

4CCS1DST – Data Structures

Lecture 2 – Exercises

Exercise 1

```

class TestProgression2 {
    public static void main(String[] args) {
        Progression prog;

        prog = new ArithProgression(5);
        prog.printProgression(5);
        prog.printProgression(7);

        prog = new GeomProgression(2);
        prog.printProgression(5);
        prog.printProgression(7);

        prog = new FibonacciProgression(3);
        prog.printProgression(5);
        prog.printProgression(7);
    }
}

```

>java TestProgression2

0 5 10 15 20

0 5 10 15 20 25 30

1 2 4 8 16

1 2 4 8 16 32 64

0 3 3 6 9

0 6 6 12 18 30 48

?

Explain why FibonacciProgression behaves differently than other subclasses.
 Modify this class to achieve the expected behaviour.

Exercise 2

◆ In class `SLinkedList<E>`, show Java code for methods:

// return the first element, but don't remove it from the list

```
public E elementAtHead() { ... }
```

```
public void insertAtHead( E newElem ) { ... }
```

```
public void insertAtTail( E newElem ) { ... }
```

```
public E removeAtHead() { ... }
```

Exercise 3

Give code for method “contains” in this class:

```
public class SLinkedListExtended<E> extends SLinkedList<E> {  
    // returns true if and only if, "element" is in the list  
    public boolean contains(E element) { ... }  
  
    public static void main(String[ ] args) {  
        SLinkedListExtended<Integer> list =  
            new SLinkedListExtended<Integer>();  
        list.insertAtHead(2); list.insertAtHead(4); list.insertAtHead(6);  
        System.out.println( "the list contains 4: " + list.contains(4));  
        // prints: "the list contains 4: true "  
    }  
}
```