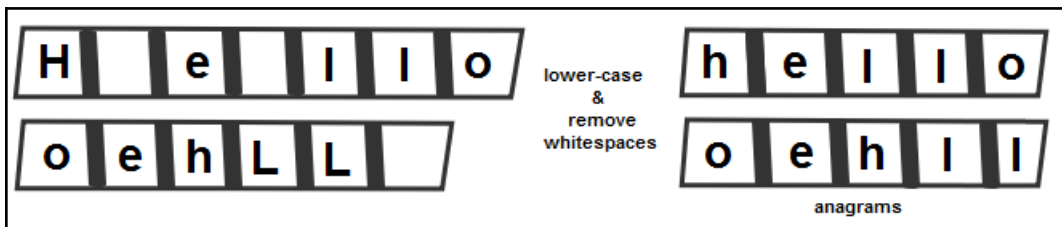
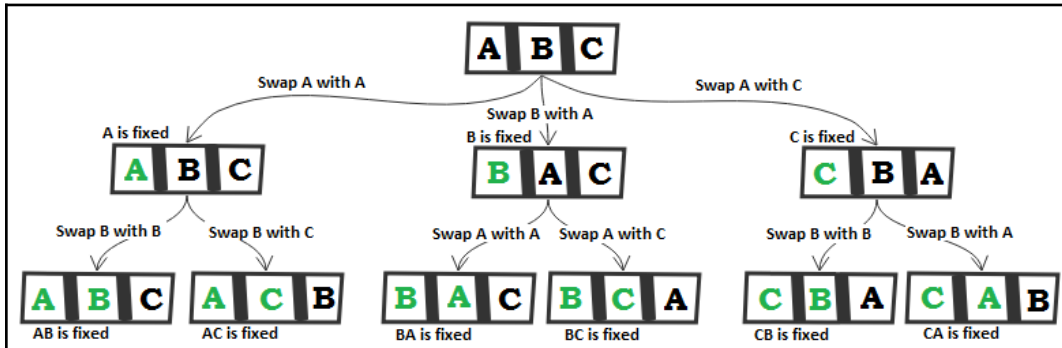


Chapter 1: Strings, Numbers, and Math



Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday

```
Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
```

```
Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
```

```
<html>
  <body>
    <h2>
      Hello world!
    </h2>
  </body>
</html>
```

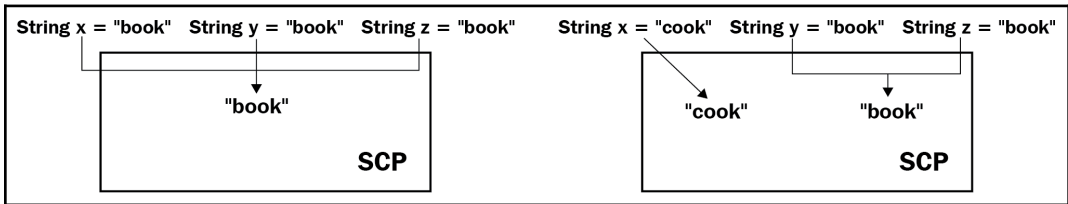
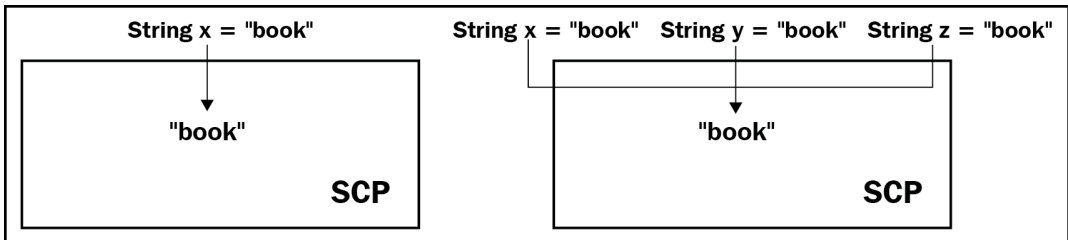
X	Y	AND	OR	XOR
0	0	0	0	0
0	1	0	1	1
1	0	0	1	1
1	1	1	1	0

Chapter 2: Objects, Immutability, and Switch Expressions

```

⊕ requireNonNullElseThrow(T obj, X exception) T
⊕ requireNonNullElseThrowIAE(T obj, String message) T
⊕ requireNonNullElseThrowIAE(T obj, Supplier<String> messageSupplier) T
⊕ requireNotNullElseThrow(T obj, Supplier<? extends X> exceptionSupplier) T

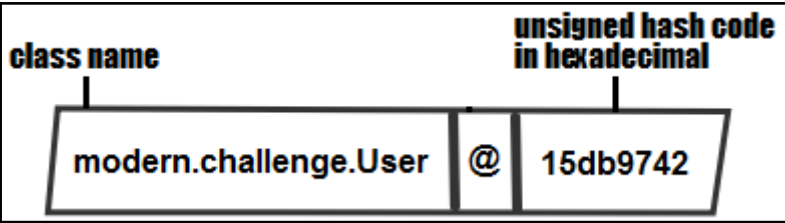
```



```

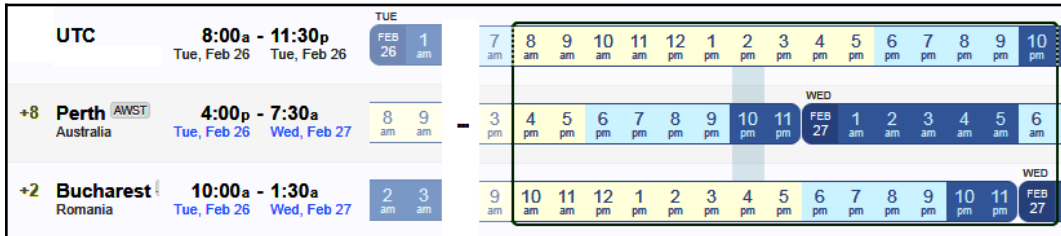
● deepClone (T o) T
● deepCloneDontCloneInstances (T o, Object... dontCloneThese) T
● fastCloneOrNewInstance (Class<T> c) T
● shallowClone (T o) T
● copyPropertiesOfInheritedClass (T src, E dest) void
● dontClone (Class<?>... c) void
● dontCloneInstanceOf (Class<?>... c) void
● equals (Object obj) boolean
● getClass () Class<?>
● getDumpCloned () IDumpCloned
...

```

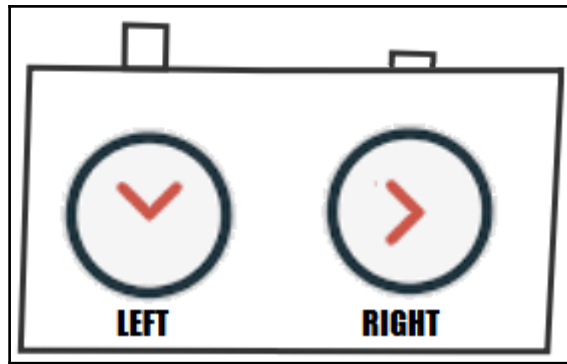


```
57 | the switch expression does not cover all possible input values  
58 | ----  
58 | (Alt-Enter shows hints) | tePlayer(PlayerTypes playerType) {  
60 |     return switch (playerType) {  
61 |         case TENNIS->  
        |             new TennisPlayer();
```

Chapter 3: Working with Date and Time



```
class DEFAULT_TIME_ZONE {
    ZoneId ZoneId
    Instant dateToInstant(Date date) Instant
    LocalDate dateToLocalDate(Date date) LocalDate
    LocalDateTime dateToLocalDateTime(Date date) LocalDateTime
    LocalTime dateToLocalTime(Date date) LocalTime
    OffsetDateTime dateToOffsetDateTime(Date date) OffsetDateTime
    OffsetTime dateToOffsetTime(Date date) OffsetTime
    ZonedDateTime dateToZonedDateTime(Date date) ZonedDateTime
    Date instantToDate(Instant instant) Date
    Date localDateTimeToDate(LocalDateTime localDateTime) Date
    Date localDateToDate(LocalDate localDate) Date
    Date localTimeToDate(LocalTime localTime) Date
    Date offsetDateTimeToDate(OffsetDateTime offsetDateTime) Date
    Date offsetTimeToDate(OffsetTime offsetTime) Date
    Date zonedDateTimeToDate(ZonedDateTime zonedDateTime) Date
}
```



Chapter 4: Type Inference

Decompilation of the class containing this method:

```
public Object fetchTransferableData(String data)
    throws UnsupportedOperationException, IOException {

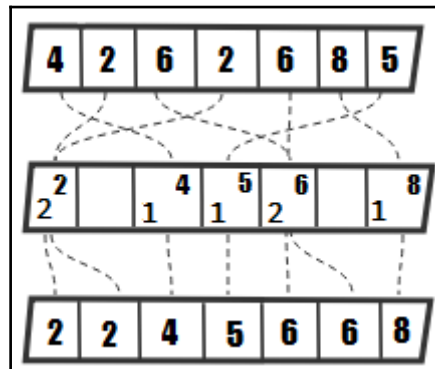
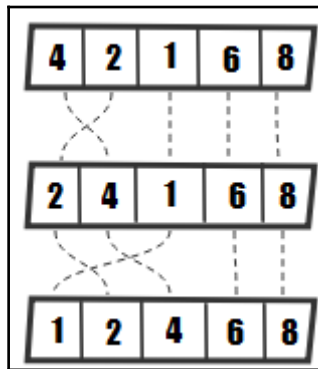
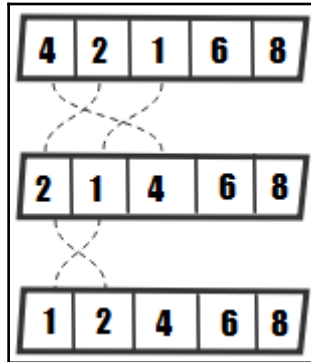
    StringSelection ss = new StringSelection(data);
    DataFlavor[] df = ss.getTransferDataFlavors();
    Object obj = ss.getTransferData(df[0]);

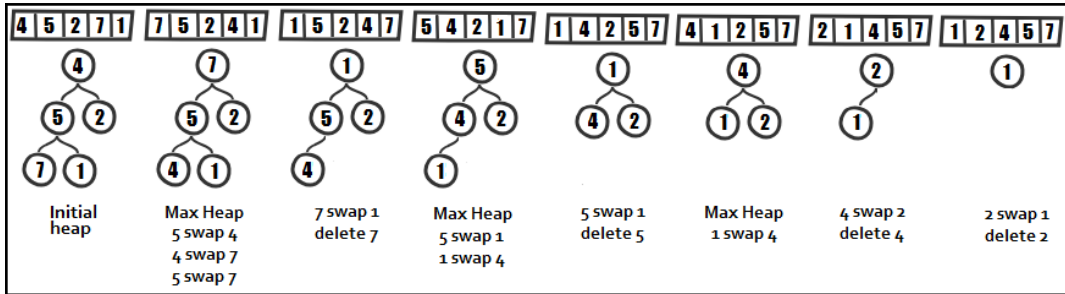
    return obj;
}
```

Decompilation of the class containing these declarations:

```
int intNumber = 10;
int longNumber = 10;
int floatNumber = 10;
int doubleNumber = 10;
```

Chapter 5: Arrays, Collections, and Data Structures





```

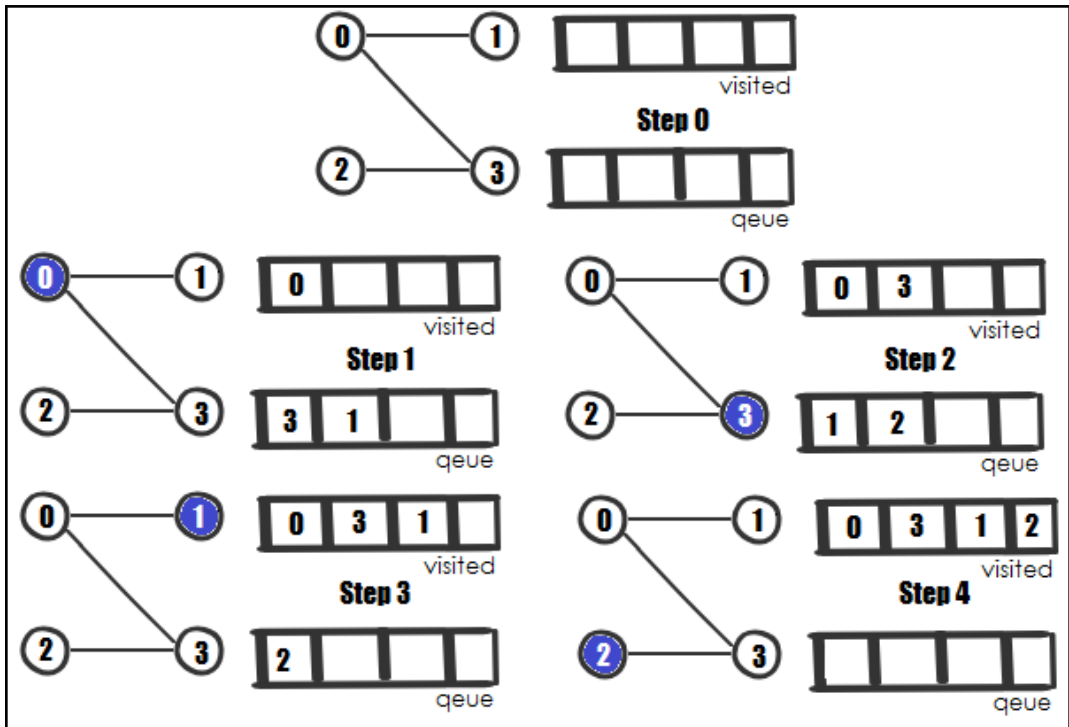
containsElementObjectV1(T[] arr, T toContain) boolean
containsElementObjectV2(T[] arr, T toContain, Comparator<? super T> c) boolean
containsElementObjectV3(T[] arr, T toContain, Comparator<? super T> c) boolean
containsElementV1(int[] arr, int toContain) boolean
containsElementV2(int[] arr, int toContain) boolean
containsElementV3(int[] arr, int toContain) boolean
findIndexOfElementObjectV1(T[] arr, T toFind) int
findIndexOfElementObjectV2(T[] arr, T toFind, Comparator<? super T> c) int
findIndexOfElementObjectV3(T[] arr, T toFind, Comparator<? super T> c) int
findIndexOfElementV1(int[] arr, int toFind) int
findIndexOfElementV2(int[] arr, int toFind) int

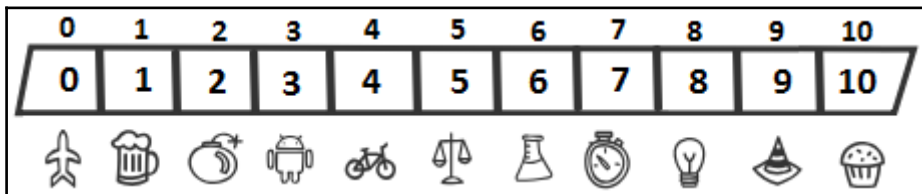
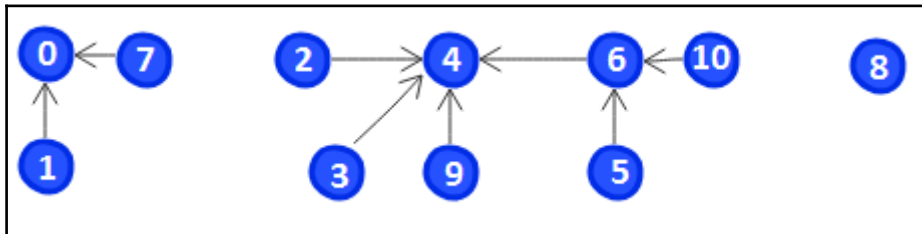
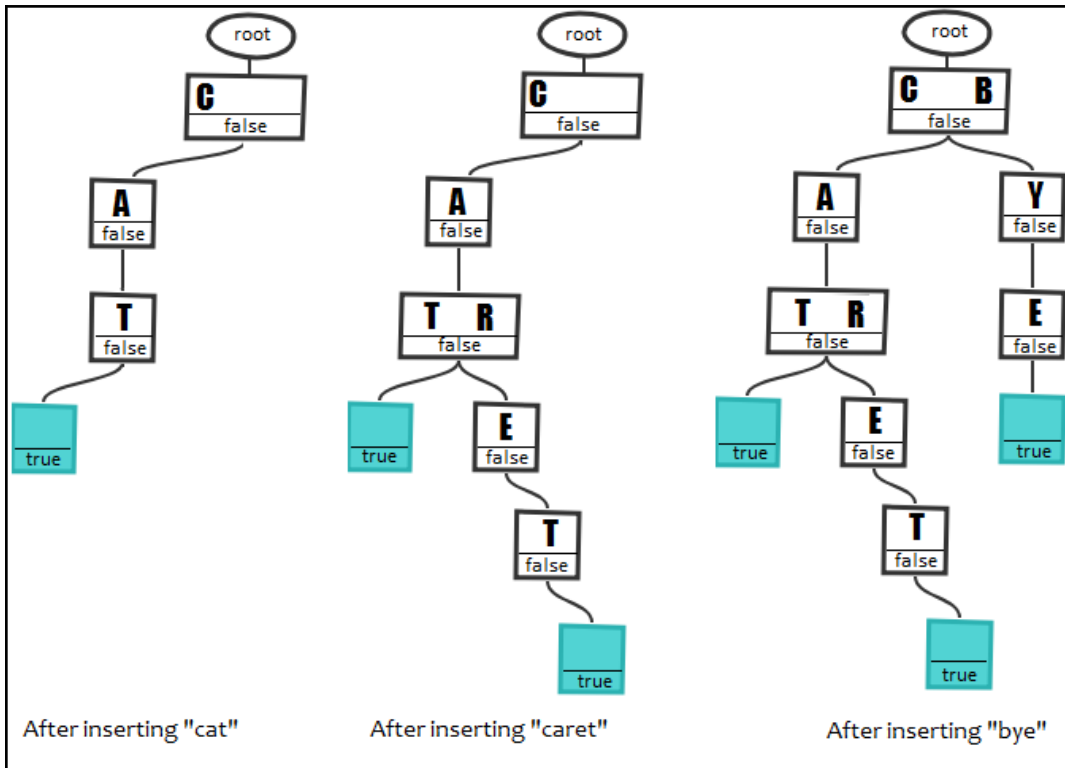
```

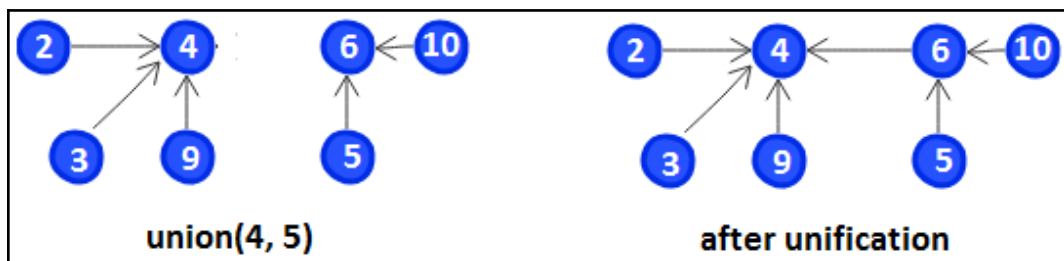
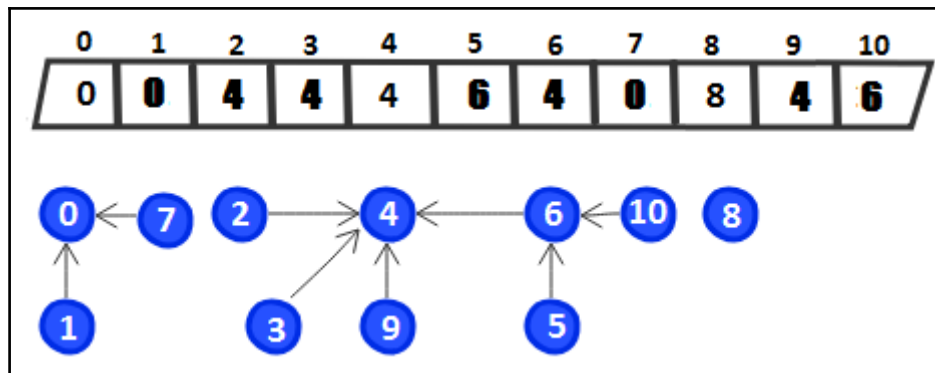
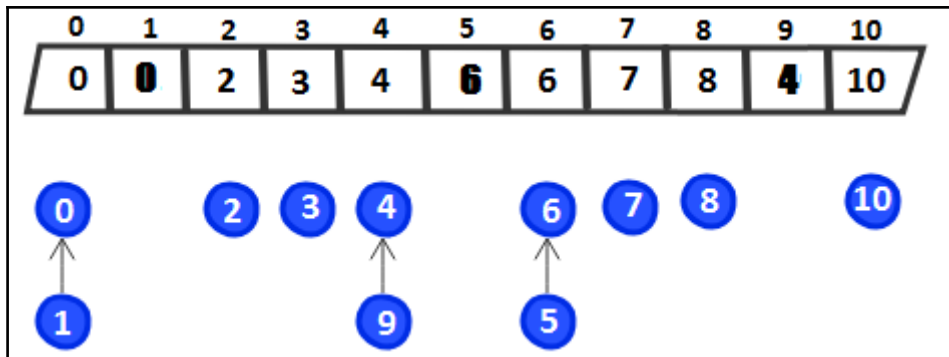
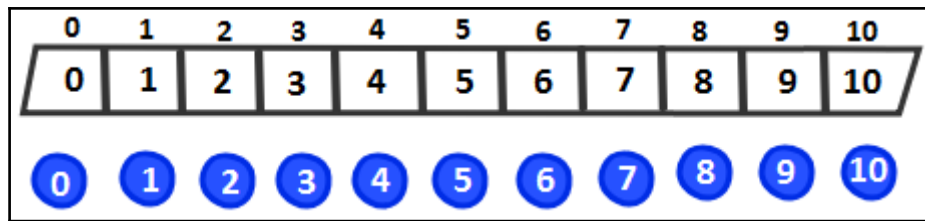
```

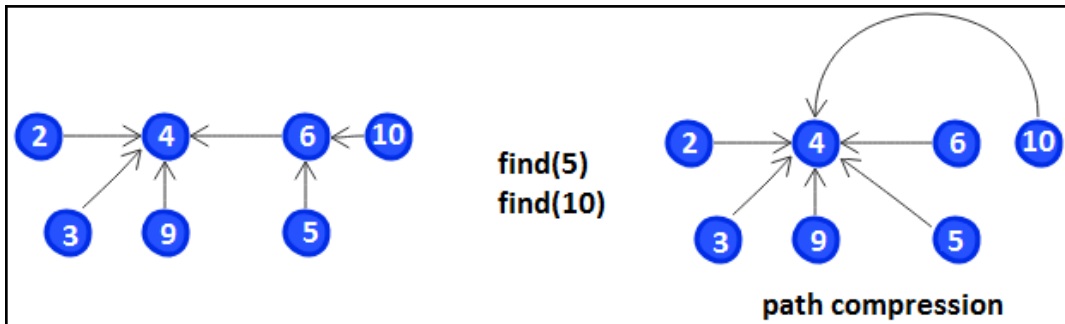
sortByKeyList(Map<K, V> map) List<K>
sortByKeyStream(Map<K, V> map, Comparator<? super K> c) Map<K, V>
sortByKeyTreeMap(Map<K, V> map) TreeMap<K, V>
sortByValueList(Map<K, V> map) List<V>
sortByValueStream(Map<K, V> map, Comparator<? super V> c) Map<K, V>

```







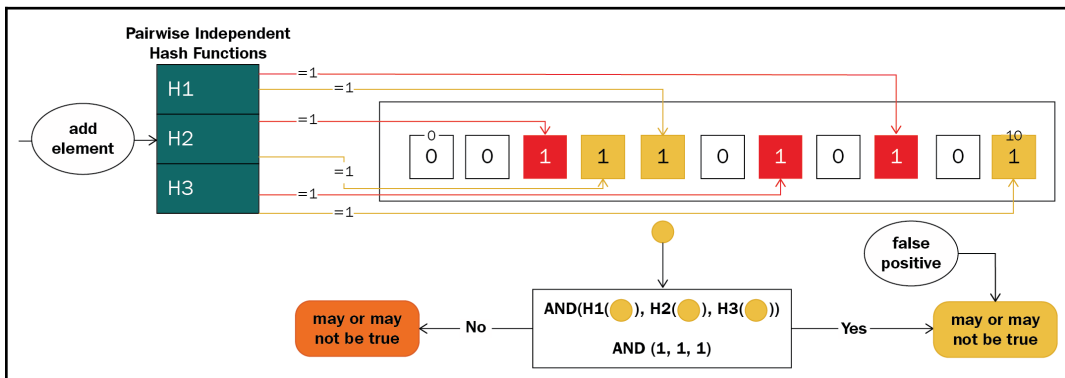


Value	Index	Binary	LSB	Range of responsibility	BIT
5	16	10000 ₂	2 ⁴		91
11	15	01111 ₂	2 ⁰	1	11
0	14	01110 ₂	2 ¹	2	9
9	13	01101 ₂	2 ⁰	1	9
4	12	01100 ₂	2 ²		8
1	11	01011 ₂	2 ⁰	1	1
3	10	01010 ₂	2 ¹	2	3
0	9	01001 ₂	2 ⁰	1	0
13	8	01000 ₂	2 ³		58
7	7	00111 ₂	2 ⁰	1	7
9	6	00110 ₂	2 ¹	2	21
12	5	00101 ₂	2 ⁰	1	12
8	4	00100 ₂	2 ²	4	17
5	3	00011 ₂	2 ⁰	1	5
1	2	00010 ₂	2 ¹	2	4
3	1	00001 ₂	2 ⁰	1	3
0	0	-			0

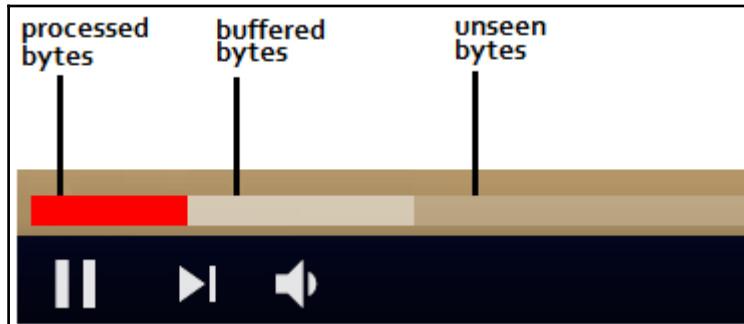
Value	Index	Binary	LSB	Range of responsibility	BIT
5	16	10000 ₂	2 ⁴		91
11	15	01111 ₂	2 ⁰	1	11
0	14	01110 ₂	2 ¹	2	9
9	13	01101 ₂	2 ⁰	1	9
4	12	01100 ₂	2 ²	4	8
1	11	01011 ₂	2 ⁰	1	1
3	10	01010 ₂	2 ¹	2	3
0	9	01001 ₂	2 ⁰	1	0
13	8	01000 ₂	2 ³	8	58
7	7	00111 ₂	2 ⁰	1	7
9	6	00110 ₂	2 ¹	2	21
12	5	00101 ₂	2 ⁰	1	12
8	4	00100 ₂	2 ²	4	17
5	3	00011 ₂	2 ⁰	1	5
1	2	00010 ₂	2 ¹	2	4
3	1	00001 ₂	2 ⁰	1	3
0	0	-			0

Range Queries Examples

$\text{sum}[2,9] = \text{sum}[1,9] - \text{sum}[1,1] = (0+58) - (3) = 55$
 $\text{sum}[5,10] = \text{sum}[1,10] - \text{sum}[1,5] = (3+58) - (17) = 44$
 $\text{sum}[9,13] = \text{sum}[1,13] - \text{sum}[1,9] = (9+8+58) - (0+58) = 17$
 $\text{sum}[15,16] = \text{sum}[1,16] - \text{sum}[1,15] = (91) - (9+8+58) = 16$



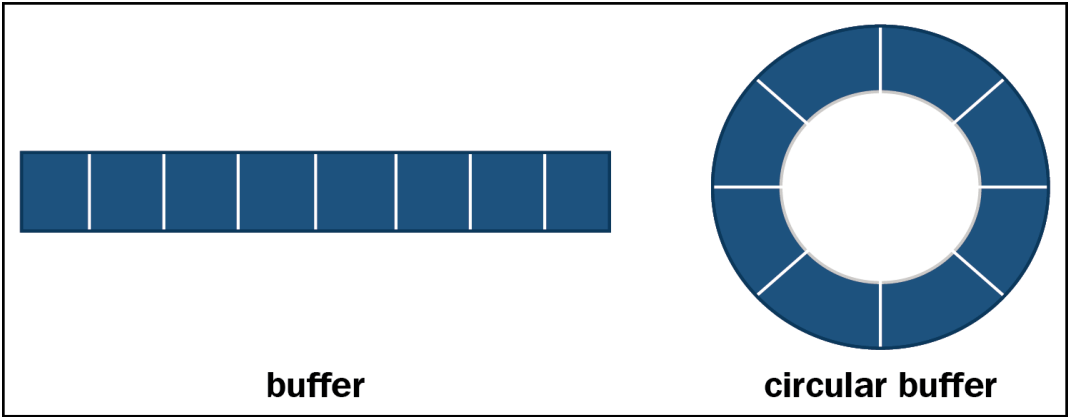
Chapter 6: Java I/O Paths, Files, Buffers, Scanning, and Formatting

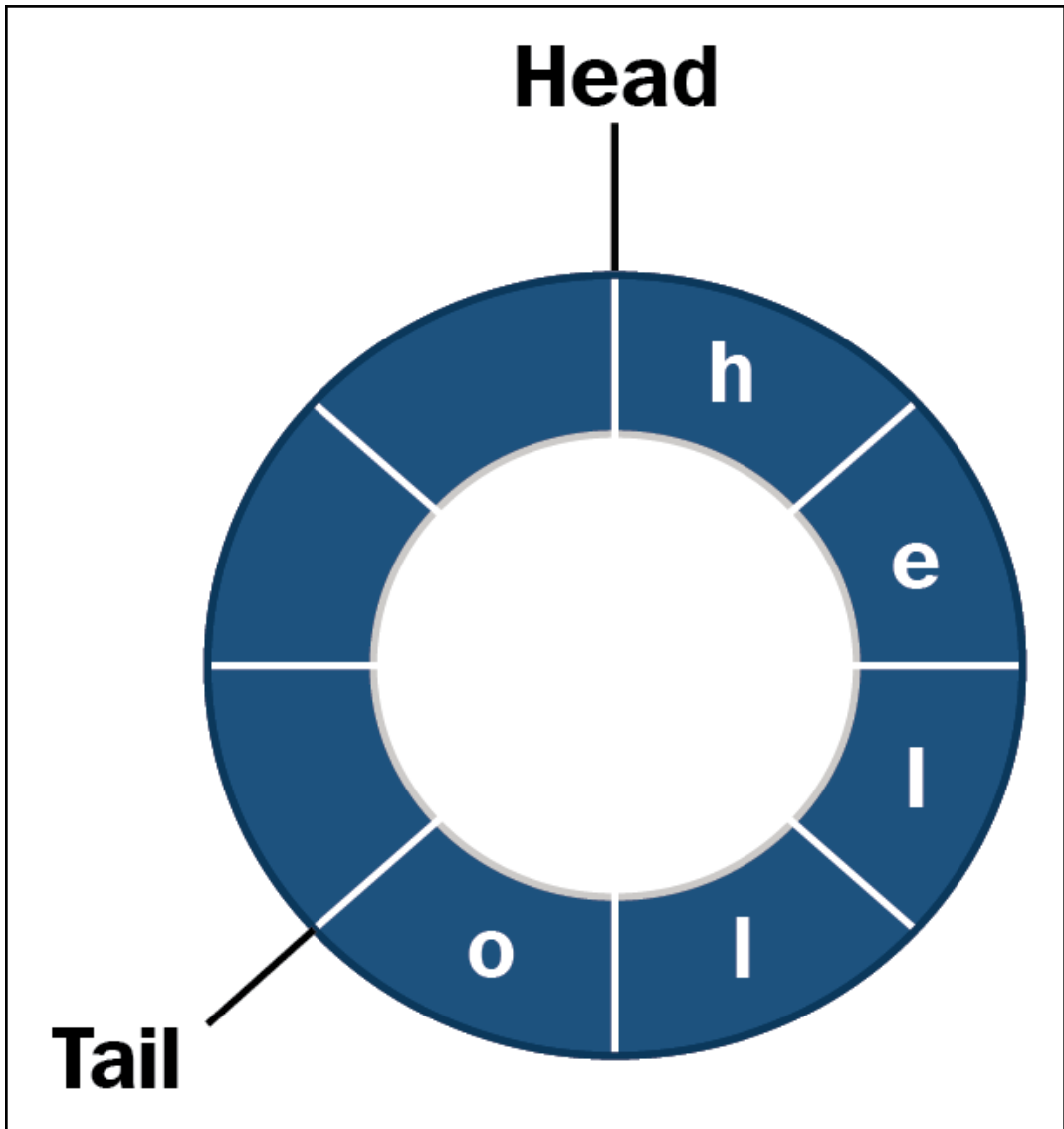


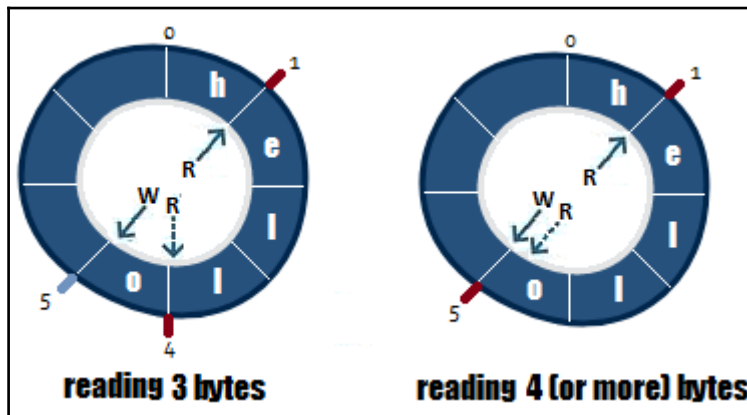
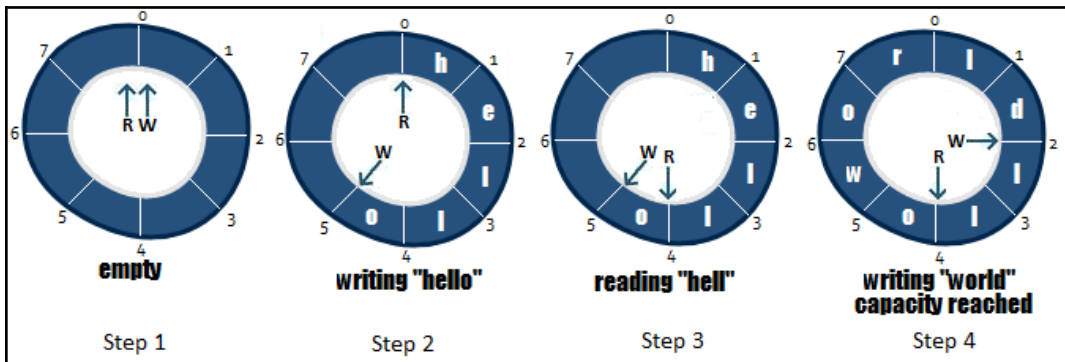
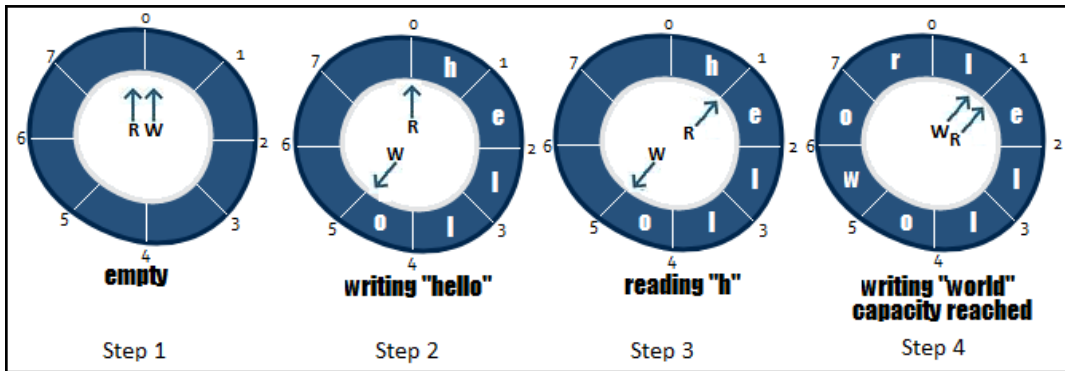
Raw JSON	Array-like JSON	Map-like JSON
<pre>{ "type": "Gac", "weight": 2000 } { "type": "Hemi", "weight": 1200 }</pre>	<pre>[{ "type": "Gac", "weight": 2000 }, { "type": "Hemi", "weight": 1200 }]</pre>	<pre>{ "A": { "type": "Gac", "weight": 2000 }, "B": { "type": "Hemi", "weight": 1200 } }</pre>
melons_raw.json	melons_array.json	melons_map.json

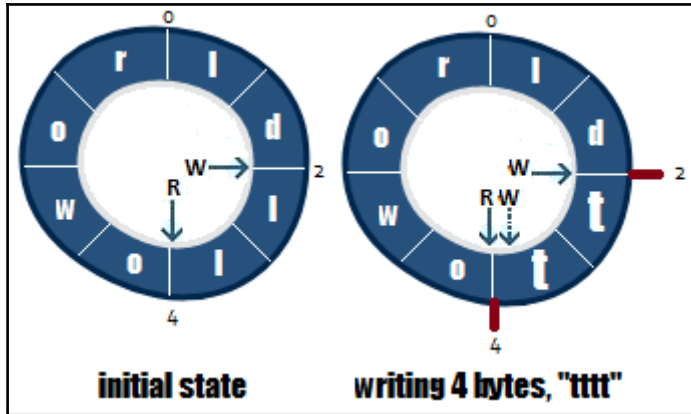
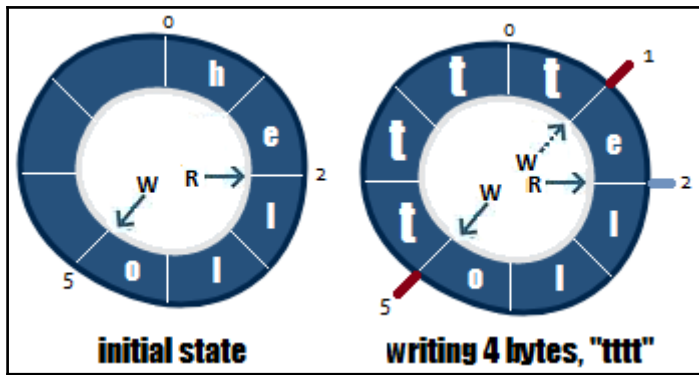
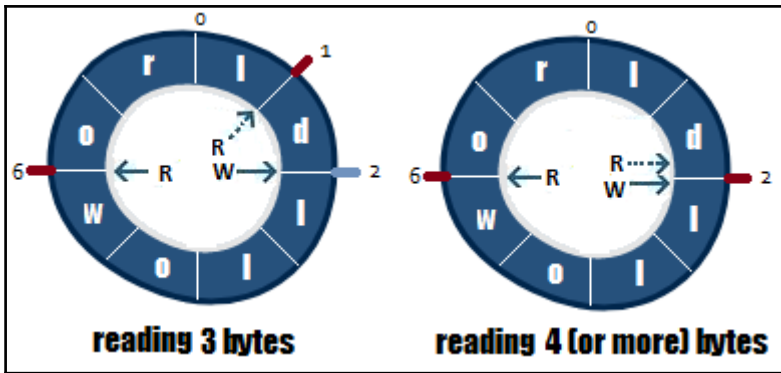
```
melon.csv
CSV
Gaac,2000
Hemi,1500
Cantaloupe,800
Golden Prize,2300
Crenshaw,3000
```

<p>This is a file for testing mismatches between two files!</p> <p>file1.txt</p>	<p>This is a file for testing mismatches between two files!</p> <p>file2.txt</p>	<p>This is a file for testing mismatches between two files!</p> <p>file3.txt</p>	<p>This is a file for testing mismatches between two files.</p> <p>file4.txt</p>
--	--	--	--









Obtained		Wanted	
78910	0.9276730641526881	78910	0.928
83222	0.28423903775300785	83222	0.284
5593	0.866538798997145	5593	0.867
57329	0.9145723363689985	57329	0.915
61443	0.41527451214386724	61443	0.415
9043	0.8442927124583571	9043	0.844
474	0.9159122616950742	474	0.916
45763	0.04448867226365116	45763	0.044
26671	0.4648636732351614	26671	0.465
24096	0.12870733626570974	24096	0.129


```
78,910 bytes
83,222 bytes
 5,593 bytes
57,329 bytes
61,443 bytes
 9,043 bytes
   474 bytes
45,763 bytes
26,671 bytes
24,096 bytes
```

```
                                doubles.txt
23.4556 1.23 4.55 2.33
5.663 956.34343 23.2333
0.3434 0.788
```


```
                                                                people.txt
Matt,Kyle,23,San Francisco;
Darel,Der,50,New York;Sandra,Hui,40,Dallas;
Leonard,vurt,43,Bucharest;Mark,Seil,19,Texas;Ulm,Bar,43,Kansas
```

Chapter 7: Java Reflection Classes, Interfaces, Constructors, Methods, and Fields


```
JDK 10 javap  
Compiled from "Car.java"  
public class modern.challenge.Car {  
    public modern.challenge.Car();  
    public static modern.challenge.Car newCar(java.lang.String, java.lang.String)  
    throws java.lang.NoSuchFieldException, java.lang.IllegalArgumentException, java.  
    lang.IllegalAccessException;  
    static java.lang.String access$000(modern.challenge.Car);  
}
```



```
JDK 11 javap  
SourceFile: "Car.java"  
NestMembers:  
    modern/challenge/Car$Engine  
InnerClasses:  
    public #14= #6 of #4;  
    // Engine=class modern/challenge/Car$Engine  
    of class modern/challenge/Car
```



```
JDK 11 javap  
SourceFile: "Car.java"  
NestHost: class modern/challenge/Car  
InnerClasses:  
    public #21= #9 of #29;  
    // Engine=class modern/challenge/Car$Engine of class  
    modern/challenge/Car
```



```
@Packt  
package modern.challenge;
```

```
@Fruit(name = "melon", value = "delicious")  
public class Melon extends @Family Cucurbitaceae  
    implements @ByWeight Comparable {
```

```
@Ripe(true)
public void eat() throws @Runtime IllegalStateException {
}
```

```
@Ripe(true)
public void eat() throws @Runtime IllegalStateException {
}
```

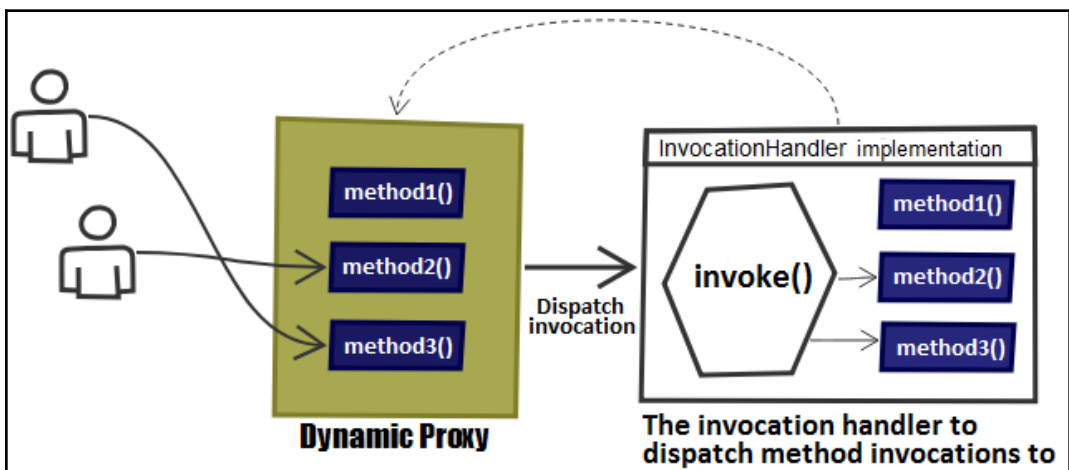
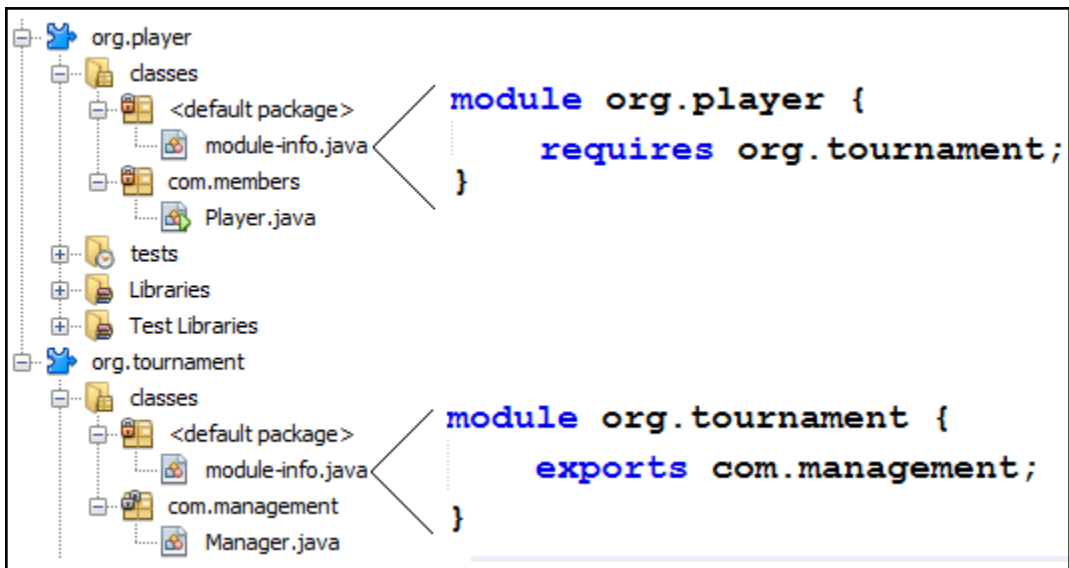
```
public @Shape("oval") List<Seed> seeds() {
    return Collections.emptyList();
}
```

```
public void slice(@Ripe(true) @Shape("square") int noOfSlices) {
}
```

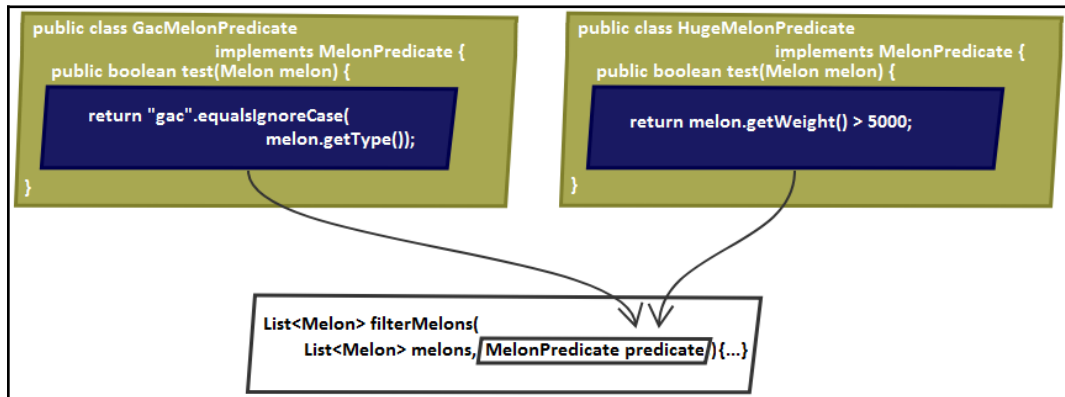
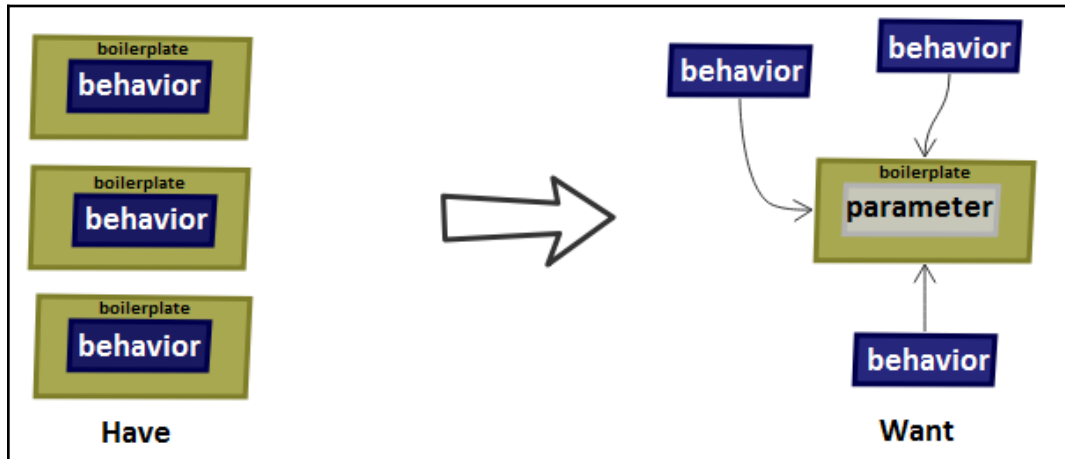
```
@Unit
private final int weight;
```

```
@Fruit(name = "melon", value = "delicious")
public class Melon extends @Family Cucurbitaceae
    implements @ByWeight Comparable {
```

```
@Fruit(name = "melon", value = "delicious")
public class Melon extends @Family Cucurbitaceae
    implements @ByWeight Comparable {
```



Chapter 8: Functional Style Programming - Fundamentals and Design Patterns



```

List<Melon> europeans = Filters.filterMelons(
    melons, new MelonPredicate() {
        @Override
        public boolean test(Melon melon) {

            return "europe".equalsIgnoreCase(melon.getOrigin());

        }
    });

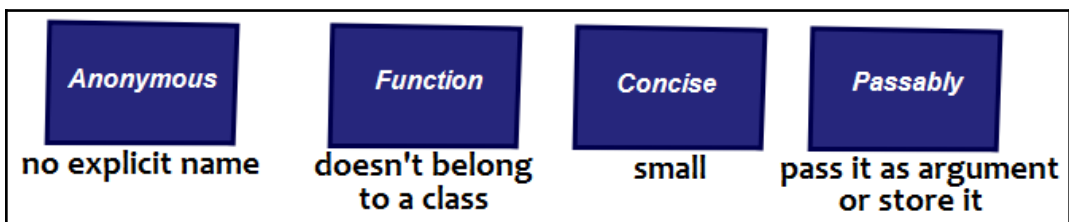
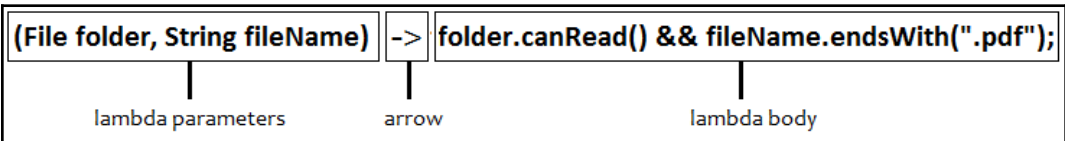
```

21 This anonymous inner class creation can be turned into a lambda expression.
 22 ----
 (Alt-Enter shows hints)

```

List<Melon> europeans = Filters
    .filterMelons(melons, new MelonPredicate() {
        ...
    })

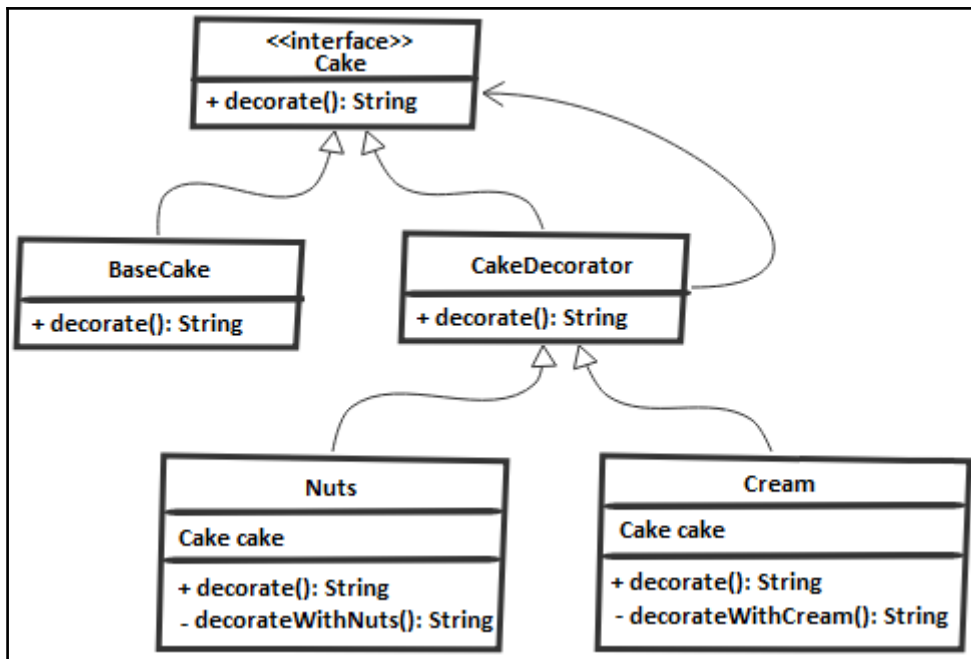
```

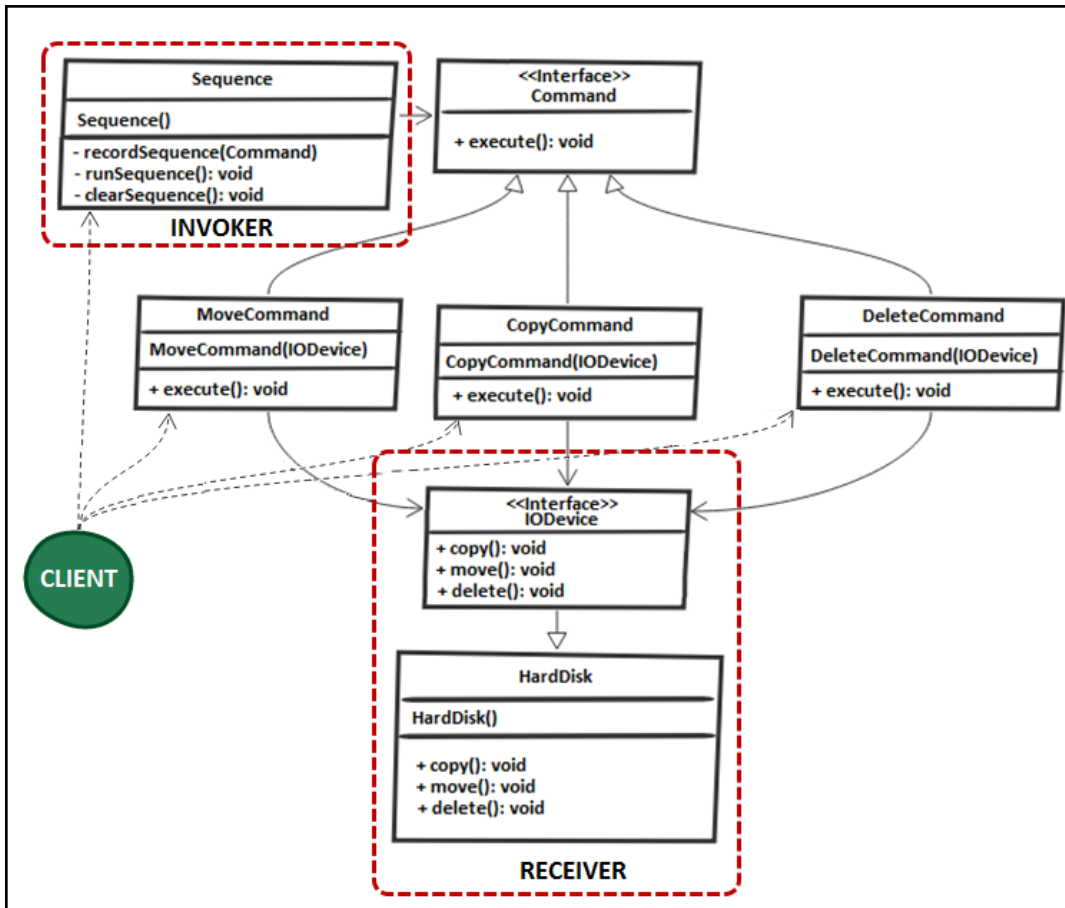


```

try (Scanner scanner = new Scanner(
    Path.of("doubles.txt"), StandardCharsets.UTF_8)) {
}

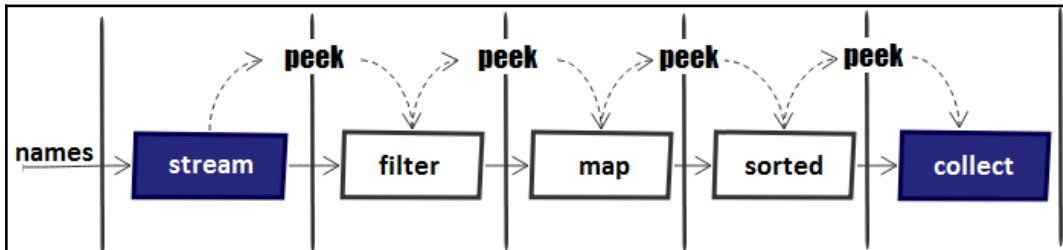
```





Chapter 9: Functional Style Programming - a Deep Dive

```
Exception in thread "main" java.lang.NullPointerException
    at modern.challenge.Main.lambda$main$5(Main.java:28)
    at java.base/java.util.stream.ReferencePipeline$3$1.accept(ReferencePipeline.java:195)
    at java.base/java.util.Spliterators$ArraySpliterator.forEachRemaining(Spliterators.java:948)
    at java.base/java.util.stream.AbstractPipeline.copyInto(AbstractPipeline.java:484)
    at java.base/java.util.stream.AbstractPipeline.wrapAndCopyInto(AbstractPipeline.java:474)
    at java.base/java.util.stream.ReduceOps$ReduceOp.evaluateSequential(ReduceOps.java:913)
    at java.base/java.util.stream.AbstractPipeline.evaluate(AbstractPipeline.java:234)
    at java.base/java.util.stream.ReferencePipeline.collect(ReferencePipeline.java:578)
    at modern.challenge.Main.main(Main.java:29)
```



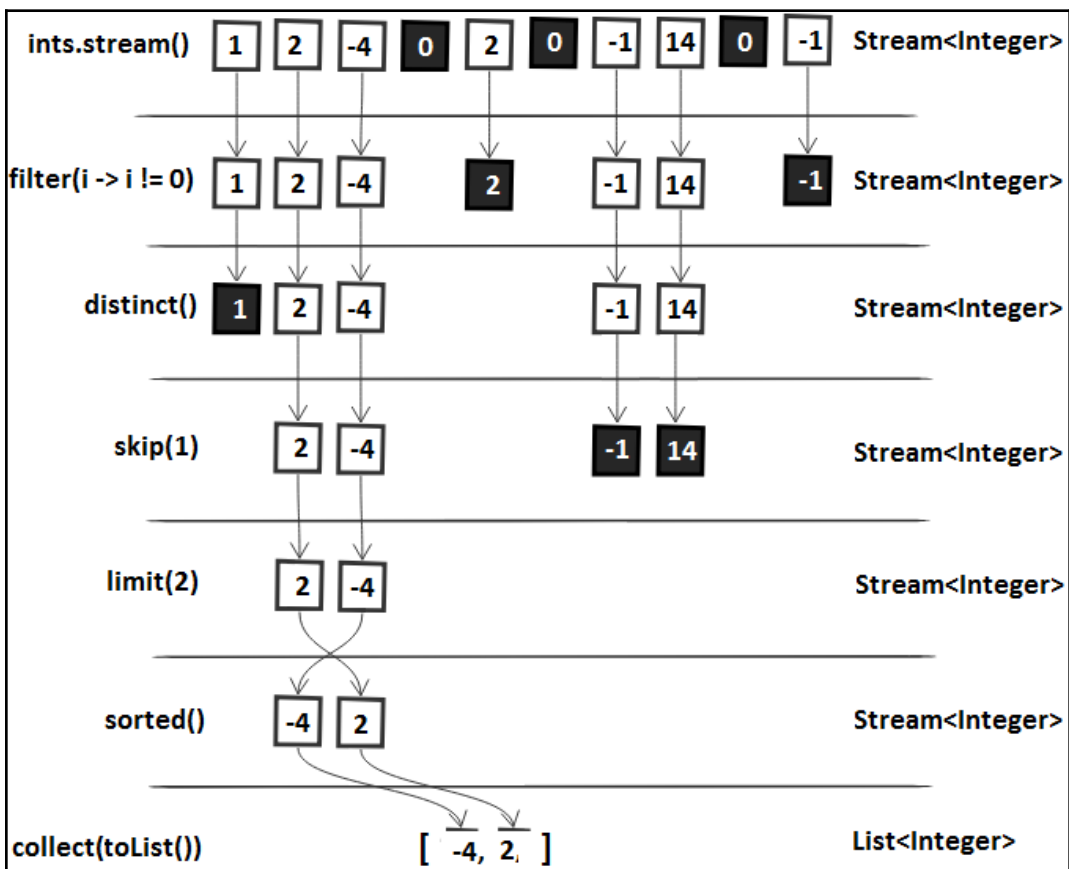
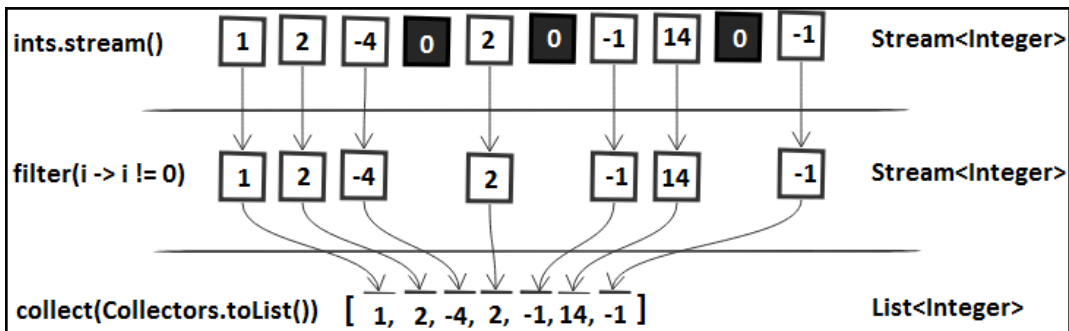
After:

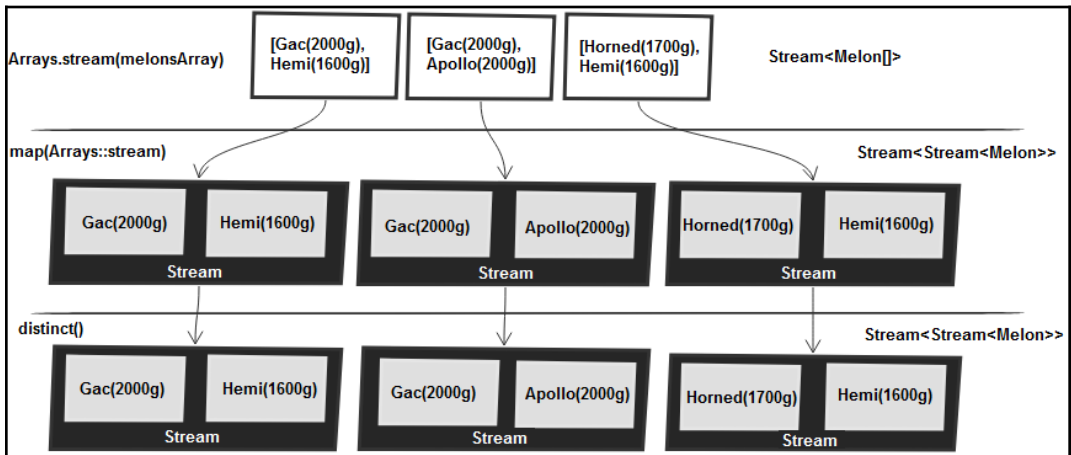
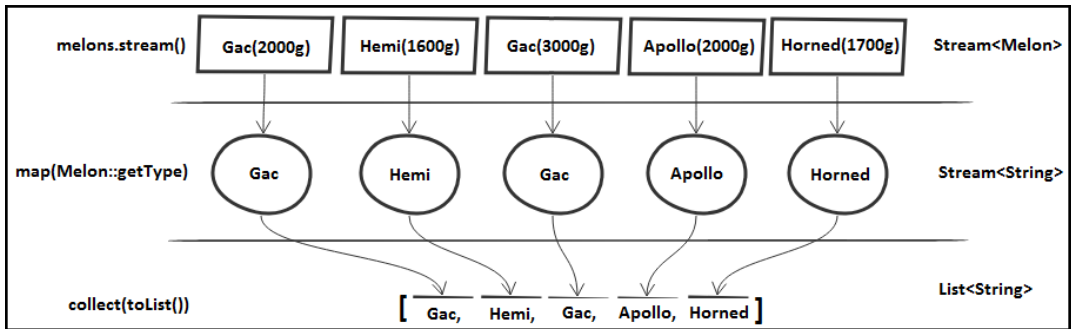
```
stream(): anna
stream(): bob
stream(): christian
filter(): christian
map(): CHRISTIAN
stream(): carmen
filter(): carmen
map(): CARMEN
stream(): rick
stream(): carla
filter(): carla
map(): CARLA
sorted(): CARLA
sorted(): CARMEN
sorted(): CHRISTIAN
```

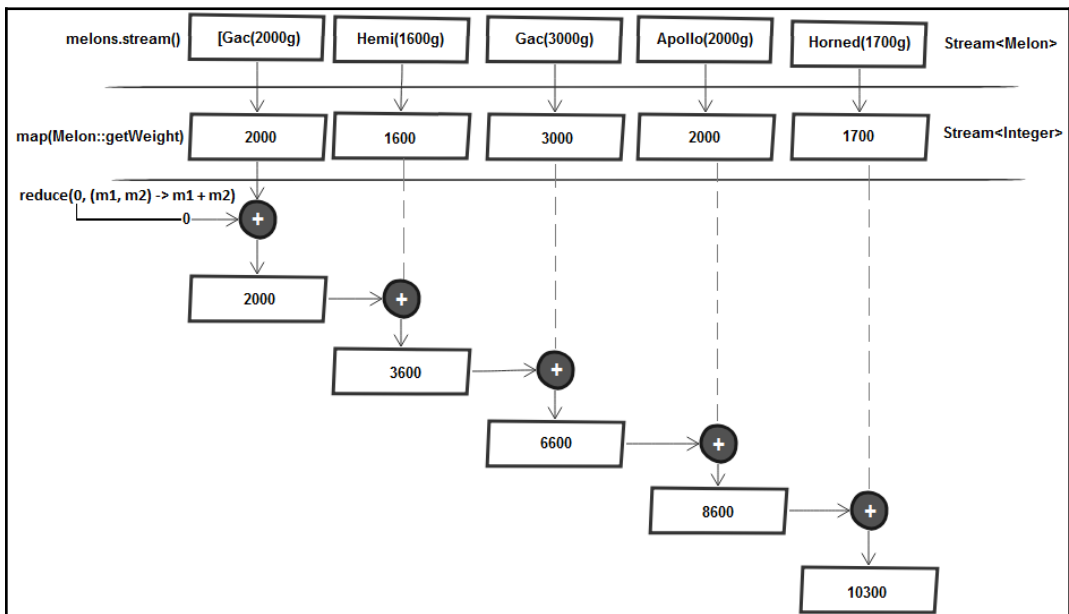
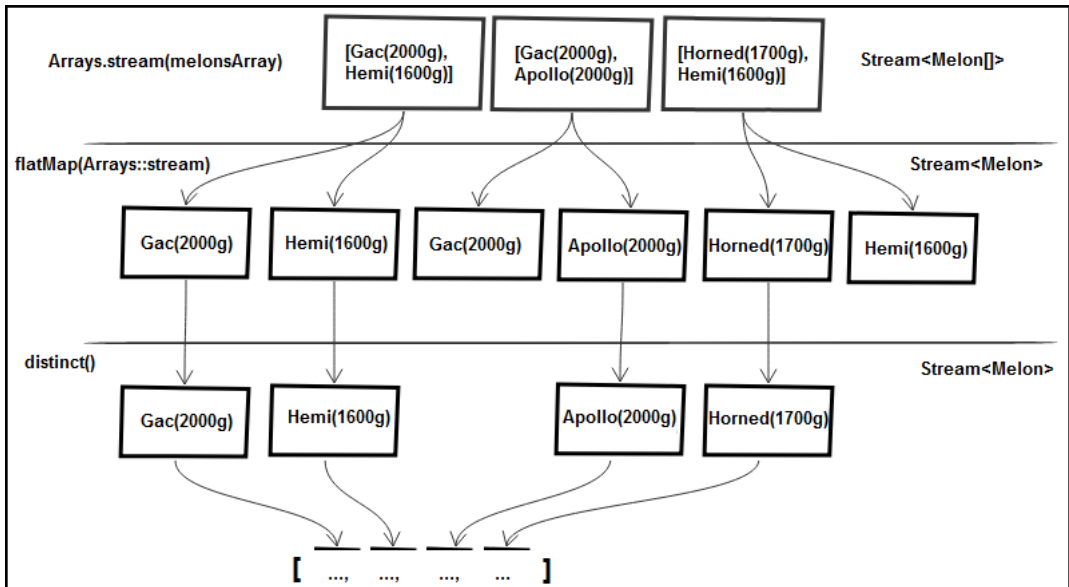
After:

```
stream(): anna
stream(): bob
stream(): christian
filter(): christian
map(): CHRISTIAN
stream(): null
```

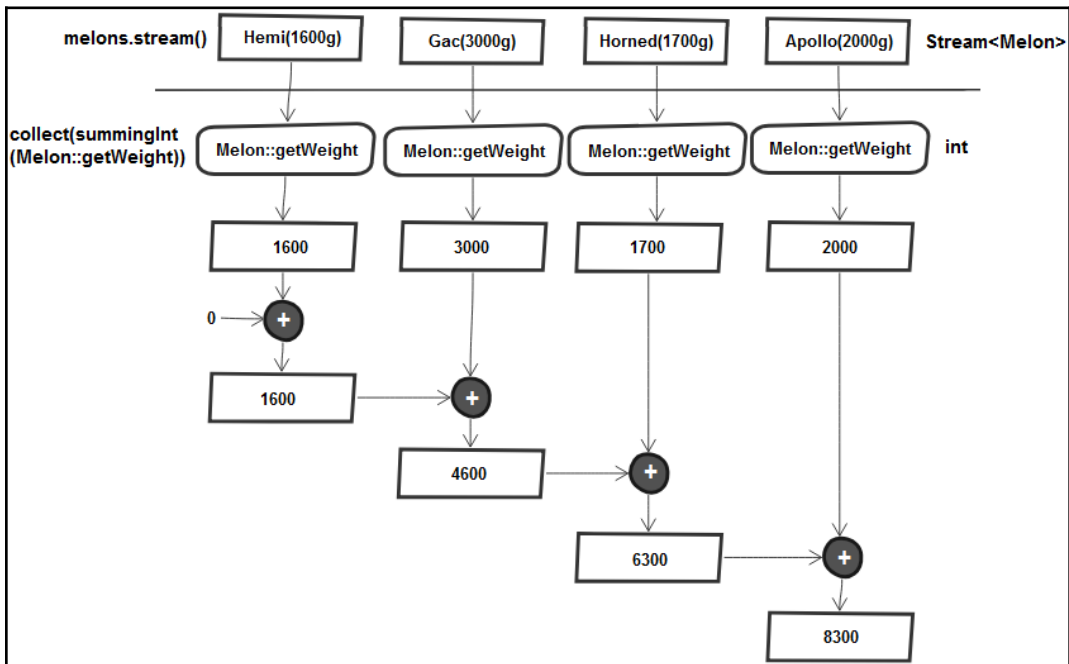
```
Exception in thread "main" java.lang.NullPointerException
  at modern.challenge.Main.lambda$main$1 (Main.java:16)
  ...
```

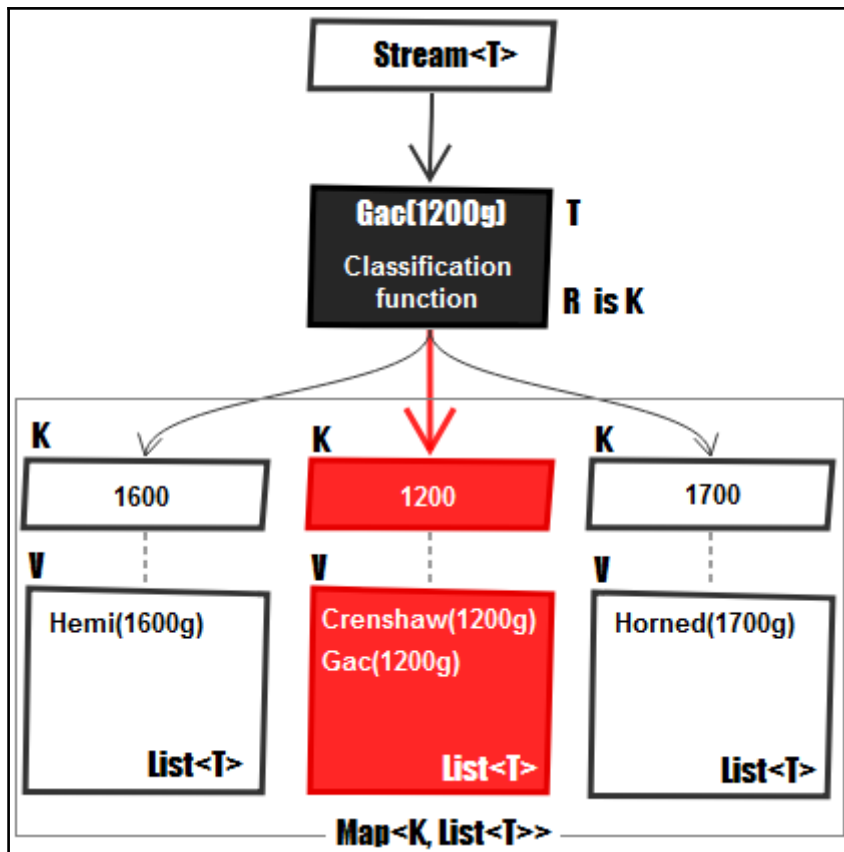




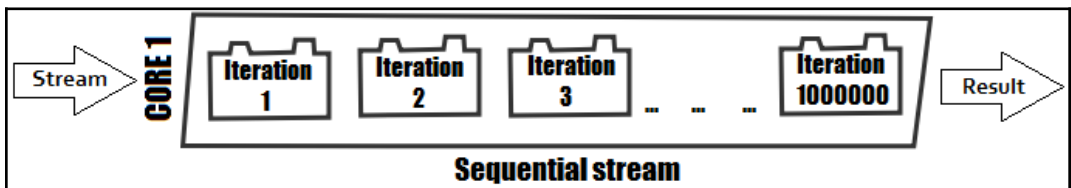
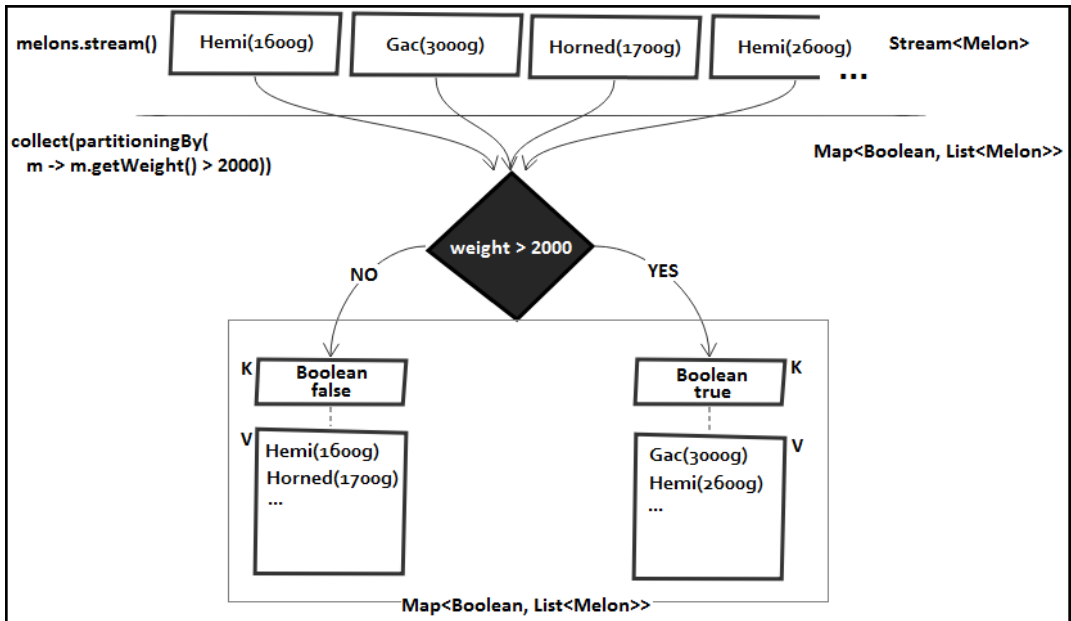


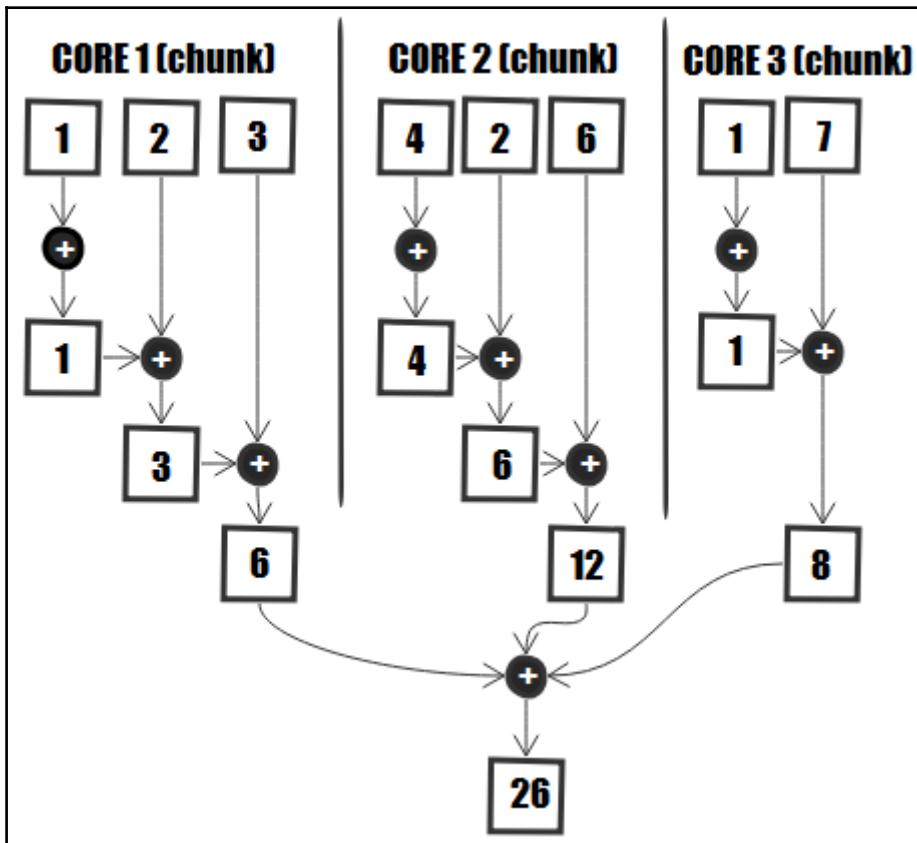
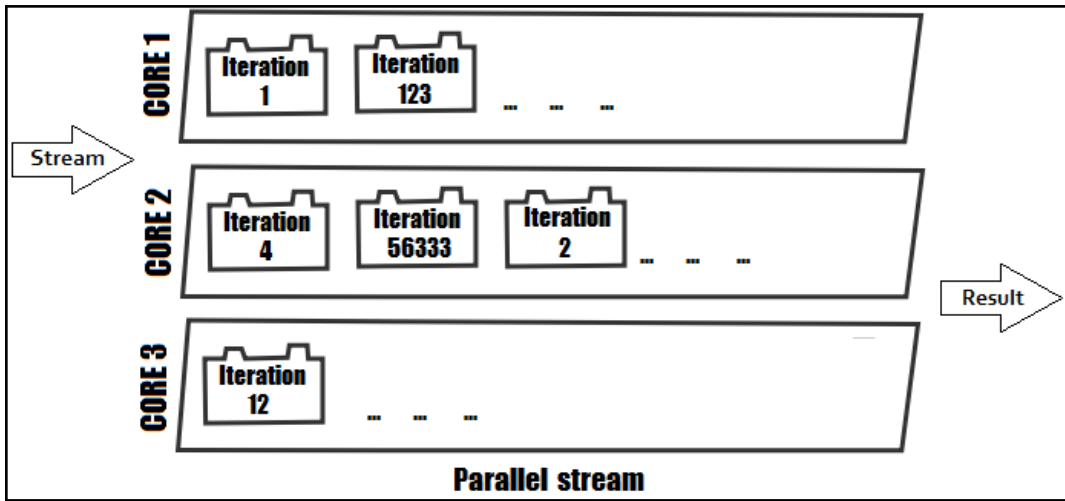
$$H = \frac{n}{\frac{1}{x_1} + \frac{1}{x_2} + \dots + \frac{1}{x_n}} = \frac{n}{\sum_{i=1}^n \frac{1}{x_i}} = \left(\frac{\sum_{i=1}^n x_i^{-1}}{n} \right)^{-1}$$

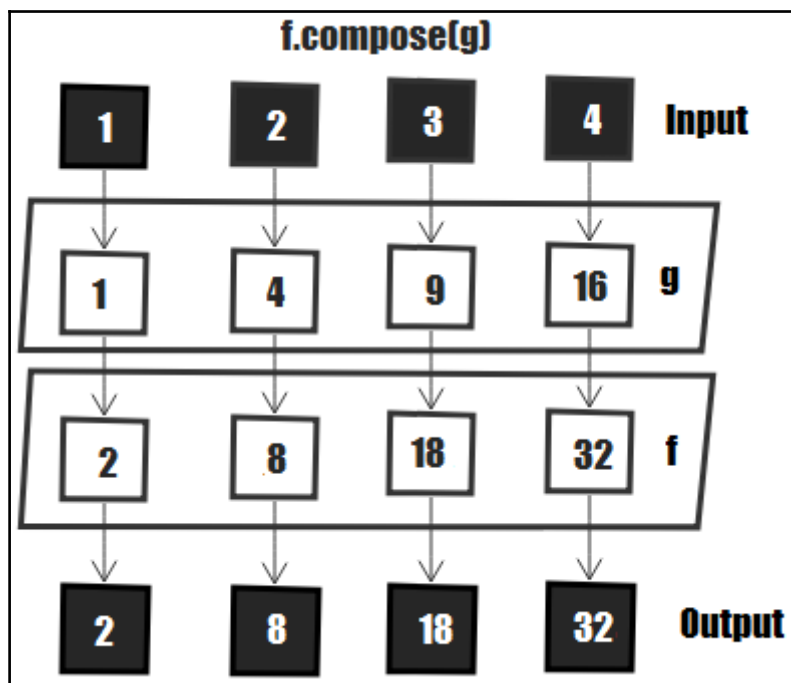
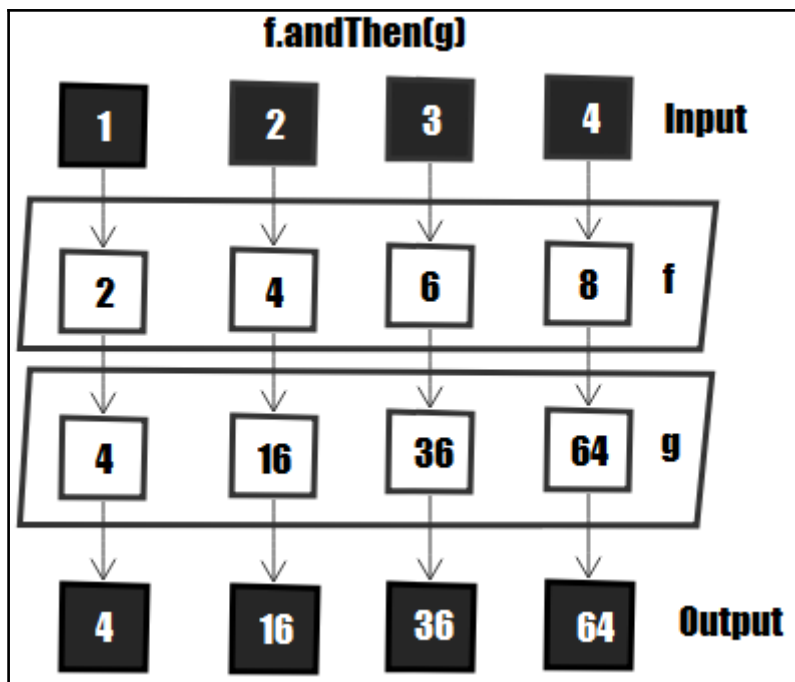




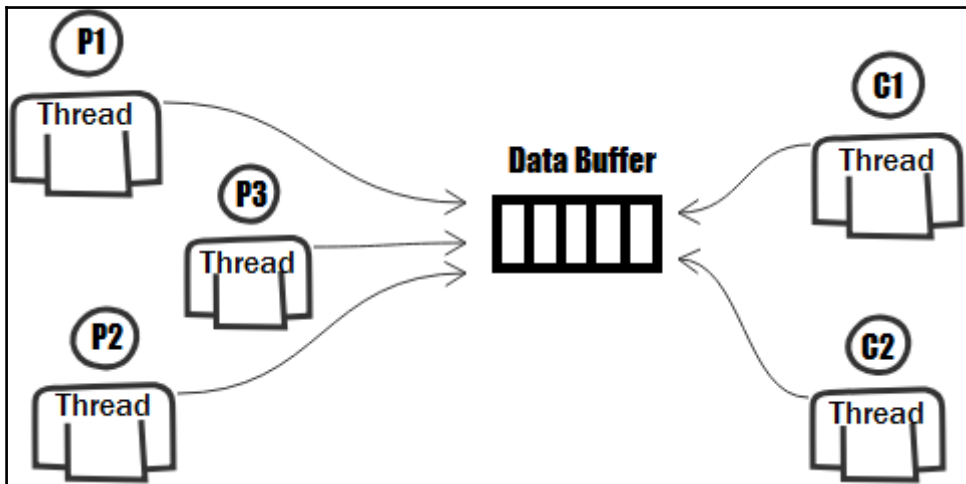
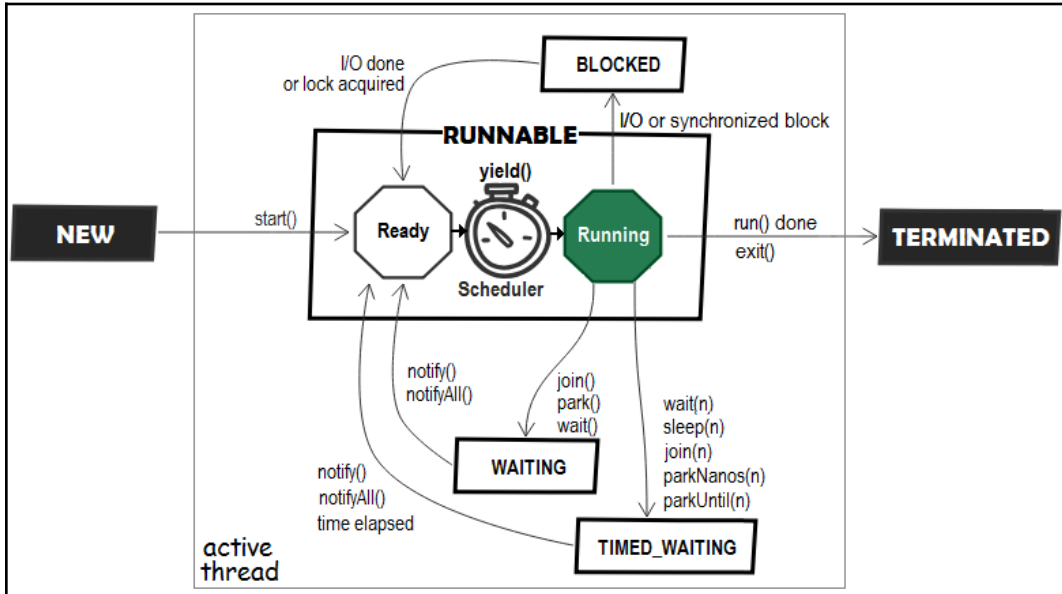
sugar weight	LOW	MEDIUM	HIGH	UNKNOWN
2600		Apollo Cantaloupe	Hemi	
3600		Cantaloupe		
1200	Gac		Crenshaw Horned	
1600				Hemi
3000	Gac			

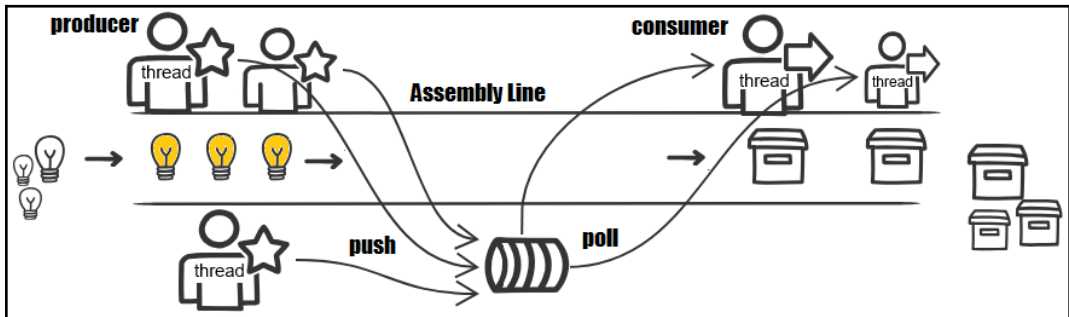
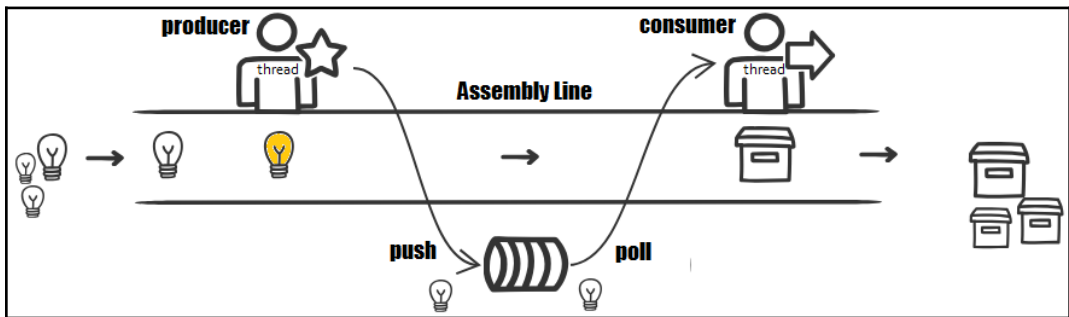
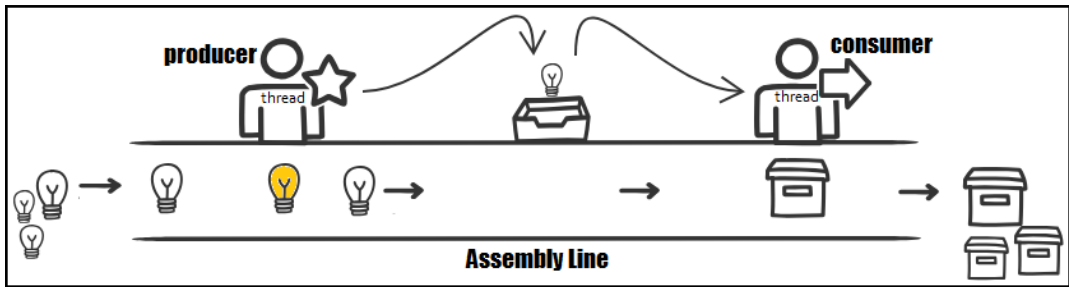


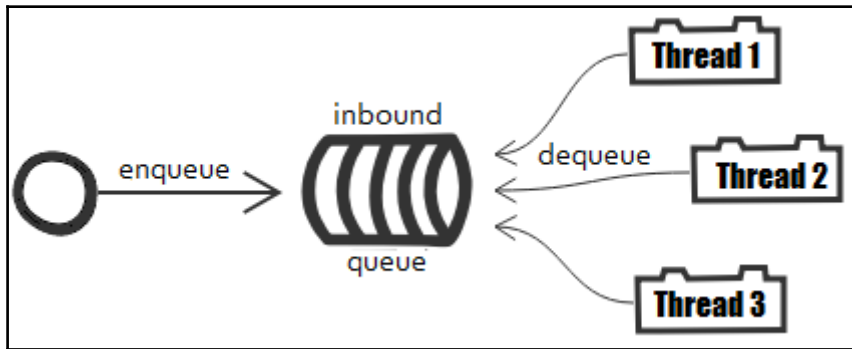
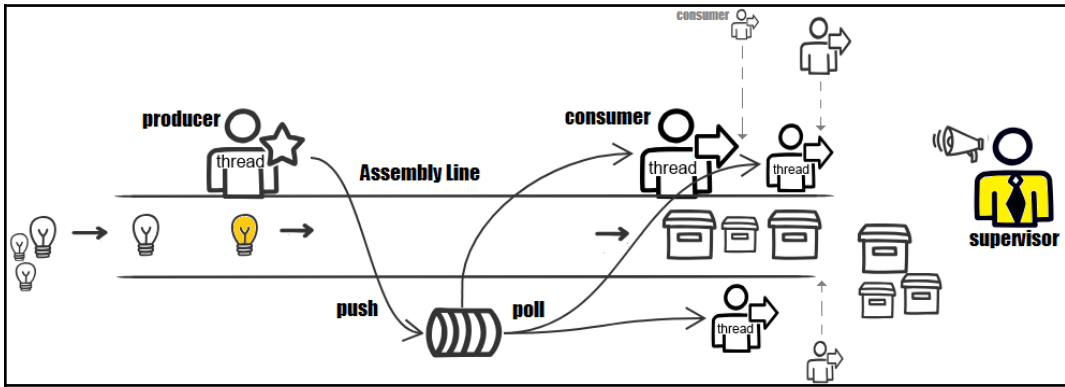
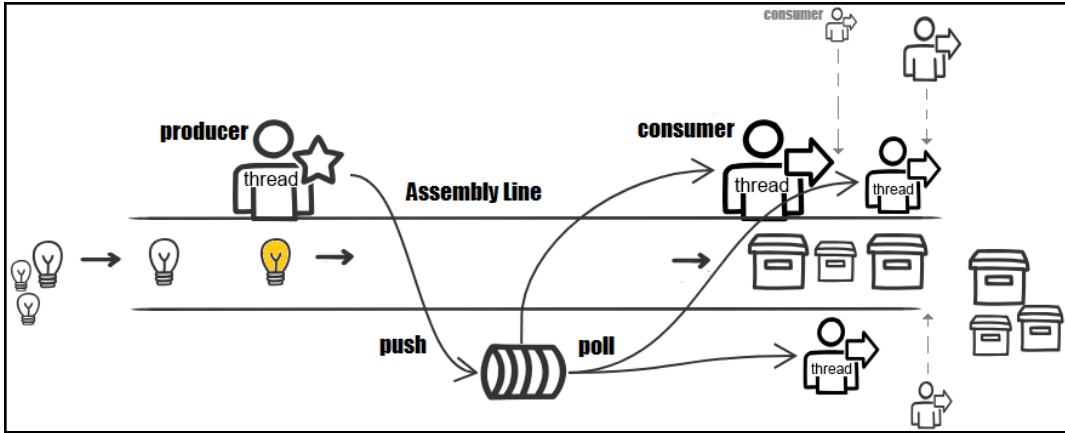


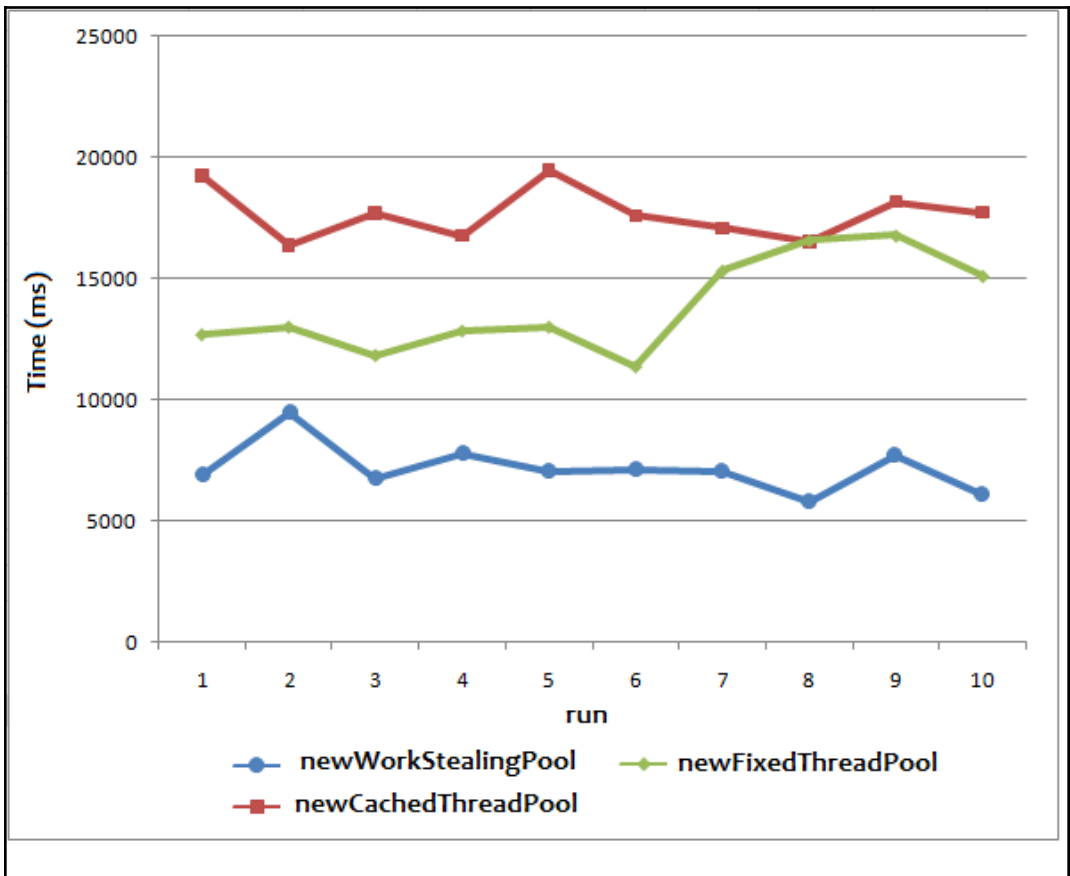
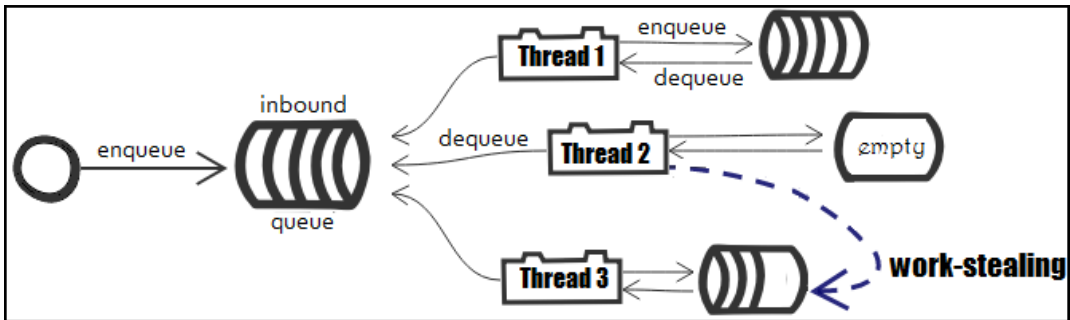


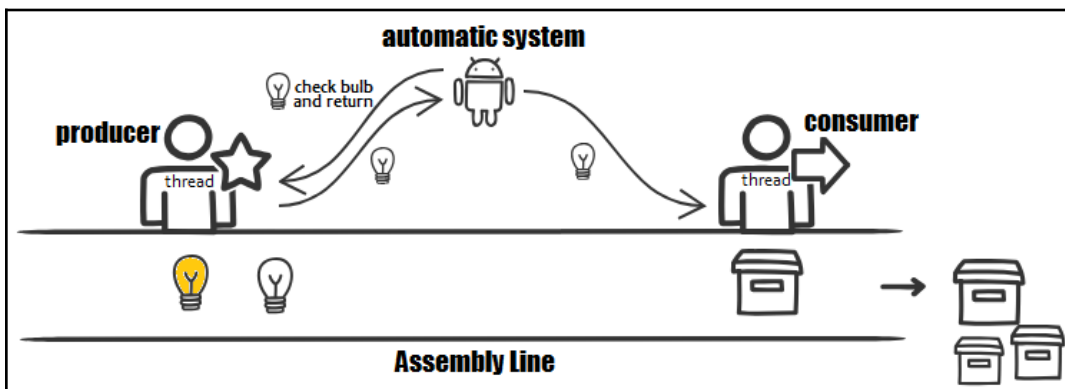
Chapter 10: Concurrency - Thread Pools, Callables, and Synchronizers

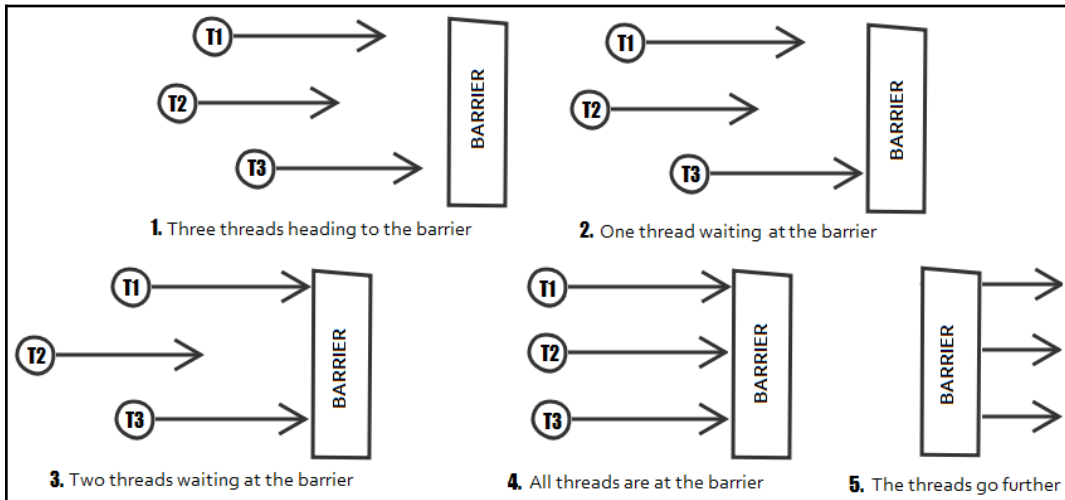
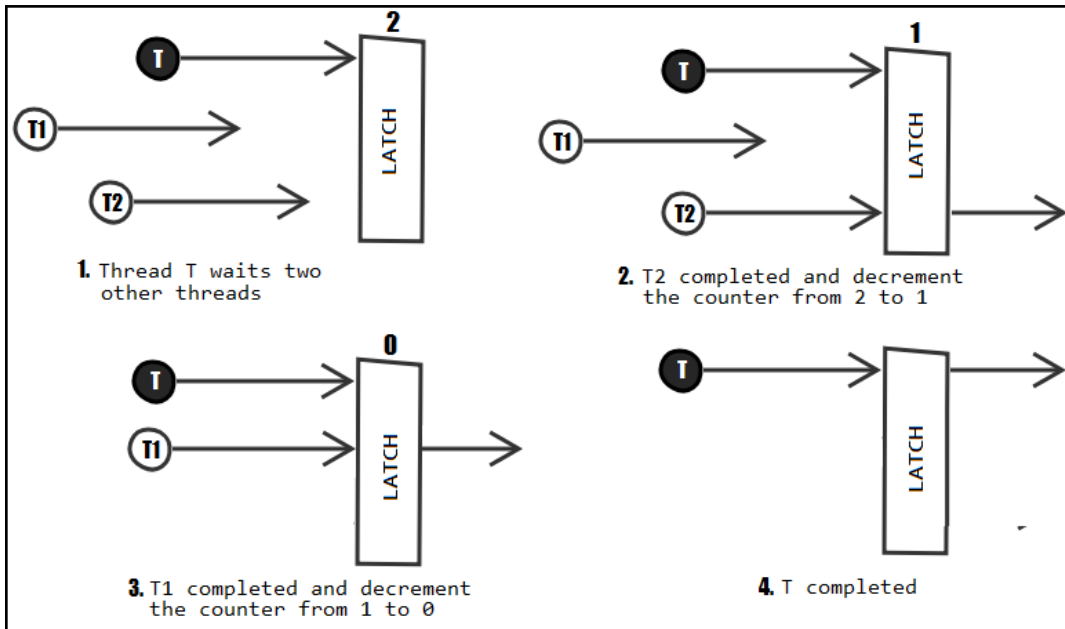


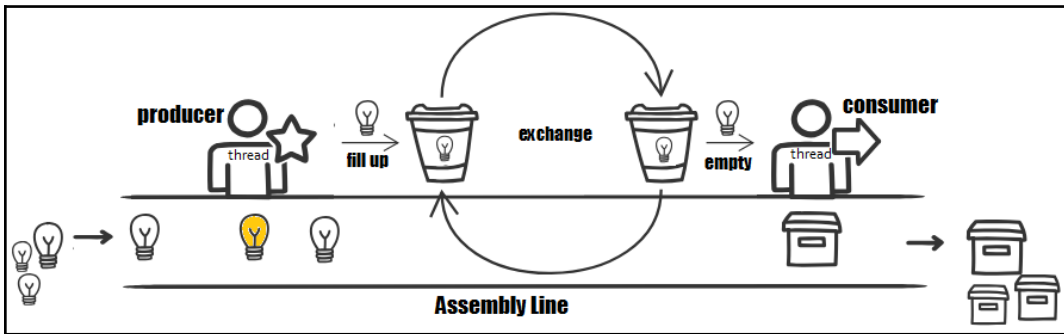
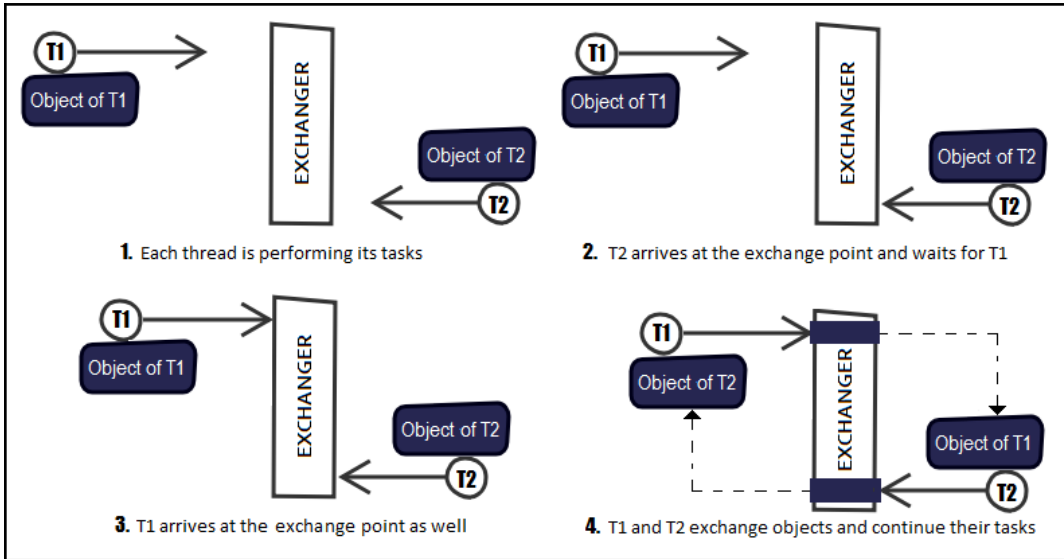


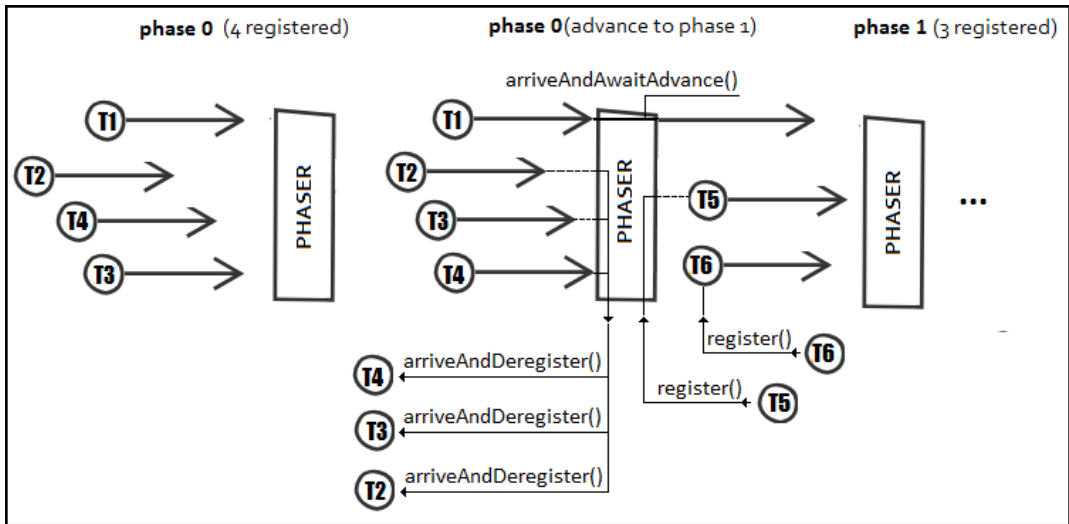




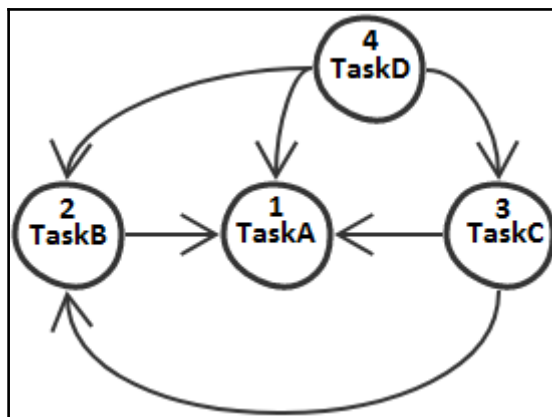
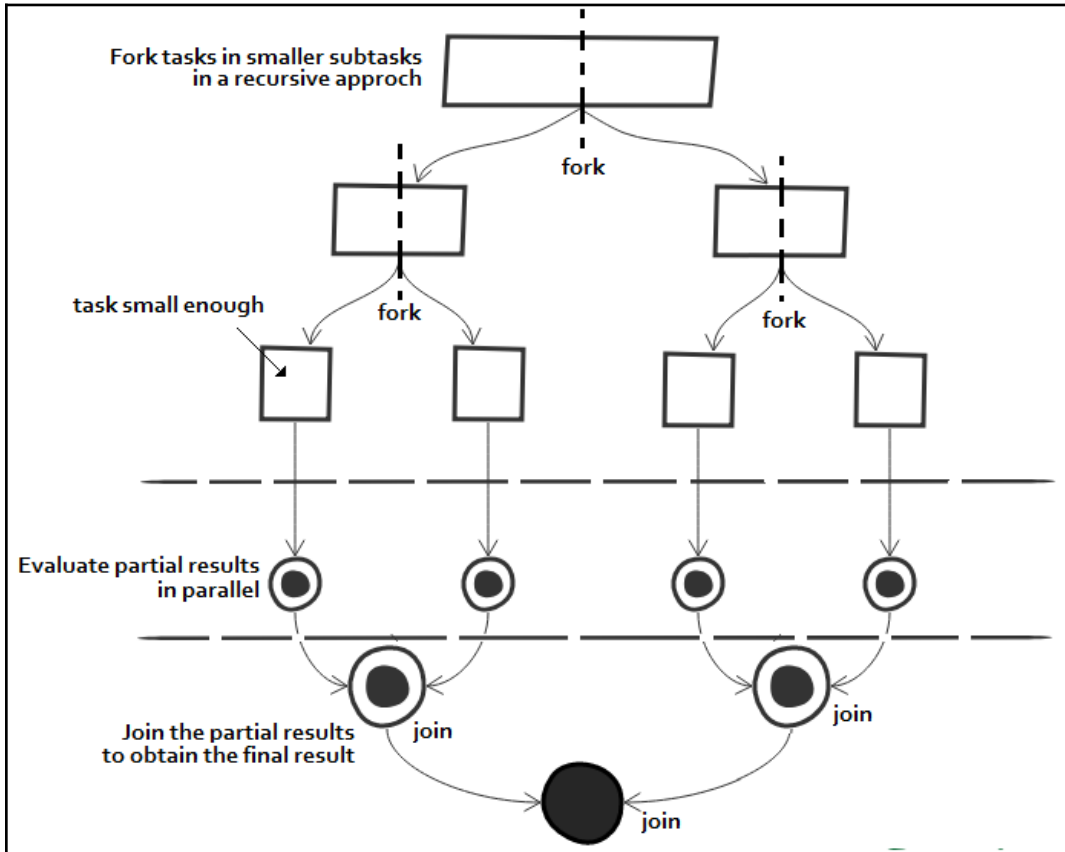








Chapter 11: Concurrency - Deep Dive



```

CompletableFuture.supplyAsync(() -> {
    // Code prone to exception
    return "result1";
}).thenApply(r1 -> {
    // Code prone to exception
    return "result2";
}).thenApply(r2 -> {
    // Code prone to exception
    return "result3";
}).thenAccept(r3 -> {
    // Code prone to exception
});

```

Exception in supplyAsync()

```

CompletableFuture.supplyAsync(() -> {
    // Code prone to exception
    return "result1";
}).thenApply(r1 -> {
    // Code prone to exception
    return "result2";
}).thenApply(r2 -> {
    // Code prone to exception
    return "result3";
}).thenAccept(r3 -> {
    // Code prone to exception
});

```

Exception in 1st thenApply()

```

CompletableFuture.supplyAsync(() -> {
    // Code prone to exception
    return "result1";
}).thenApply(r1 -> {
    // Code prone to exception
    return "result2";
}).thenApply(r2 -> {
    // Code prone to exception
    return "result3";
}).thenAccept(r3 -> {
    // Code prone to exception
});

```

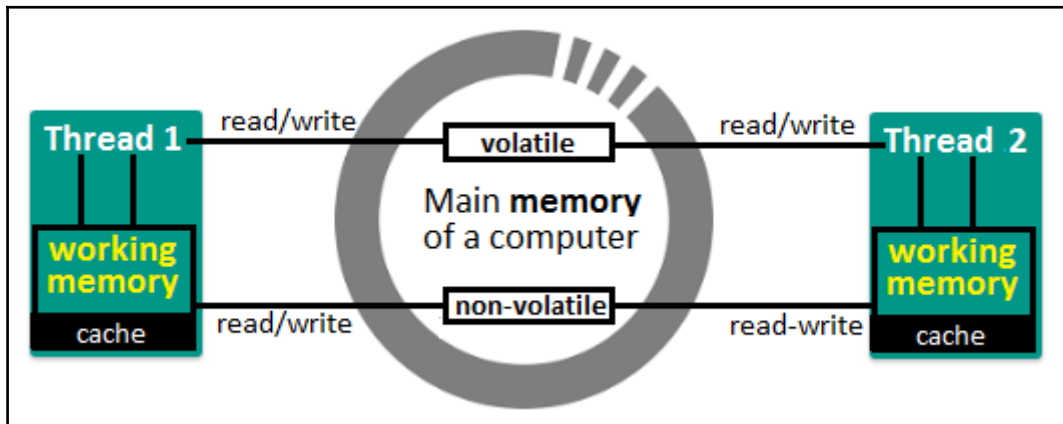
Exception in 2nd thenApply()

```

CompletableFuture.supplyAsync(() -> {
    // Code prone to exception
    return "result1";
}).thenApply(r1 -> {
    // Code prone to exception
    return "result2";
}).thenApply(r2 -> {
    // Code prone to exception
    return "result3";
}).thenAccept(r3 -> {
    // Code prone to exception
});

```

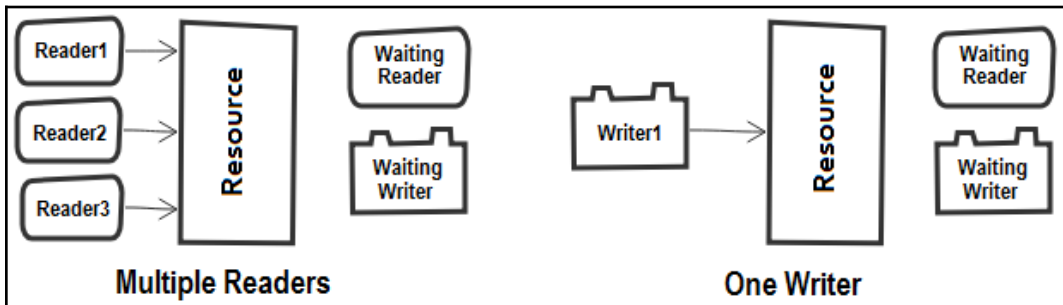
Exception in thenAccept()

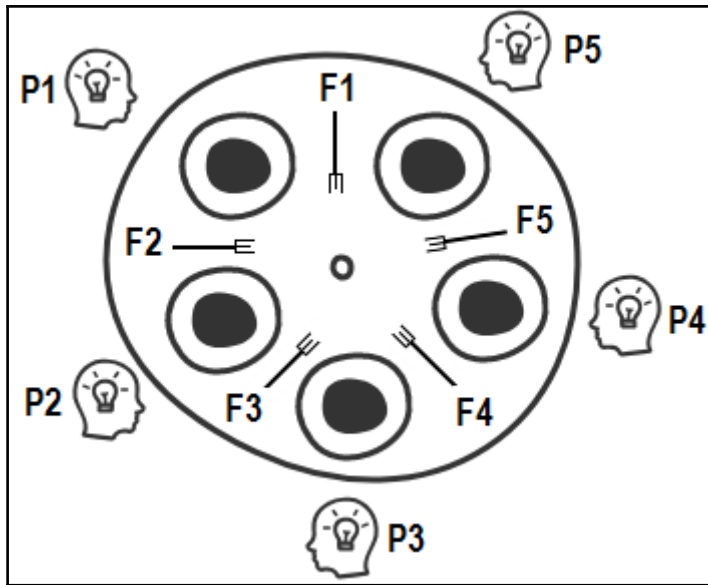


newCondition

```
Lock/ReentrantLock lock = new ReentrantLock();
Condition condition = lock.newCondition();
public void execute() throws InterruptedException {
    lock.lock();
    try {
        while/if(some_condition) {
            condition.await();
        }
    } finally {
        lock.unlock();
    }
}
lock.lock();
try {
    condition.signal(All)();
} finally {
    lock.unlock();
}
```

When `await()` is called the thread releases the lock. After getting the signal to continue the thread must acquire the lock again.

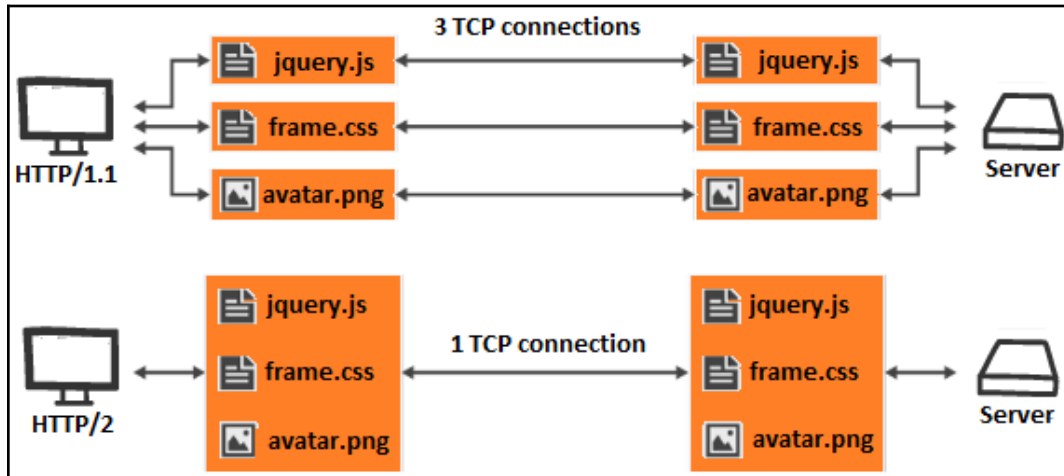




Chapter 12: Optional

No images

Chapter 13: The HTTP Client and WebSocket APIs



```

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Lorem Ipsum Generator
--779d334bbfa749fdb1f4d115cd18a0cd
Content-Disposition: form-data; name="filefield"; filename="figure.png"
Content-Type: image/png






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```

part 1

part 2

 godocs	5/16/2019 10:26 AM	JScript Script File	18 KB
 index	5/16/2019 10:26 AM	Chrome HTML Do...	66 KB
 jquery.min	5/16/2019 10:26 AM	JScript Script File	92 KB
 playground	5/16/2019 10:26 AM	JScript Script File	15 KB
 style	5/16/2019 10:26 AM	Cascading Style S...	14 KB