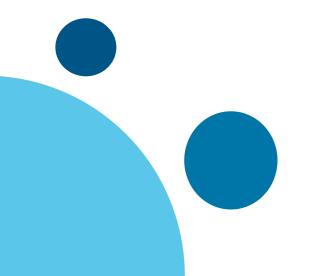
# CSD-4464 Java EE

Class 6: Streams





#### Streams

- Stream is a new abstract layer introduced in Java 8.
- Stream represents a sequence of objects from a source, which supports aggregate operations
- Streams are lazy; computation on the source data is only performed when the terminal operation is initiated, and source elements are consumed only as needed.



#### Streams cont.

- Streams support many transformation methods, similar to the Optional class (e.x map() filter() flatMap())
- Stream() vs ParallelStream()
- You can create streams from the Stream Class, or by calling stream()
  on a collection

Example

myList.stream() //you just create a stream containing the elements of your list



### ParallelStream()

- Multithreaded code tends to be error prone and very difficult to read, Java8 attempts to solve this with ParallelStreams, a simple way to apply functions to datasets in parallel over sequentially
- Except for operations identified as explicitly nondeterministic, such as findAny(), whether a stream executes sequentially or in parallel should not change the result of the computation.
- Default thread count may vary from JVM to JVM, generally threads are pulled from ForkJoinPool.commonPool()



## Streams.findFirst() + findAny()

- Returns an Optional describing an element in the stream, or an empty optional if the stream is empty
- findAny() returns any value it finds in the stream
- findFirst() returns the first value it finds in the stream
- Both are short-circuiting terminal operations



# .flatMap()

- Used for 1 to many relations
- Returns a stream containing the values from the mapped streams
  e.x A school object, has a list of Class objects, which have a list of Student objects

School.getClasses().stream()

.flatMap(class -> class.getStudents.stream())//returns Stream<student>



# .limit() .skip() .[any/all/none]Match()

- .limit(n) sets the max number of elements to flow through the stream
- .skip(n) skips a number of elements in the streams
- .anyMatch(Predicate) returns true if any values in the stream matches
- .allMatch(Predicate) returns true if all values in the stream matches
- .noneMatch(Predicate) returns true if no values in the stream matches



## .iterate() .generate()

- Returns an infinite stream
- .iterate() generates values similar to a for-loop

```
Syntax - Stream.iterate(0, n \rightarrow n + 1).limit(10) for (int I = 0; I < 10; I + +)
```

.generate() generates values from a provided supplier
 Syntax - Stream.generate(new Random()::nextInt)

