ✓ look for if statement and /2!
- **boolean isAdult** - whether the patient is an adult or not. If the patient is not an adult, the actual dosage amount (i.e. defined by dosageAmount) should be further divided by two.
- **int dosageFreq** - the amount of times the prescribed medication dosage should be taken in one day.
(guaranteed to be at least 1)

With this information, the method **dosageDays** will **print and return** the number of days' worth of medication the prescription gives a patient.

For example, suppose the following call was made:

```
double days = dosageDays(200, 20, true, 2);
```

← return type hint

This call to a correct implementation of the method might produce output like the following:

```
Prescription: 200.0 unit(s)
Adult Patient?: Yes
Adjusted Dosage Amount: 20.0 unit(s)
Dosage Frequency: 2 time(s) per day
==> Dosage Days: 5.0
```

$$200.0 / 20.0 / 2 = 10.0 / 2 = 5.0$$

Plus, days will have the value of 5.0.

Another similar correct call might be the following:

```
double days = dosageDays(100, 10, false, 2);
```

This call to a correct implementation of the method might produce output like the following:

```
Prescription: 100.0 unit(s)
Adult Patient?: No
Adjusted Dosage Amount: 5.0 unit(s)
Dosage Frequency: 2 time(s) per day
==> Dosage Days: 10.0
```

Plus, days will have the value of 10.0.

typo! should be "double"

Consider the following proposed buggy implementation of `dosageDays`:

```
1 public static double dosageDays(int totalRx, int dosageAmt,
2                                 boolean isAdult, int frequency) {
3     String adultString = "maybe";
4     if(isAdult.equals("true")) {
5         adultString = "Yes";
6     } else {
7         adultString = "No";
8     }
9     System.out.println("Prescription: " + totalRx + " unit(s)");
10    System.out.println("Adult Patient?: " + adultString);
11    System.out.println("Adjusted Dosage Amount: " + dosageAmt + " unit(s)");
12    System.out.println("Dosage Frequency: " + frequency + "time(s) per day");
13    System.out.print("==> ");
14    System.out.println("Dosage Days: " + totalRx / dosageAmt / frequency);
15 }
```

This implementation contains three bugs that are causing it to not work as intended!

Your task: Annotate (write on) the code below to indicate how you would fix the three bugs. You may **add** (using arrows to indicate where to insert), **remove** (by crossing out), or **modify** (with a combination) any code you choose. However, the fix should not require a lot of work.

You must correctly identify three of the lines with issues, or correctly identify and fix two of the bugs for an S grade.

You must correctly identify all three lines with the bugs **and** correctly fix all three of the bugs for an E grade.

```
1 public static double dosageDays(double totalRx, double dosageAmt,
2                                 boolean isAdult, int frequency) {
3     String adultString = "maybe";
4     if(isAdult.equals("true")) { // Bug #1 - wrong .equals usage
5         adultString = "Yes";
6     } else {
7         adultString = "No";
8     } // dosageAmt != 2; // - Bug #2 - think of the children!
9     System.out.println("Prescription: " + totalRx + " unit(s)");
10    System.out.println("Adult Patient?: " + adultString);
11    System.out.println("Adjusted Dosage Amount: " + dosageAmt + " unit(s)");
12    System.out.println("Dosage Frequency: " + frequency + " time(s) per day");
13    System.out.print("==> ");
14    System.out.println("Dosage Days: " + totalRx / dosageAmt / frequency);
15 } // return totalRx / dosageAmt / frequency; // Bug #3 (or 0) - missing return
```

Overall gameplan

Steps

- ① read spec!
 - ↳ look for general behavior
 - ↳ highlight key items
- ② check for compiler errors
 - ↳ method header (parameters, return)
 - ↳ "obvious" incorrect types, methods, ...
- ③ trace through examples, compare output and returns

for this problem...

- for child, halve dosage
- math to calculate dosage days
- 4 parameters, return double

- method doesn't return anything! (bug 0)

- invalid "isEquals()"

- doesn't divide by 2 for children