Option 2

**Debugging**

**Bugs:**

1. **Constructor Validation message**:

**Issue**: The error message in the constructor is incorrect. It should be “Negative values not permitted”. Currently it is “Non-negative values not permitted” which is misleading.

**Fix**: Update the error message to correctly reflect the validation logic.

1. **addHour method**:

**Issue**: This method does not correctly handle the wrap around. Consider, hours = 23:00:00 and we want to addHour(), ideally it should be 00:00:00 but it will give 24:00:00 because it goes into else condition and makes hours++ currently.

**Fix**: Change the if condition to hours == 23 so that hours will become 0 instead of 24.

1. **addMinute method:**

**Issue**: The addMinute method does the implementation of addSecond which is also wrong that we will cover in next bug.

**Fix**: Implement the addMinute method that when minutes == 59 then minutes = 0 and addHour() otherwise, do minutes++

1. **addSecond method:**

**Issue**: The addSecond method should increment seconds and wrap-around when seconds == 59 and not >=60. Consider, 12:10:59 and addSecond(), then in current implementation it will give 12:10:60 which is wrong. It should give 12:11:00.

**Fix**: Change the if condition from >= 60 to == 59.

1. **get12HourFormat method:**

**Issue**: getSuffix was called at last when the hours format was changed to 12 Hour format. So, if we had 23:00:00 then it converts hour to 11 and then it calls suffix function so it returned

“AM” always.

**Fix**: To handle this, I called the getSuffix function before the hours conversion

to 12 Hour format.

1. **Pad function:**

**Issue**: It had a condition of value < 9 so it works from 0 to 8 only but we also

want 9 to pad to 09.

**Fix**: So I modified the condition to value <= 9

**Covers 100% of all the code lines in Clock.java**

