



OOPT Stage 2050 & 2060 - Contract, Test

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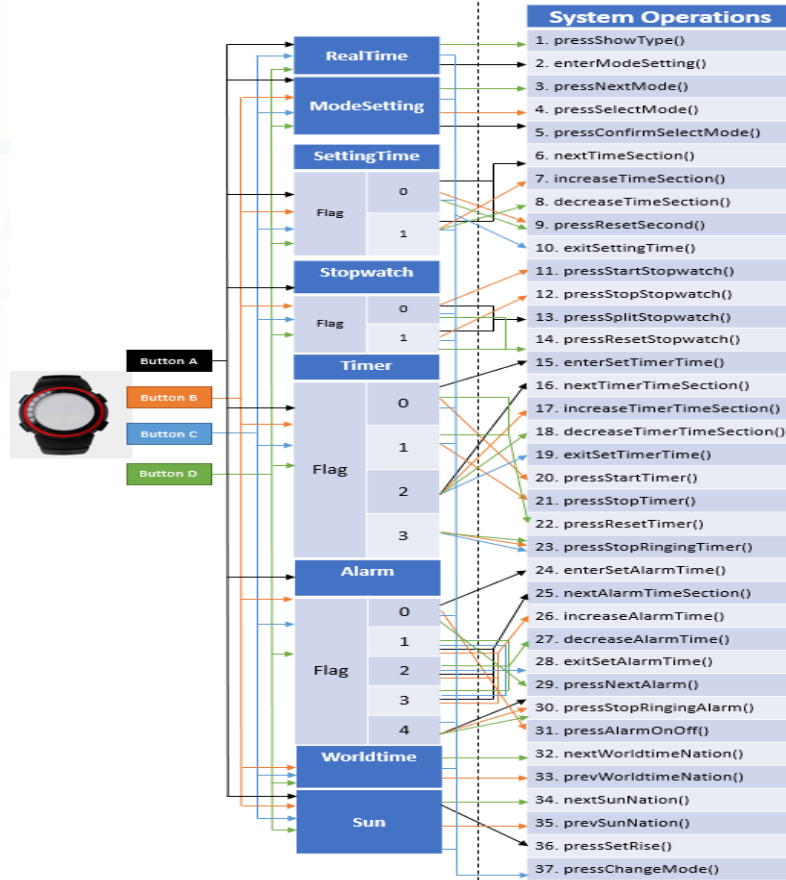
2051. Implement Class & Method Definition

Type ↴	Class ↴
Name ↴	<u>ModeDB</u> ↴
Purpose ↴	시계의 정보들이 저장되는 Database ↴
<u>Overview(Class)</u> ↴	시계에서 기능이 삭제될 경우 기능에 대한 정보가 저장되고 ↴ 시계에서 기능이 생길 경우 기능에 대한 정보를 가져올 수 있는 클래스이다. ↴
Cross Reference ↴	Functions: R2.3, R2.4 ↴
Exceptional Courses of Events ↴	↴

↴

Type ↴	Class ↴
Name ↴	Bell ↴
Purpose ↴	Timer와 Alarm에서의 기능에 대한 Bell을 재생하거나 정지시키는 Class이다. ↴
<u>Overview(Class)</u> ↴	Timer와 Alarm에서의 기능에 대한 Bell을 재생하거나 정지시키는 Class이다. ↴
Cross Reference ↴	Functions: R5.6, R5.7, R6.4, R6.6, R6.7 ↴
Exceptional Courses of Events ↴	N/A ↴

2052. Implements Windows



2055. Write Unit Test

```
@Test
public void requestIncreaseTimerTimeSection() {
    Timer timer = new Timer();

    // 1: Max Second Increase Test
    timer.getRsvTime().set(Calendar.SECOND, 59);

    timer.requestIncreaseTimerTimeSection(); // 59 -> 0
    timer.requestIncreaseTimerTimeSection(); // 0 -> 1

    assertEquals(0, timer.getRsvTime().get(Calendar.MILLISECOND));
    assertEquals(1, timer.getRsvTime().get(Calendar.SECOND));
    assertEquals(0, timer.getRsvTime().get(Calendar.MINUTE));

    // 2: Max Minute Increase Test
    timer.setCurrSection(1);
    timer.getRsvTime().set(Calendar.MINUTE, 59);

    timer.requestIncreaseTimerTimeSection(); // 59 -> 0
    timer.requestIncreaseTimerTimeSection(); // 0 -> 1

    assertEquals(1, timer.getRsvTime().get(Calendar.SECOND));
    assertEquals(1, timer.getRsvTime().get(Calendar.MINUTE));
    assertEquals(0, timer.getRsvTime().get(Calendar.HOUR_OF_DAY));

    // 3: Max Minute Increase Test
    timer.setCurrSection(2);
    timer.getRsvTime().set(Calendar.HOUR_OF_DAY, 23);

    timer.requestIncreaseTimerTimeSection(); // 23 -> 24(0)
    timer.requestIncreaseTimerTimeSection(); // 0 -> 1

    assertEquals(1, timer.getRsvTime().get(Calendar.SECOND));
    assertEquals(1, timer.getRsvTime().get(Calendar.MINUTE));
    assertEquals(1, timer.getRsvTime().get(Calendar.HOUR_OF_DAY));
    assertEquals(1, timer.getRsvTime().get(Calendar.DATE));
}
```

3-2 requestIncreaseTimerTimeSection

해당 함수를 실행시켰을 때 값이 증가하는 지, 해당 section에서 가장 큰 수일 때 실행시키면, 다음 section이 증가하고 해당 section이 가장 작은 수가 되는지 확인

2055. Write Unit Test

```
public class SunTest {  
  
    @Test  
    public void realTimeTaskSun() {  
        RealTime realTime = new RealTime();  
        realTime.requestRealTime().set(2019, 5, 23, 03, 59, 30);  
        Sun sun = new Sun(realTime);  
  
        // Before realTimeTaskSun  
        assertEquals(23, sun.getSun(0).get(Calendar.DATE)); // Today(23)'s Sun Rise  
        assertEquals(23, sun.getSun(1).get(Calendar.DATE)); // Today(23)'s Sun Set  
  
        realTime.requestRealTime().set(2019, 5, 23, 12, 59, 30);  
        sun.realTimeTaskSun(); // [Changed] this.currTime.getTimeInMillis() >= this.sun[0].getTimeInMillis()  
        assertEquals(24, sun.getSun(0).get(Calendar.DATE)); // Tomorrow(23->24)'s Sun Rise  
        assertEquals(23, sun.getSun(1).get(Calendar.DATE)); // Today(23)'s Sun Set  
  
        realTime.requestRealTime().set(2019, 5, 23, 20, 59, 30);  
        sun.realTimeTaskSun(); // [Changed] this.currTime.getTimeInMillis() >= this.sun[1].getTimeInMillis()  
        assertEquals(24, sun.getSun(0).get(Calendar.DATE)); // Tomorrow(24)'s Sun Rise  
        assertEquals(24, sun.getSun(1).get(Calendar.DATE)); // Tomorrow(23 -> 24)'s Sun Set  
    }  
}
```

6-1 realTimeTaskSun

시간이 해당 날의 일출, 일몰을 넘어갔을 경우, 그 다음 날의 일출, 일몰을 보여주는지 확인

2055. Write Unit Test

```
@Test
public void confirmSelectMode() throws UnsupportedOperationException, IOException, LineUnavailableException {
    WatchSystem sys = new WatchSystem();
    ModeSetting ms = (ModeSetting)sys.getMenu(0);
    sys.enterModeSetting();
    //ms.requestModeSetting();

    assertThat(ms.getPrevModeObject().get(0), instanceOf(SettingTime.class));
    assertThat(ms.getPrevModeObject().get(1), instanceOf(Stopwatch.class));
    assertThat(ms.getPrevModeObject().get(2), instanceOf(Timer.class));
    assertThat(ms.getPrevModeObject().get(3), instanceOf(Alarm.class));

    // Make newMode's size 4
    ArrayList<String> selectedMode = new ArrayList<>();
    selectedMode.add("Timer");
    selectedMode.add("Stopwatch");
    selectedMode.add("SettingTime");

    ms.setNewMode((ArrayList<String>)selectedMode.clone()); // Avoid Call-By-Reference

    // {SettingTime, Timer, Stopwatch} -> {Timer, Stopwatch, SettingTime}
    sys.pressConfirmSelectMode();
    ArrayList<String> confirmMode = (ArrayList)ms.getSys().getMenu().clone();
    assertThat(confirmMode.get(2), instanceOf(Timer.class));
    assertThat(confirmMode.get(3), instanceOf(Stopwatch.class));
    assertThat(confirmMode.get(4), instanceOf(SettingTime.class));

    // Test Save Data
    Timer timer = new Timer();
    timer.getRsvTime().clear();

    Calendar temp = Calendar.getInstance();
    temp.clear();
    temp.set(year: 2010, Calendar.FEBRUARY, date: 3, hourOfDay: 20, minute: 30, second: 40);
    timer.setRsvTime((Calendar)temp.clone());

    sys.setMenu(2, timer);
    assertEquals(timer.getRsvTime(), temp);
}
```

7-3 confirmSelectMode

설정된 모드들이 정확하게
저장되었는지 확인

```
sys.enterModeSetting();
selectedMode.clear();
ms.setNewMode((ArrayList<String>)selectedMode.clone()); // Delete Timer
sys.pressConfirmSelectMode();
assertEquals(0, sys.getMaxCnt()); // Completely Deleted

// Timer data is saved
assertEquals(((Calendar)ms.getDb().loadData(1)).get(1), temp);

// Test Load data
sys.enterModeSetting();
selectedMode.clear();
selectedMode.add("Timer"); // Create Timer
ms.setNewMode((ArrayList<String>)selectedMode.clone());

sys.pressConfirmSelectMode();
confirmMode = (ArrayList)sys.getMenu().clone();

assertEquals(temp, ((Timer)confirmMode.get(2)).getRsvTime());
}
```

2061. Unit Testing

All in Develop_T4_SMA.test (1): 41 total, 41 passed

33.60 s

Collapse | Expand

```
&quot;C:\Program Files\Java\jdk1.8.0_191\bin\java.exe&quot; -ea -Didea.test.cyclic.buffer.size=1048576 &quot;C:\Program Files\JetBrains\IntelliJ IDEA 2019.1\bin\idea_rt.jar=6292:C:\Program Files\JetBrains\IntelliJ IDEA 2019.1\bin&quot; &quot;-Dfile.encoding=UTF-8 -classpath &quot;C:\Program Files\JetBrains\IntelliJ IDEA 2019.1\lib\idea_rt.jar;C:\Program Files\JetBrains\IntelliJ IDEA 2019.1\plugins\unit\lib\unit-rt.jar;C:\Program Files\Java\jdk1.8.0_191\lib\charsets.jar;C:\Program Files\Java\jdk1.8.0_191\lib\deploy.jar;C:\Program Files\Java\jdk1.8.0_191\lib\ext\access-bridge-64.jar;C:\Program Files\Java\jdk1.8.0_191\lib\ext\cldrdata.jar;C:\Program Files\Java\jdk1.8.0_191\lib\ext\dnsns.jar;C:\Program Files\Java\jdk1.8.0_191\lib\ext\localedata.jar;C:\Program Files\Java\jdk1.8.0_191\lib\ext\nashorn.jar;C:\Program Files\Java\jdk1.8.0_191\lib\ext\sunec.jar;C:\Program Files\Java\jdk1.8.0_191\lib\ext\sunec_provider.jar;C:\Program Files\Java\jdk1.8.0_191\lib\ext\sunmscapi.jar;C:\Program Files\Java\jdk1.8.0_191\lib\ext\sunpkcs11.jar;C:\Program Files\Java\jdk1.8.0_191\lib\ext\zipfs.jar;C:\Program Files\Java\jdk1.8.0_191\lib\javaws.jar;C:\Program Files\Java\jdk1.8.0_191\lib\jce.jar;C:\Program Files\Java\jdk1.8.0_191\lib\jfr.jar;C:\Program Files\Java\jdk1.8.0_191\lib\jvst.jar;C:\Program Files\Java\jdk1.8.0_191\lib\lms.jar;C:\Program Files\Java\jdk1.8.0_191\lib\resources.jar;C:\Program Files\Java\jdk1.8.0_191\lib\rmi.jar;C:\Users\Public\GitHub\Develop_SMA_T4\out\test\classes;C:\Users\Public\JeonI.gradle\caches\modules-2\files-2.1\com.luckycatlabs\SunriseSunsetCalculator\1.2\ee2cf7467f62325deb4e4533425bcabc8f07d\SunriseSunsetCalculator-1.2.jar;C:\Users\DoHyeon\JeonI.gradle\caches\modules-2\files-2.1\unit\unit4.12\2973d150cd0c1fe998f834810d68f278ea58ec\unit-4.12.jar;C:\Users\DoHyeon\JeonI.gradle\caches\modules-2\files-2.1\org.hamcrest\hamcrest-core\1.3\42a25dc3219429f0e5006006177acab96f010a0d\hamcrest-core-1.3.jar&quot; com.intellij.execution.junit.JUnit4Runner -deVersions @w@C:\Users\DOHYEO~1\AppData\Local\Temp\idea_working_dir\unit.tmp @C:\Users\DOHYEO~1\AppData\Local\Temp\idea_unit.tmp socket:65291 Process finished with exit code 0
```

Alarm Test	31.85 s
Mode Setting Test	1.38 s
RealTime Test	5 ms
Stopwatch Test	22 ms
Sun Test	43 ms
Timer Test	302 ms
Worldtime Test	2 ms

Alarm Test	40.99 s	
AlarmTest.requestExitAlarmSetting	passed	497 ms
AlarmTest.decreaseSection	passed	29.14 s
AlarmTest.ringProperty	passed	18 ms
AlarmTest.requestAlarmNextSection	passed	40 ms
AlarmTest.requestNextAlarm	passed	60 ms
AlarmTest.requestSettingAlarm	passed	33 ms
AlarmTest.requestAlarmOnOff	passed	37 ms
AlarmTest.requestSetupRing	passed	92 ms
AlarmTest.increaseSection	passed	29.04 s
Mode Setting Test	805 ms	
ModeSettingTest.requestSelectMode	passed	3 ms
ModeSettingTest.requestNextMode	passed	0 ms
ModeSettingTest.confirmSelectMode	passed	882 ms
RealTime Test	4 ms	
RealTimeTest.nextSection	passed	0 ms
RealTimeTest.lastCurrSection	passed	0 ms
RealTimeTest.requestChangeType	passed	1 ms
RealTimeTest.calculateTime	passed	0 ms
RealTimeTest.decreaseTime	passed	1 ms
RealTimeTest.setSecond	passed	0 ms
RealTimeTest.increaseTime	passed	2 ms
Stopwatch Test	36 ms	
StopwatchTest.requestStartStopwatch	passed	1 ms
StopwatchTest.requestResetStopwatch	passed	0 ms
StopwatchTest.requestStopStopwatch	passed	1 ms
StopwatchTest.requestSplitStopwatch	passed	29 ms
StopwatchTest.realTimeTaskStopwatch	passed	6 ms
Sun Test	62 ms	
SunTest.realTimeTaskSun	passed	26 ms
SunTest.requestNextNation	passed	13 ms
SunTest.requestSetRise	passed	2 ms
SunTest.requestPrevNation	passed	8 ms
SunTest.linkSun	passed	11 ms
Timer Test	412 ms	
TimerTest.requestExitSetTimerTime	passed	12 ms
TimerTest.requestIncreaseTimerTimeSection	passed	11 ms
TimerTest.requestTimerTime	passed	10 ms
TimerTest.requestResetTimer	passed	11 ms
TimerTest.realTimeTimerTask	passed	333 ms
TimerTest.changeStatus	passed	10 ms
TimerTest.requestDecreaseTimerTimeSection	passed	7 ms
TimerTest.requestNextTimerTimeSection	passed	10 ms
TimerTest.ringOff	passed	8 ms
Ring off operation activated		
Worldtime Test	5 ms	
WorldtimeTest.nextNation	passed	2 ms
WorldtimeTest.prevNation	passed	0 ms
WorldtimeTest.realTimeTaskWorldtime	passed	3 ms

2067. Design Traceability Analysis

