

## SENG2200/6220 –Programming Languages & Paradigms

### Self-Quiz Solutions for Week 6, Semester 1, 2020

#### True/False Questions.

1. Iterator is the concept only for Java.  
**False**  
Iterator is a general concept for many programming languages, e.g., C++.
2. A container can have many iterators, but an iterator can associate with only one container.  
**True**
3. An iterator cannot exist after the associated container is destroyed, i.e. they have the same lifetime.  
**False**  
Iterator can have different lifetime from container, but an iterator does not make sense without an existing container.
4. Iterator and container objects can work under Polymorphism.  
**True**
5. A container must implement the `Iterable<E>` interface to instantiate iterator objects.  
**False**  
`Iterable<E>` is not mandatory for iterator instantiation, but we should always do in this way.
6. An iterator class should be modelled as a private inner class of a container class.  
**True**
7. The iterator object `iter` will throw an exception.

```
Iterator<MyClass> iter = tcol.iterator();
while (iter.hasNext()) {
    MyClass myObject = iter.next();
    if ( ... some condition ... )
        tcol.removeLast();
}
myObject = iter.next();
```

**True**

### Short-Answer Questions

8. What is a collections framework? What advantages can we have by using the collections framework?

A collections framework is a unified architecture for representing and manipulating collections, enabling collections to be manipulated independently of implementation details.

- Reduces programming effort – provides standard data structures and algorithms.
- Increases performance – optimised design and high-performance implementation of data structures and algorithms.
- Reduces the effort required to design and implement APIs.
- Software reuse

9. The next() method of the Iterator<E> interface needs to check two preconditions, what are they?

1. Check if there is an element to be visited. Throws a NoSuchElementException if hasNext() is false.
2. Check container modification. Throws a ConcurrentModificationException if the iterator's backing store (the collection) has been modified by the collection's mutators.