CT3533 Assignment 1

1.) Book Class:

```java
import java.util.*;

public class Book {
        //Initialising variables
        private String title;
        private String author;
        private ArrayList<Book> bookList;

        //Constructor
        public Book() {
                title = null;
                author = null;
                bookList = new ArrayList<Book>();
        }

        //Getters
        public ArrayList<Book> getBookList() {
                return bookList;
        }

        public String getTitle() {
                return title;
        }

        public String getAuthor() {
                return author;
        }

        //Setters
        public void setBookList(ArrayList<Book> bookList) {
                this.bookList = bookList;
        }

        public void setTitle(String title) {
                this.title = title;
        }

        public void setAuthor(String author) {
                this.author = author;
        }

        //toString Method
        public String toString() {
                return "Title: " + title + " Author: " + author;
        }

}
```

2.) JUnit Test Class:

```java
import static org.junit.Assert.*;

import org.junit.After;
import org.junit.Before;
import org.junit.Ignore;
```

```java
import org.junit.Test;

public class BookJUnitTest {

    //default test
    @Ignore
    @Test
    public void test() {
        fail("Not yet implemented");
    }

    //set up variables
    Book b;

    //setup function
    @Before
    public void setUp() {
        b = new Book();
    }

    //test Constructor
    @Test
    public void testConstructor() {
        assertNotNull(b);
        assertEquals(null, b.getAuthor());
        assertEquals(null, b.getTitle());
    }

    //Test Get/Set Author
    @Test
    public void testSetGetAuthor() {
        b.setAuthor("John Doe");
        assertEquals("John Doe", b.getAuthor());
    }

    //Test Get/Set Title
    @Test
    public void testSetGetTitle(){
        b.setTitle("BookName");
        assertEquals("BookName", b.getTitle());
    }

    //Test toString
    @Test
    public void testToString() {
        b.setTitle("BookTitle");
        b.setAuthor("John Doe");
        assertEquals("Title: BookTitle Author: John Doe", b.toString());
    }

    //Test to add an element to the ArrayList
    @Test
    public void testAdd() {
        b.getBookList().add(b);
        assertEquals(1, b.getBookList().size());
    }
```

```java
        //Test to remove an element from the ArrayList
        @Test
        public void testRemove() {
                b.getBookList().remove(b);
                assertEquals(0, b.getBookList().size());
        }

        //teardown function
        @After
        public void tearDown() {
                b = null;
        }
}
```

3.) JUnit test: