420-B31

# Lab 4

# Testing; Singly Linked Lists

## Answers

Part A, question j - Test Case for getFahrenheit()

**Test Case 9** Accessor for a Temperature's Fahrenheit temperature

| Operation | Purpose | Object State | Expected Result |
| --- | --- | --- | --- |
| Temperature t9 = new Temperature(100.0, ‘F’) | To Create a tempertature object for a Fahrenheit temperature | Units = ‘F’  Temperature = 100.0 | A new temperature object with client supplied values for the attributes |
| T9.getFahrenheit() | To test Fahrenheit accessor method for a Fahrenheit temperature | Units ‘F’  Temperature = 100.0 | 100 |
| T9.setUnits(‘C’) |  | Units = ‘c’ Temperature = 100.0 |  |
| T9.getFahrenheit() | To test Fahrenheit accessor method for a Fahrenheit temperature | Units = ‘C’ Temperature = 100 | 212 |

Part B, getHours() Test Plan

**Test Case 1 – hours for semester 5**

| **Operation** | **Purpose** | **Object State** | **Expected Result** |
| --- | --- | --- | --- |
| CSProgram prog = new CSProgram() | To create a default CSProgram | Linked list initialized with all CS courses | A new CSProgram object with default values |
| prog.gethours(5) | To verify the number of hours for the fifth semester | courseNumber =  420-B50  labHours = 2  theoryHours = 2  courseNumber =  420-C40  labHours = 2  theoryHours = 3  courseNumber =  420-E31  labHours = 3  theoryHours = 2  courseNumber =  420-E50  labHours = 0  theoryHours = 6 | 2 + 2 + 2 + 3 + 3 + 2 + 0 + 6 = 20 |

**Test Case 2 – hours for semester 4**

| **Operation** | **Purpose** | **Object State** | **Expected Result** |
| --- | --- | --- | --- |
| CSProgram prog = new CSProgram() | To create a default CSProgram | Linked list initialized with all CS courses | A new CSProgram object with default values |
| prog.gethours(4) | To verify the number of hours for the fourth semester | courseNumber = 420-B40 labHours = 2 theoryHours = 2 courseNumber = 420-D20  labHours = 2 theoryHours = 2 courseNumber = 420-B40  labHours = 2 theoryHours = 3 courseNumber = 410-E41  labHours = 3 theoryHours = 3 | 2+2+2+2+3+2+2+3+3 = 19 |

**Test Case 3 – Invalid semester (< 1)**

| **Operation** | **Purpose** | **Object State** | **Expected Result** |
| --- | --- | --- | --- |
| CSProgram prog = new CSProgram() | To create a default CSProgram | Linked list initialized with all CS courses | A new CSProgram object with default values |
| prog.gethours(0) | To verify that the method fails for an illegal semester | null | IllegalArgumentException - Semester number must be between 1 and 6. Semester 0 is invalid. |

**Test Case 4 – Invalid semester (> 6)**

| **Operation** | **Purpose** | **Object State** | **Expected Result** |
| --- | --- | --- | --- |
| CSProgram prog = new CSProgram() | To create a default CSProgram | Linked list initialized with all CS courses | A new CSProgram object with default values |
|  |  |  |  |