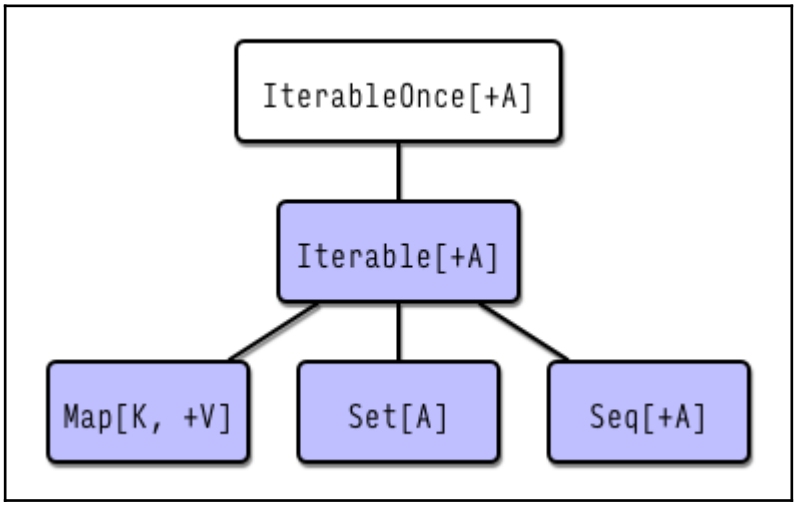
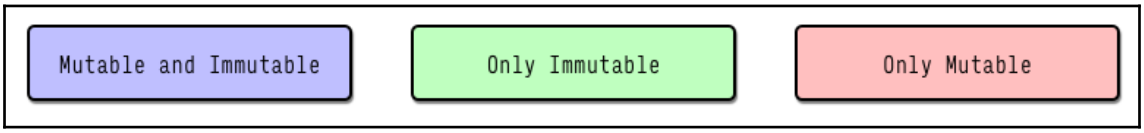
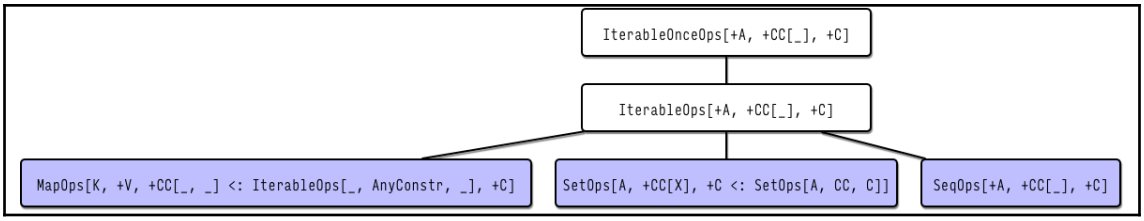
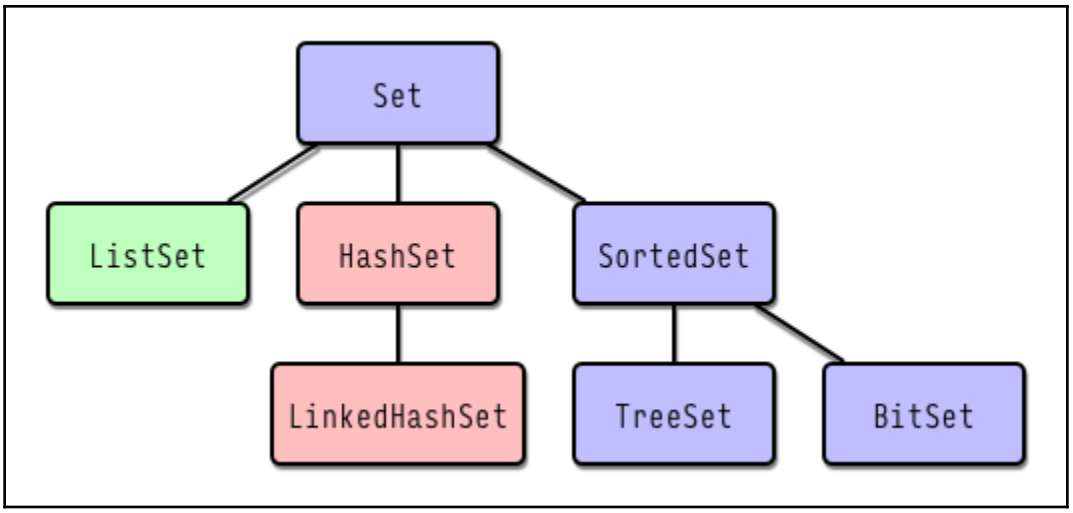
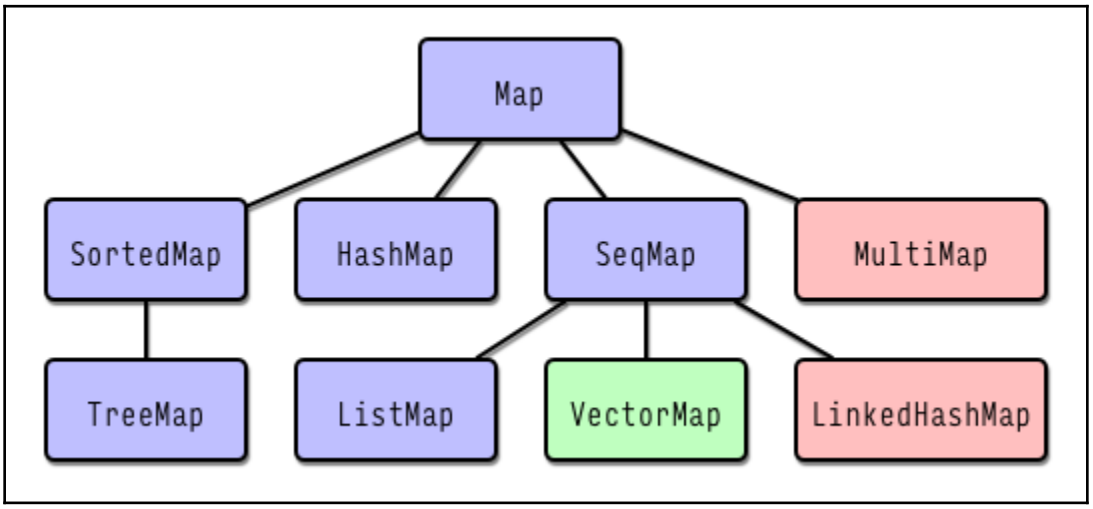
# Chapter 1: An Introduction to Scala 2.13

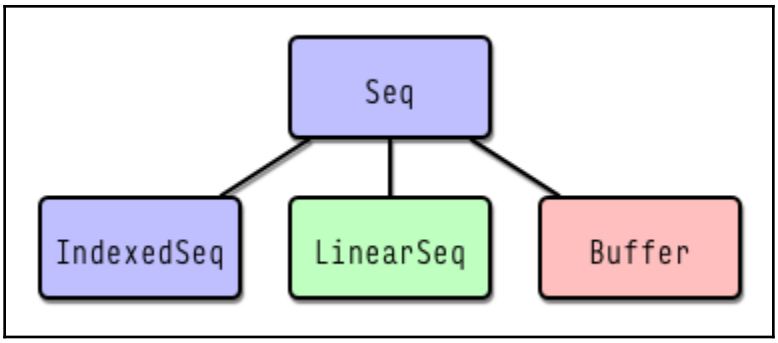


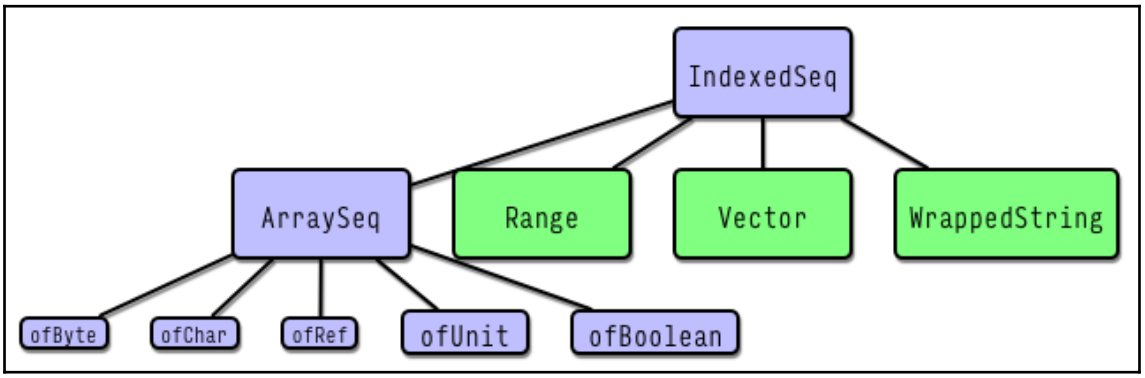



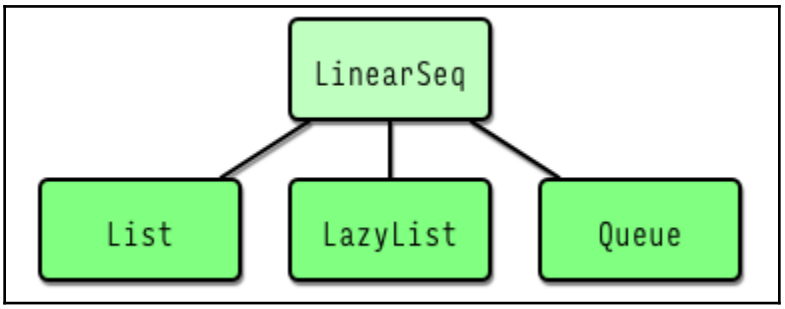



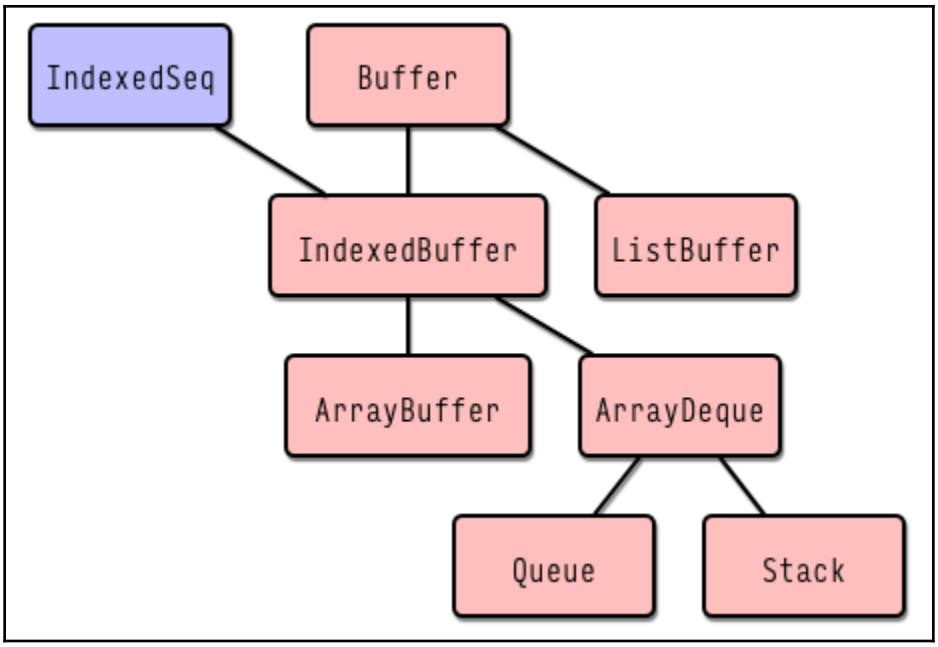

Set
ListSet
HashSet
SortedSet
LinkedHashSet
TreeSet
BitSet


Map
SortedMap
HashMap
SeqMap
MultiMap
TreeMap
ListMap
VectorMap
LinkedHashMap

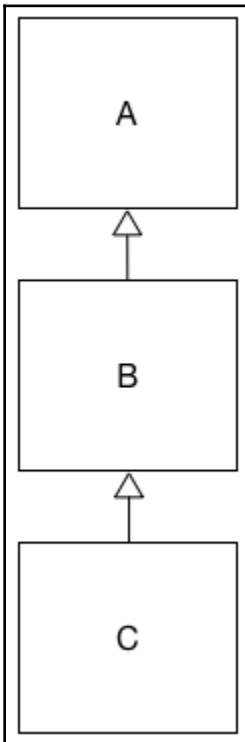

Seq
IndexedSeq
LinearSeq
Buffer


IndexedSeq
ArraySeq
Range
Vector
WrappedString
ofByte
ofChar
ofRef
ofUnit
ofBoolean

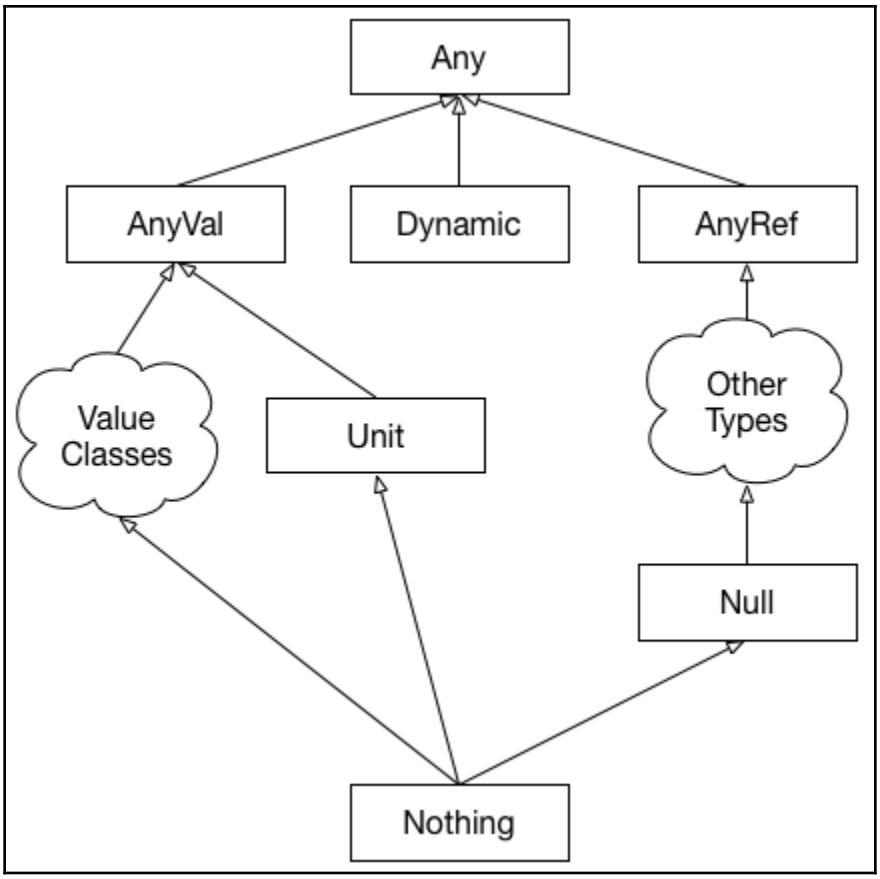

LinearSeq
List
LazyList
Queue


IndexedSeq
Buffer
IndexedBuffer
ListBuffer
ArrayBuffer
ArrayDeque
Queue
Stack

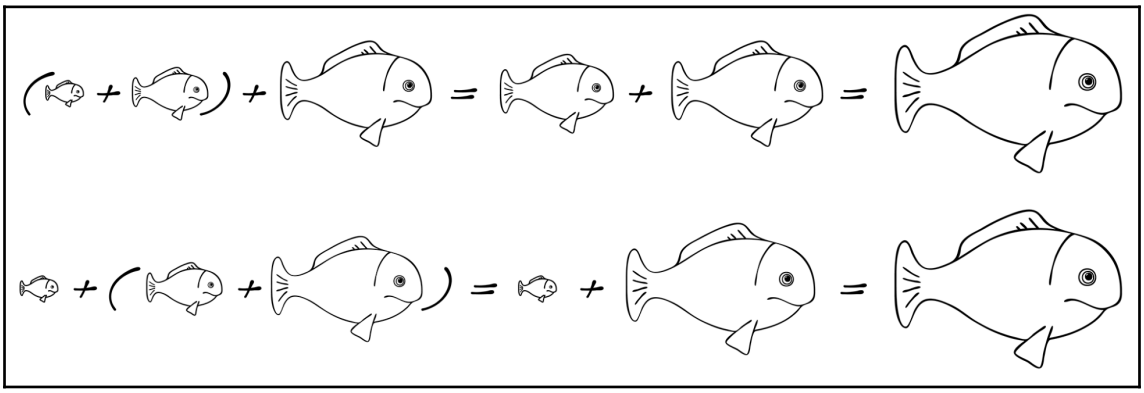
# Chapter 2: Understanding Types in Scala

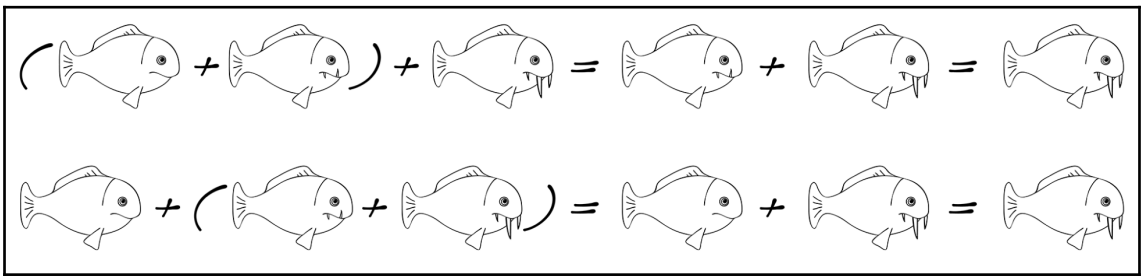


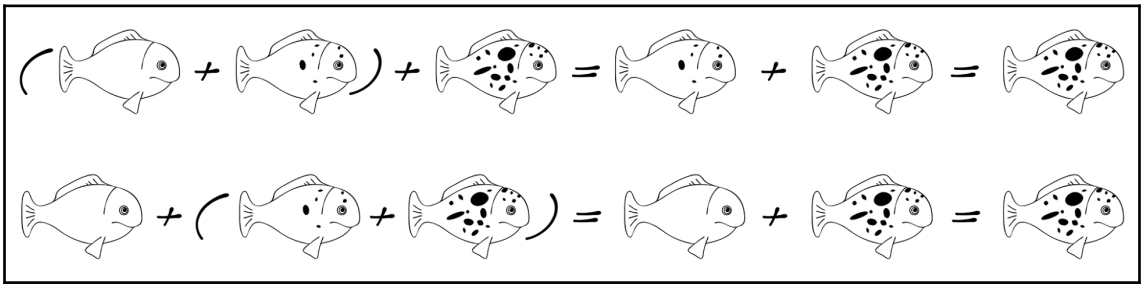

```scala
object Constraints {
  trait A
  trait B extends A
  trait C extends B

  trait bounds {
    type LOWER >: B
    type UPPER <: B
  }
  trait boundsA extends bounds {
    override type LOWER = A
    override type UPPER = A // compile error
  }
  trait boundsB extends bounds {
    override type LOWER = B
    override type UPPER = B
  }
  trait boundsC extends bounds {
    override type LOWER = C // compile error
    override type UPPER = C
  }
}
```

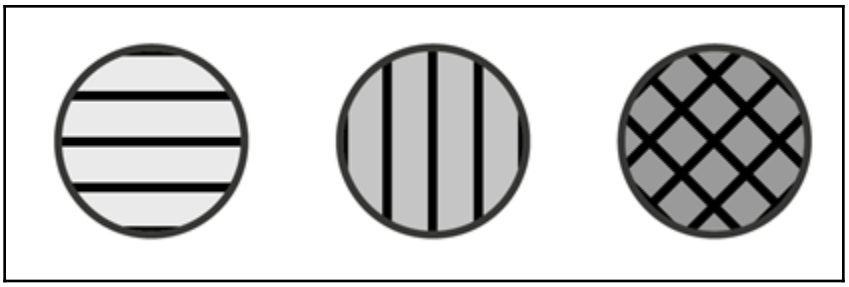

Any
AnyVal
Dynamic
AnyRef
Value Classes
Unit
Other Types
Null
Nothing

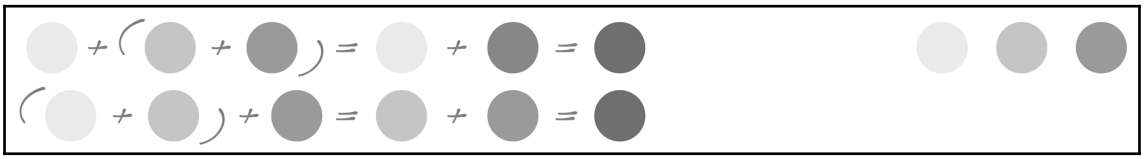
# Chapter 7: Understanding Algebraic Structures

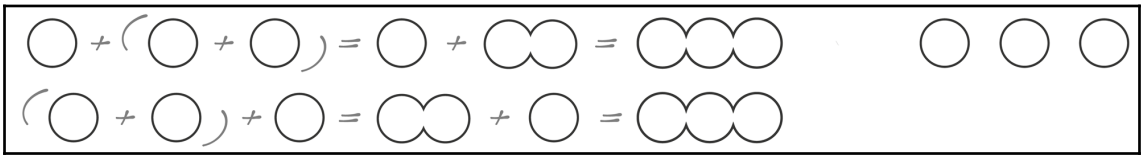


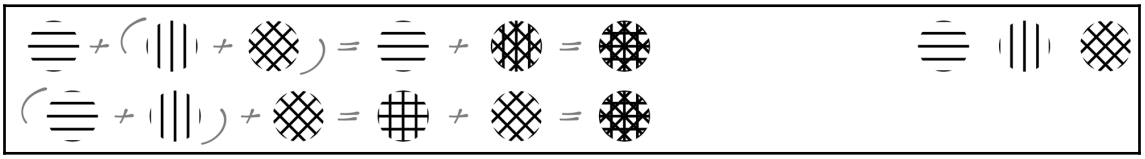




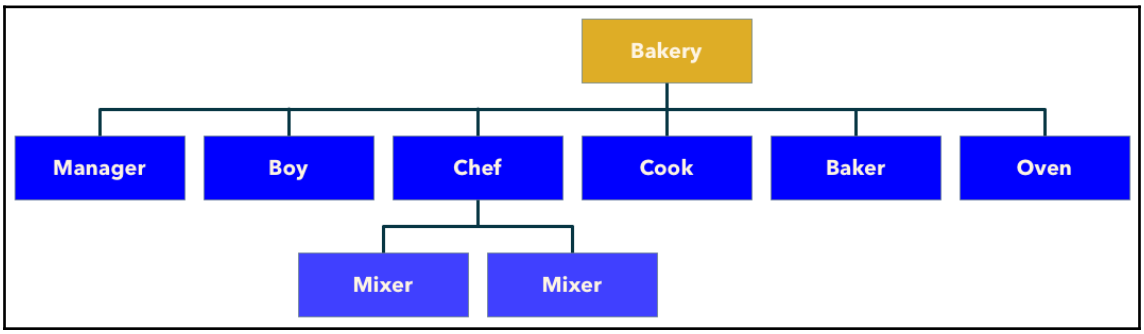


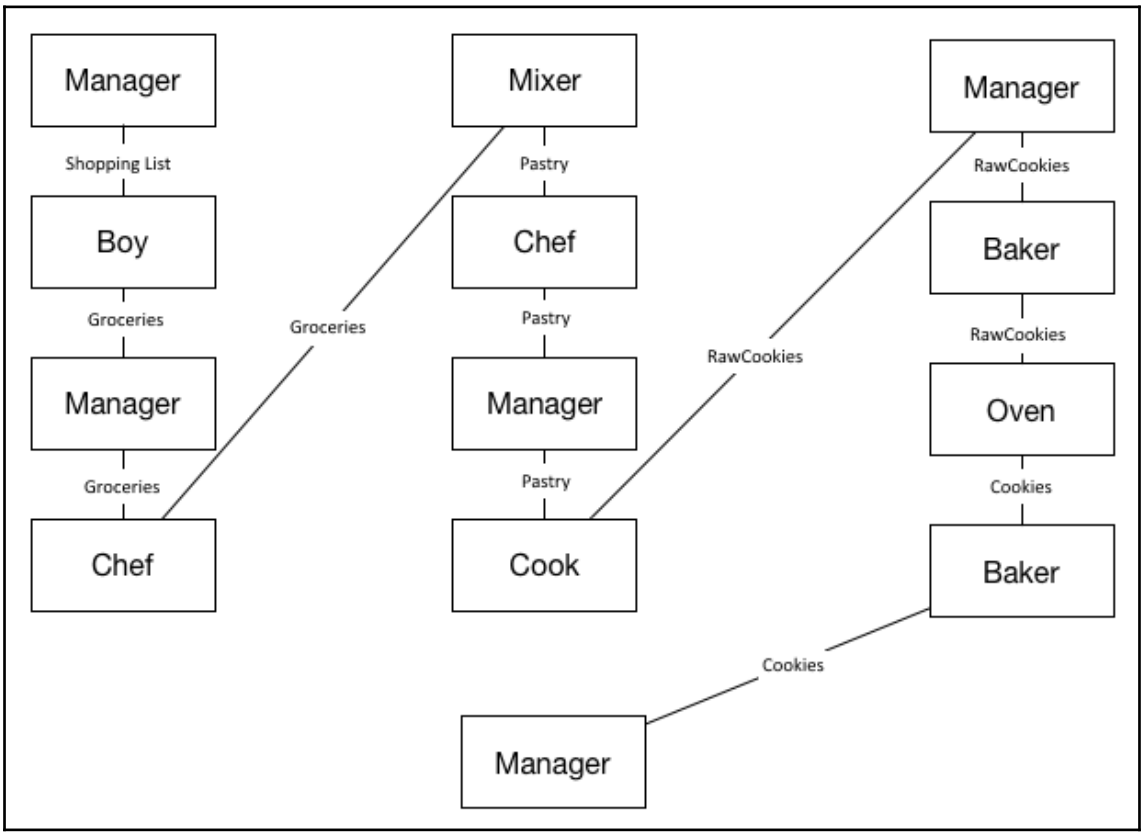


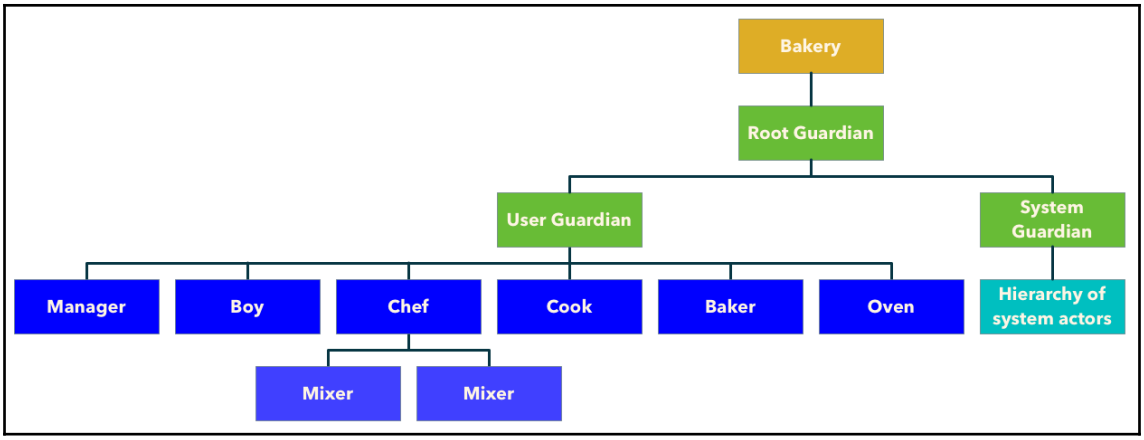


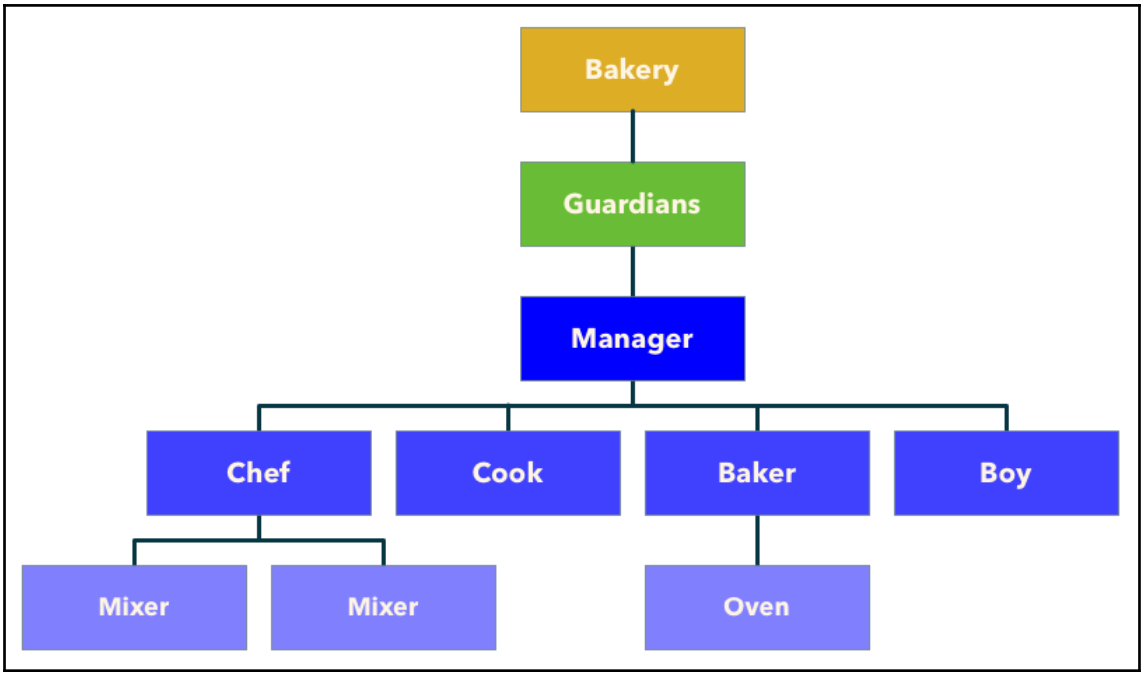


# Chapter 11: An Introduction to the Akka and Actor Models




Bakery
Root Guardian
User Guardian
System Guardian
Manager
Boy
Chef
Cook
Baker
Oven
Hierarchy of system actors
Mixer
Mixer


Bakery
Guardians
Manager
Chef
Cook
Baker
Boy
Mixer
Mixer
Oven

```
slasch@packt:~$ cd Learn-Scala---Fundamentals-of-Scala-2.13/ch11
slasch@packt:~/Learn-Scala---Fundamentals-of-Scala-2.13/ch11$ sbt
[info] Loading project definition from /home/slasch/Learn-Scala--
-Fundamentals-of-Scala-2.13/ch11/project
[info] Loading settings for project ch11 from build.sbt ...
[info] Set current project to akka-bakery (in build file:/home/sl
asch/Learn-Scala---Fundamentals-of-Scala-2.13/ch11/)
[warn] sbt server could not start because there's another instanc
e of sbt running on this build.
[warn] Running multiple instances is unsupported
sbt:akka-bakery> run
[warn] Multiple main classes detected.  Run 'show discoveredMainC
lasses' to see the list

Multiple main classes detected, select one to run:

 [1] ch11.Bakery
 [2] ch11.Store

Enter number:
```

Enter "run" command

Enter "2" to start Store

```
slasch@packt:~$ cd Learn-Scala---Fundamentals-of-Scala-2.13/ch11
slasch@packt:~/Learn-Scala---Fundamentals-of-Scala-2.13/ch11$ sbt
[info] Loading project definition from /home/slasch/Learn-Scala--
-Fundamentals-of-Scala-2.13/ch11/project
[info] Loading settings for project ch11 from build.sbt ...
[info] Set current project to akka-bakery (in build file:/home/sl
asch/Learn-Scala---Fundamentals-of-Scala-2.13/ch11/)
[info] sbt server started at local:///home/slasch/.sbt/1.0/server
/7bde7a4d263e73d9ff87/sock
sbt:akka-bakery> [info] new client connected: network-1
run
[warn] Multiple main classes detected.  Run 'show discoveredMainC
lasses' to see the list

Multiple main classes detected, select one to run:

 [1] ch11.Bakery
 [2] ch11.Store

Enter number: 2

[info] Running ch11.Store
[INFO] [09/29/2018 19:54:17.938] [run-main-0] [akka.remote.Remoti
ng] Starting remoting
[INFO] [09/29/2018 19:54:18.408] [run-main-0] [akka.remote.Remoti
ng] Remoting started; listening on addresses :[akka.tcp://Store@1
27.0.0.1:2553]
[INFO] [09/29/2018 19:54:18.412] [run-main-0] [akka.remote.Remoti
ng] Remoting now listens on addresses: [akka.tcp://Store@127.0.0.
1:2553]
```

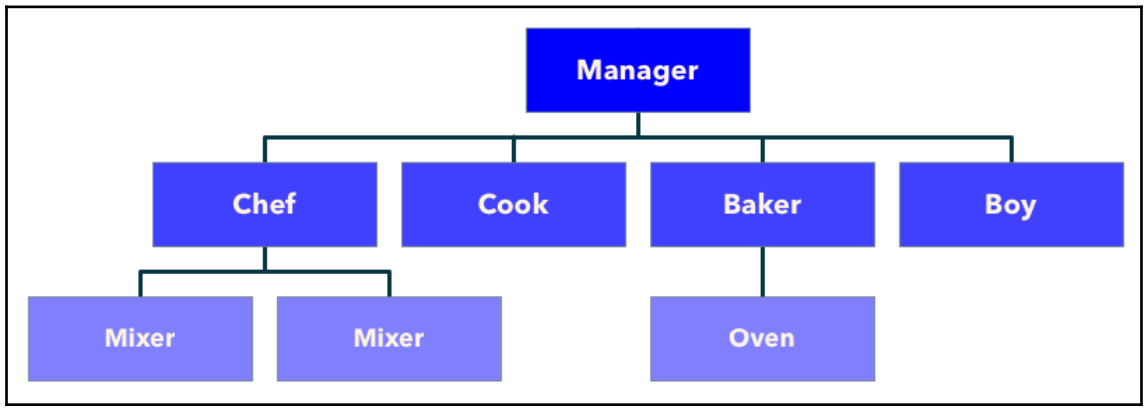
```
slasch@packt:~$ cd Learn-Scala---Fundamentals-of-Scala-2.13/ch11
slasch@packt:~/Learn-Scala---Fundamentals-of-Scala-2.13/ch11$ sbt
[info] Loading project definition from /home/slasch/Learn-Scala--
-Fundamentals-of-Scala-2.13/ch11/project
[info] Loading settings for project ch11 from build.sbt ...
[info] Set current project to akka-bakery (in build file:/home/sl
asch/Learn-Scala---Fundamentals-of-Scala-2.13/ch11/)
[warn] sbt server could not start because there's another instanc
e of sbt running on this build.
[warn] Running multiple instances is unsupported
sbt:akka-bakery> run
[warn] Multiple main classes detected.  Run 'show discoveredMainC
lasses' to see the list

Multiple main classes detected, select one to run:

 [1] ch11.Bakery
 [2] ch11.Store

Enter number: 1
```

Enter "1" to start Shop

```
[info] Running ch11.Bakery
[INFO] [09/29/2018 19:54:31.443] [run-main-0] [akka.remote.Remoti
ng] Starting remoting
[INFO] [09/29/2018 19:54:31.921] [run-main-0] [akka.remote.Remoti
ng] Remoting started; listening on addresses :[akka.tcp://Bakery@
127.0.0.1:2552]
[INFO] [09/29/2018 19:54:31.922] [run-main-0] [akka.remote.Remoti
ng] Remoting now listens on addresses: [akka.tcp://Bakery@127.0.0
.1:2552]
[WARN] [SECURITY][09/29/2018 19:54:33.850] [Bakery-akka.remote.de
fault-remote-dispatcher-6] [akka.serialization.Serialization(akka
://Bakery)] Using the default Java serializer for class [ch11.Man
ager$ShoppingList] which is not recommended because of performanc
e implications. Use another serializer or disable this warning us
ing the setting 'akka.actor.warn-about-java-serializer-usage'
```

```
slasch@packt:~/Learn-Scala---Fundamentals-of-Scala-2.13/ch11$ sbt
[info] Loading project definition from /home/slasch/Learn-Scala--
-Fundamentals-of-Scala-2.13/ch11/project
[info] Loading settings for project ch11 from build.sbt ...
[info] Set current project to akka-bakery (in build file:/home/sl
asch/Learn-Scala---Fundamentals-of-Scala-2.13/ch11/)
[info] sbt server started at local:///home/slasch/.sbt/1.0/server
/7bde7a4d263e73d9ff87/sock
sbt:akka-bakery> [info] new client connected: network-1
run
[warn] Multiple main classes detected.  Run 'show discoveredMainC
lasses' to see the list

Multiple main classes detected, select one to run:

 [1] ch11.Bakery
 [2] ch11.Store

Enter number: 2

[info] Running ch11.Store
[INFO] [09/29/2018 19:54:17.938] [run-main-0] [akka.remote.Remoti
ng] Starting remoting
[INFO] [09/29/2018 19:54:18.408] [run-main-0] [akka.remote.Remoti
ng] Remoting started; listening on addresses :[akka.tcp://Store@1
27.0.0.1:2553]
[INFO] [09/29/2018 19:54:18.412] [run-main-0] [akka.remote.Remoti
ng] Remoting now listens on addresses: [akka.tcp://Store@127.0.0.
1:2553]
[WARN] [SECURITY][09/29/2018 19:54:34.080] [Store-akka.remote.def
ault-remote-dispatcher-6] [akka.serialization.Serialization(akka:
//Store)] Using the default Java serializer for class [ch11.Mixer
$Groceries] which is not recommended because of performance impli
cations. Use another serializer or disable this warning using the
_setting 'akka.actor.warn-about-java-serializer-usage'
```

# Chapter 12: Building Reactive Applications with Akka Typed



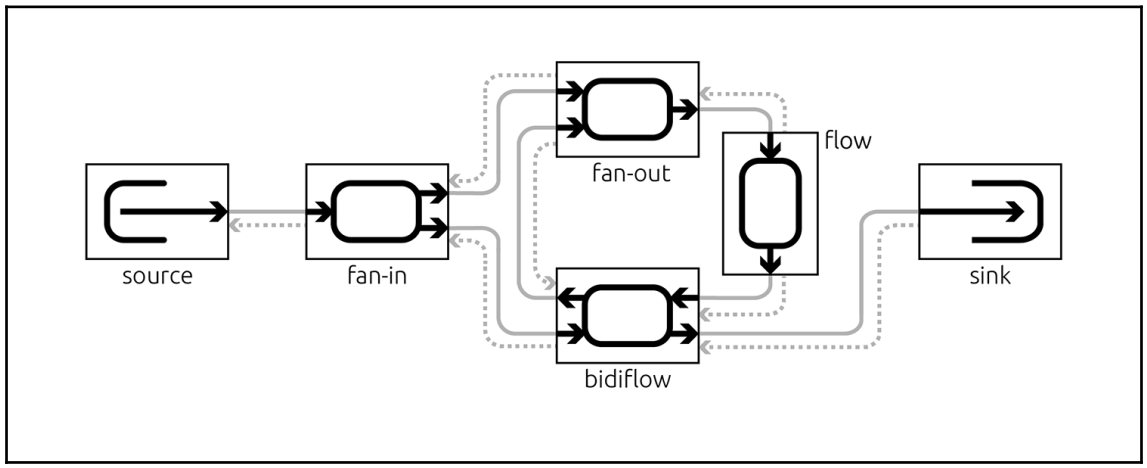

```
slasch@packt:~$ cd Learn-Scala---Fundamentals-of-Scala-2.13/ch12
slasch@packt:~/Learn-Scala---Fundamentals-of-Scala-2.13/ch12$ sbt
 "runMain ch12.Bakery"
```

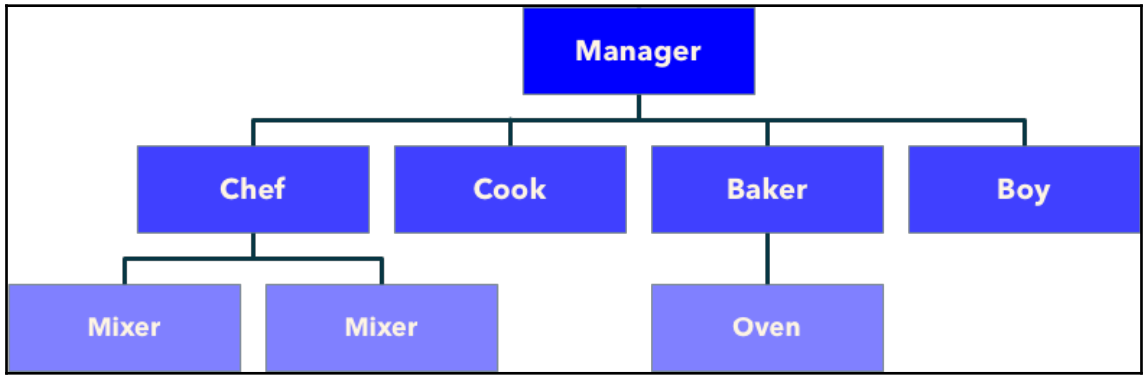
```
slasch@packt:~$ cd Learn-Scala---Fundamentals-of-Scala-2.13/ch12
slasch@packt:~/Learn-Scala---Fundamentals-of-Scala-2.13/ch12$ sbt
_"runMain ch12.Store"
```

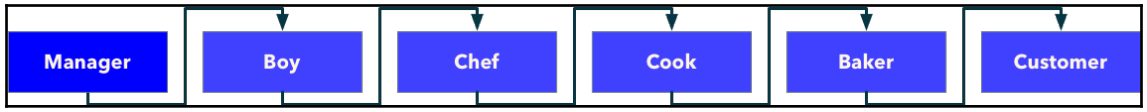
```
slasch@packt:~$ cd Learn-Scala---Fundamentals-of-Scala-2.13/ch12
slasch@packt:~/Learn-Scala---Fundamentals-of-Scala-2.13/ch12$ sbt
 "runMain ch12.Bakery"
[info] Loading project definition from /home/slasch/Learn-Scala---Fundamentals-of-Scala-2.13/ch12/project
[info] Loading settings for project ch12 from build.sbt ...
[info] Set current project to akka-typed-bakery (in build file:/home/slasch/Learn-Scala---Fundamentals-of-Scala-2.13/ch12/)
[warn] Multiple main classes detected.  Run 'show discoveredMainClasses' to see the list
[info] Packaging /home/slasch/Learn-Scala---Fundamentals-of-Scala-2.13/ch12/target/scala-2.12/akka-typed-bakery_2.12-1.0.jar ...
[info] Done packaging.
[info] Running ch12.Bakery
[INFO] [09/30/2018 14:01:25.137] [run-main-0] [akka.remote.Remoting] Starting remoting
[INFO] [09/30/2018 14:01:25.790] [run-main-0] [akka.remote.Remoting] Remoting started; listening on addresses :[akka.tcp://Typed-Bakery@127.0.0.1:2552]
[INFO] [09/30/2018 14:01:25.798] [run-main-0] [akka.remote.Remoting] Remoting now listens on addresses: [akka.tcp://Typed-Bakery@127.0.0.1:2552]
[INFO] [09/30/2018 14:01:25.904] [run-main-0] [akka.cluster.Cluster(akka://Typed-Bakery)] Cluster Node [akka.tcp://Typed-Bakery@127.0.0.1:2552] - Starting up, Akka version [2.5.17] ...
[INFO] [09/30/2018 14:01:26.072] [run-main-0] [akka.cluster.Cluster(akka://Typed-Bakery)] Cluster Node [akka.tcp://Typed-Bakery@127.0.0.1:2552] - Registered cluster JMX MBean [akka:type=Cluster]
[INFO] [09/30/2018 14:01:26.072] [run-main-0] [akka.cluster.Cluster(akka://Typed-Bakery)] Cluster Node [akka.tcp://Typed-Bakery@127.0.0.1:2552] - Started up successfully
[WARN] [09/30/2018 14:01:26.690] [New I/O boss #3] [NettyTransport(akka://Typed-Bakery)] Remote connection to [null] failed with java.net.ConnectException: Connection refused: /127.0.0.1:2553
[WARN] [09/30/2018 14:01:26.696] [Typed-Bakery-akka.remote.defaul
```

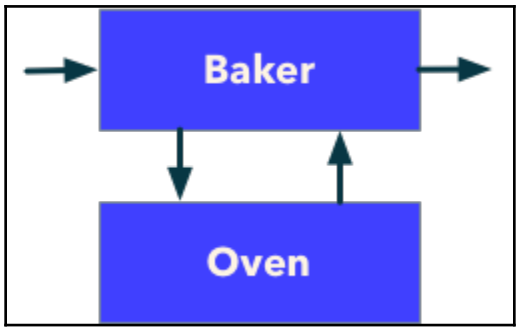
```
slasch@packt:~$ cd Learn-Scala---Fundamentals-of-Scala-2.13/ch12
slasch@packt:~/Learn-Scala---Fundamentals-of-Scala-2.13/ch12$ sbt
 "runMain ch12.Store"
[info] Loading project definition from /home/slasch/Learn-Scala---Fundamentals-of-Scala-2.13/ch12/project
[info] Loading settings for project ch12 from build.sbt ...
[info] Set current project to akka-typed-bakery (in build file:/home/slasch/Learn-Scala---Fundamentals-of-Scala-2.13/ch12/)
```

# Chapter 13: Basics of Akka Streams






```
slasch@packt:~$ cd Learn-Scala---Fundamentals-of-Scala-2.13/ch13
slasch@packt:~/Learn-Scala---Fundamentals-of-Scala-2.13/ch13$ sbt
 "runMain ch13.BakeryApp"
[info] Loading project definition from /home/slasch/Learn-Scala--
-Fundamentals-of-Scala-2.13/ch13/project
[info] Loading settings for project ch13 from build.sbt ...
[info] Set current project to akka-streams-bakery (in build file:
/home/slasch/Learn-Scala---Fundamentals-of-Scala-2.13/ch13/)
[warn] Multiple main classes detected.  Run 'show discoveredMainC
lasses' to see the list
[info] Running ch13.BakeryApp
[INFO] [09/30/2018 19:04:03.522] [run-main-0] [akka.remote.Remoti
ng] Starting remoting
[INFO] [09/30/2018 19:04:04.014] [run-main-0] [akka.remote.Remoti
ng] Remoting started; listening on addresses :[akka.tcp://Bakery@
127.0.0.1:2552]
[INFO] [09/30/2018 19:04:04.016] [run-main-0] [akka.remote.Remoti
ng] Remoting now listens on addresses: [akka.tcp://Bakery@127.0.0
.1:2552]
Shopping list ShoppingList(8,400,80,40)
Shopping list ShoppingList(10,500,100,50)
[WARN] [SECURITY][09/30/2018 19:04:05.439] [Bakery-akka.remote.de
fault-remote-dispatcher-8] [akka.serialization.Serialization(akka
://Bakery)] Using the default Java serializer for class [ch13.Sto
re$ShoppingList] which is not recommended because of performance
implications. Use another serializer or disable this warning usin
g the setting 'akka.actor.warn-about-java-serializer-usage'
Shopping list ShoppingList(11,550,110,55)
resuming
```

```
slasch@packt:~$ cd Learn-Scala---Fundamentals-of-Scala-2.13/ch13
slasch@packt:~/Learn-Scala---Fundamentals-of-Scala-2.13/ch13$ sbt
 "runMain ch13.Store"
[info] Loading project definition from /home/slasch/Learn-Scala--
-Fundamentals-of-Scala-2.13/ch13/project
[info] Updating ProjectRef(uri("file:/home/slasch/Learn-Scala---F
undamentals-of-Scala-2.13/ch13/project/"), "ch13-build")...
[info] Done updating.
[info] Loading settings for project ch13 from build.sbt ...
[info] Set current project to akka-streams-bakery (in build file:
/home/slasch/Learn-Scala---Fundamentals-of-Scala-2.13/ch13/)
[info] Updating ...
[info] downloading https://repo1.maven.org/maven2/com/typesafe/ak
ka/akka-stream-testkit_2.12/2.5.14/akka-stream-testkit_2.12-2.5.1
4.jar ...
[info]  [SUCCESSFUL ] com.typesafe.akka#akka-stream-testkit_2.12;
2.5.14!akka-stream-testkit_2.12.jar (263ms)
[info] Done updating.
[warn] There may be incompatibilities among your library dependen
cies.
[warn] Run 'evicted' to see detailed eviction warnings
[info] Compiling 3 Scala sources to /home/slasch/Learn-Scala---Fu
ndamentals-of-Scala-2.13/ch13/target/scala-2.12/classes ...
[info] Done compiling.
WARNING: An illegal reflective access operation has occurred
WARNING: Illegal reflective access by com.google.protobuf.UnsafeU
til (file:/home/slasch/.sbt/boot/scala-2.12.6/org.scala-sbt/sbt/1
.2.3/protobuf-java-3.3.1.jar) to field java.nio.Buffer.address
WARNING: Please consider reporting this to the maintainers of com
.google.protobuf.UnsafeUtil
WARNING: Use --illegal-access=warn to enable warnings of further
illegal reflective access operations
WARNING: All illegal access operations will be denied in a future
 release
[warn] Multiple main classes detected.  Run 'show discoveredMainC
lasses' to see the list
```

# Chapter 14: Project 1 - Building Microservices with Scala

```
slasch@packt:~$ cd Learn-Scala---Fundamentals-of-Scala-2.13/ch14
slasch@packt:~/Learn-Scala---Fundamentals-of-Scala-2.13/ch14$ sbt
[info] Loading settings for project ch14-build from plugins.sbt ...
[info] Loading project definition from /home/slasch/Learn-Scala---Fundamentals-of-Scala-2.13/ch14/project
[info] Loading settings for project root from build.sbt ...
[info] Set current project to root (in build file:/home/slasch/Learn-Scala---Fundamentals-of-Scala-2.13/ch14/)
[info] sbt server started at local:///home/slasch/.sbt/1.0/server/5feabd4374d0fc31ffb8/sock
sbt:root> http4s/run
d[info] Running ch14.Server
19:52:45.105 [run-main-0] INFO org.flywaydb.core.internal.util.VersionPrinter - Flyway Community Edition 5.1.4 by Boxfuse
19:52:45.131 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - HikariPool-1 - configuration:
19:52:45.152 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - allowPoolSuspension.............false
19:52:45.157 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - autoCommit.....................true
19:52:45.157 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - catalog........................none
19:52:45.158 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - connectionInitSql..............none
19:52:45.160 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - connectionTestQuery............none
19:52:45.161 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - connectionTimeout..............30000
19:52:45.161 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - dataSource.....................none
19:52:45.161 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - dataSourceClassName............none
19:52:45.161 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - dataSourceJNDI.................none
19:52:45.162 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - dataSourceProperties............{password=<masked>}
19:52:45.165 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - driverClassName................none
19:52:45.165 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - healthCheckProperties...........{}
19:52:45.165 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - healthCheckRegistry............none
19:52:45.165 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - idleTimeout.....................600000
19:52:45.165 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - initializationFailTimeout.......1
19:52:45.166 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - isolateInternalQueries..........false
19:52:45.166 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - jdbcUrl.........................jdbc:h2:mem:ch14;DB_CLOSE_DELAY=-1
19:52:45.167 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - leakDetectionThreshold..........0
19:52:45.167 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - maxLifetime.....................1800000
19:52:45.167 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - maximumPoolSize.................10
19:52:45.167 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - metricRegistry..................none
19:52:45.167 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - metricsTrackerFactory...........none
19:52:45.167 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - minimumIdle.....................10
19:52:45.167 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - password.....................<masked>
19:52:45.167 [run-main-0] DEBUG com.zaxxer.hikari.HikariConfig - poolName......................"HikariPool-1"
```

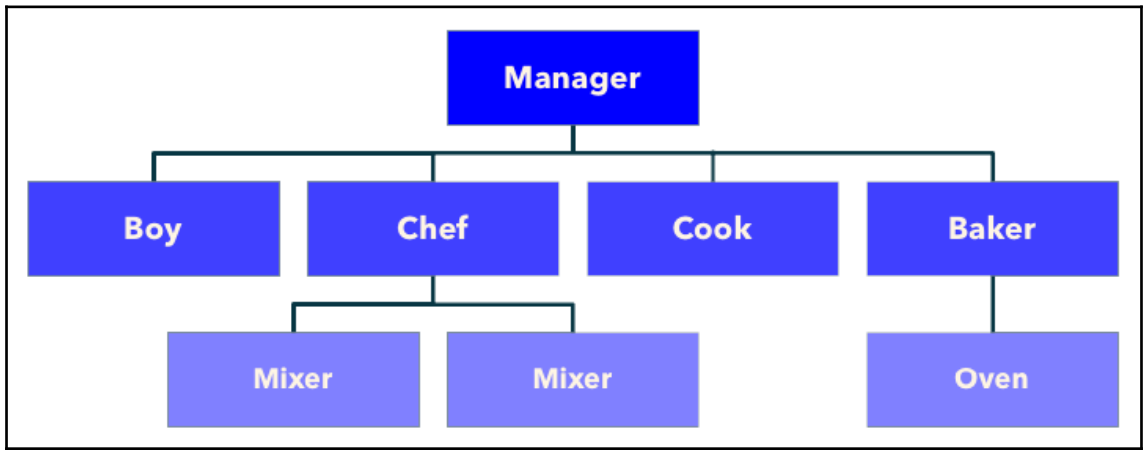
```
19:52:46.799 [run-main-0] DEBUG org.flywaydb.core.internal.database.Table - Lock acquired for table "PUBLIC"."flyway_schema_history"
19:52:46.845 [run-main-0] INFO org.flywaydb.core.internal.command.DbMigrate - Current version of schema "PUBLIC": << Empty Schema >>
19:52:46.867 [run-main-0] DEBUG org.flywaydb.core.internal.database.ExecutableSqlScript - Parsing V1__inventory_table.sql ...
19:52:46.878 [run-main-0] DEBUG org.flywaydb.core.internal.database.ExecutableSqlScript - Found statement at line 1: CREATE TABLE art
icle (
  name  VARCHAR PRIMARY KEY,
  count INTEGER NOT NULL CHECK (count >= 0)
)
19:52:46.879 [run-main-0] INFO org.flywaydb.core.internal.command.DbMigrate - Migrating schema "PUBLIC" to version 1 - inventory tabl
e
19:52:46.883 [run-main-0] DEBUG org.flywaydb.core.internal.database.ExecutableSqlScript - Executing SQL: CREATE TABLE article (
  name  VARCHAR PRIMARY KEY,
  count INTEGER NOT NULL CHECK (count >= 0)
)
19:52:46.891 [run-main-0] DEBUG org.flywaydb.core.internal.database.ExecutableSqlScript - Update Count: 0
19:52:46.902 [run-main-0] DEBUG org.flywaydb.core.internal.command.DbMigrate - Successfully completed migration of schema "PUBLIC" to
 version 1 - inventory table
19:52:46.959 [run-main-0] DEBUG org.flywaydb.core.internal.database.Table - Locking table "PUBLIC"."flyway_schema_history"...
19:52:46.968 [run-main-0] DEBUG org.flywaydb.core.internal.database.Table - Lock acquired for table "PUBLIC"."flyway_schema_history"
19:52:46.971 [run-main-0] DEBUG org.flywaydb.core.internal.schemahistory.JdbcTableSchemaHistory - Schema History table "PUBLIC"."flyw
ay_schema_history" successfully updated to reflect changes
19:52:46.979 [run-main-0] DEBUG org.flywaydb.core.internal.database.Table - Locking table "PUBLIC"."flyway_schema_history"...
19:52:47.003 [run-main-0] DEBUG org.flywaydb.core.internal.database.Table - Lock acquired for table "PUBLIC"."flyway_schema_history"
19:52:47.050 [run-main-0] INFO org.flywaydb.core.internal.command.DbMigrate - Successfully applied 1 migration to schema "PUBLIC" (ex
ecution time 00:00.567s)
19:52:47.357 [run-main-0] INFO org.http4s.blaze.channel.nio1.NIO1SocketServerGroup - Service bound to address /0:0:0:0:0:0:0:0:8080
19:52:47.358 [run-main-0] INFO org.http4s.server.blaze.BlazeBuilder -    _    _    _          _ _
19:52:47.361 [run-main-0] INFO org.http4s.server.blaze.BlazeBuilder -  | |_| |_| |_ _ __| | | ___
19:52:47.361 [run-main-0] INFO org.http4s.server.blaze.BlazeBuilder -  | ' \  _|  _| '_ \_  _(_-<
19:52:47.361 [run-main-0] INFO org.http4s.server.blaze.BlazeBuilder -  |_||_\__|\__| .__/ |_|/__/
19:52:47.361 [run-main-0] INFO org.http4s.server.blaze.BlazeBuilder -            |_|
19:52:47.520 [run-main-0] INFO org.http4s.server.blaze.BlazeBuilder - http4s v0.18.9 on blaze v0.12.13 started at http://[0:0:0:0:0:0
:0:0]:8080/
19:53:15.716 [HikariPool-1 housekeeper] DEBUG com.zaxxer.hikari.pool.HikariPool - HikariPool-1 - Pool stats (total=10, active=0, idle
=10, waiting=0)
```

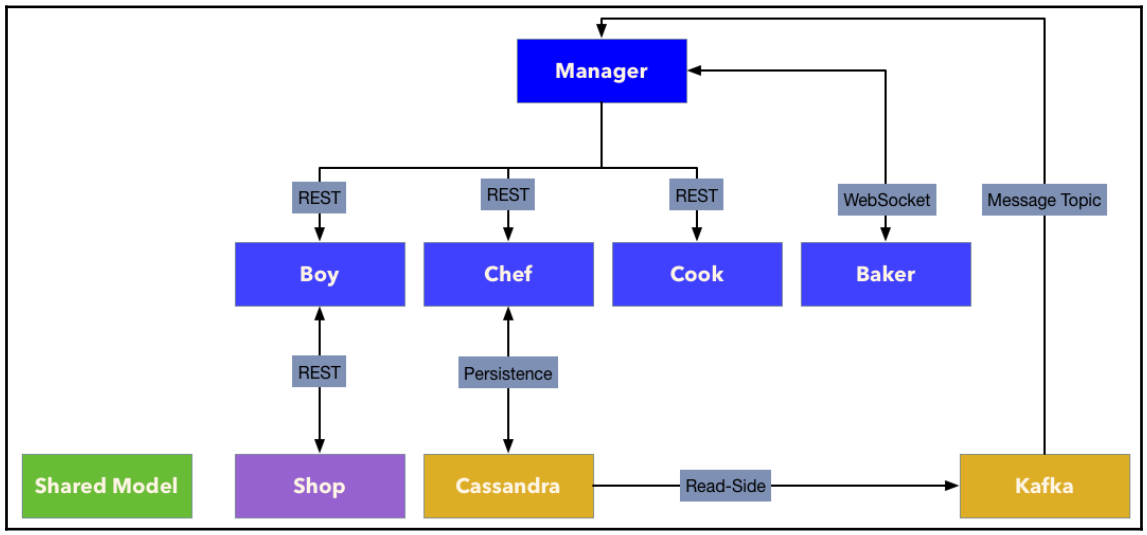
```
slasch void:~$ ## Get Inventory
slasch void:~$ curl "http://localhost:8080/inventory"
{}slasch void:~$ ## Create Chocolate
slasch void:~$ curl -X "POST" "http://localhost:8080/articles/chocolate"
slasch void:~$ ## Create Eggs
slasch void:~$ curl -X "POST" "http://localhost:8080/articles/eggs"
slasch void:~$ ## Restock
slasch void:~$ curl -X "POST" "http://localhost:8080/restock" \
>      -H 'Content-Type: application/json; charset=utf-8' \
>      -d $'{
>   "stock": {
>     "chocolate": 10000,
>     "sugar": 10000,
>     "flour": 10000,
>     "eggs": 10000
>   }
> }'
curl: (18) transfer closed with outstanding read data remaining
slasch void:~$ ## Reinventory
slasch void:~$ curl -X "POST" "http://localhost:8080/restock" \
>      -H 'Content-Type: application/json; charset=utf-8' \
>      -d $'{
>   "inventory": {
>     "chocolate": 10000,
>     "sugar": 10000,
>     "flour": 10000,
>     "eggs": 10000
>   }
> }'
{"chocolate":10000,"eggs":10000}slasch void:~$ ## Get Inventory
slasch void:~$ curl "http://localhost:8080/inventory"
{"chocolate":10000,"eggs":10000}slasch void:~$
```

```
slasch@packt:~$ cd Learn-Scala---Fundamentals-of-Scala-2.13/ch14
slasch@packt:~/Learn-Scala---Fundamentals-of-Scala-2.13/ch14$ sbt
[info] Loading settings for project ch14-build from plugins.sbt ...
[info] Loading project definition from /home/slasch/Learn-Scala---Fundamentals-of-Scala-2.13/ch14/project
[info] Loading settings for project root from build.sbt ...
[info] Set current project to root (in build file:/home/slasch/Learn-Scala---Fundamentals-of-Scala-2.13/ch14/)
[info] sbt server started at local:///home/slasch/.sbt/1.0/server/5feabd4374d0fc31ffb8/sock
sbt:root> akkaHttp/run
[info] Updating akkaHttp...
[info] downloading https://repo1.maven.org/maven2/com/typesafe/akka/akka-slf4j_2.12/2.5.14/akka-slf4j_2.12-2.5.14.jar ...
[info]  [SUCCESSFUL ] com.typesafe.akka#akka-slf4j_2.12;2.5.14!akka-slf4j_2.12.jar (1167ms)
[info] Done updating.
[warn] There may be incompatibilities among your library dependencies.
[warn] Run 'evicted' to see detailed eviction warnings
[info] Packaging /home/slasch/Learn-Scala---Fundamentals-of-Scala-2.13/ch14/akka-http/target/scala-2.12/akka-http_2.12-1.0-SNAPSHOT.j
ar ...
[info] Done packaging.
[info] Running ch14.Server
20:26:48.713 [ch14-akka.actor.default-dispatcher-5] INFO  akka.event.slf4j.Slf4jLogger - Slf4jLogger started
20:26:48.991 [run-main-0] INFO  o.f.c.internal.util.VersionPrinter - Flyway Community Edition 5.1.4 by Boxfuse
20:26:49.559 [run-main-0] INFO  o.f.c.i.database.DatabaseFactory - Database: jdbc:h2:file:./ch14 (H2 1.4)
20:26:49.856 [run-main-0] INFO  o.f.core.internal.command.DbValidate - Successfully validated 1 migration (execution time 00:00.065s)
20:26:49.931 [run-main-0] INFO  o.f.core.internal.command.DbMigrate - Current version of schema "PUBLIC": 1
20:26:49.933 [run-main-0] INFO  o.f.core.internal.command.DbMigrate - Schema "PUBLIC" is up to date. No migration necessary.
```

```
slasch void: $ curl "http://localhost:8080/inventory"
{"state":{"eggs":935,"flour":1000,"sugar":1000,"chocolate":995}}slasch void: $ curl -X "POST" "http://localhost:8080/purchase" \
>      -H 'Content-Type: application/json; charset=utf-8' \
>      -d $'{
>   "order": {
>     "chocolate": 5,
>     "eggs": 65
>   }
> }'
{"order":{"chocolate":5,"eggs":65}}
slasch void: $ curl "http://localhost:8080/inventory"
{"state":{"eggs":870,"flour":1000,"sugar":1000,"chocolate":990}}slasch void: $ _
```

# Chapter 15: Project 2 - Building Microservices with Lagom



```
slasch void:~/Dropbox/packt$ cd Learn-Scala---Fundamentals-of-Scala-2.12/ch15
slasch void:~/Dropbox/packt/Learn-Scala---Fundamentals-of-Scala-2.12/ch15 [master]$ sbt
[info] Loading settings for project ch15-build from plugins.sbt ...
[info] Loading project definition from /Users/slasch/Dropbox/packt/Learn-Scala---Fundamentals-of-Scala-2.12/ch15/project
[info] Loading settings for project bakery from build.sbt ...
[info] Set current project to bakery (in build file:/Users/slasch/Dropbox/packt/Learn-Scala---Fundamentals-of-Scala-2.12/ch15/)
[info] sbt server started at local:///Users/slasch/.sbt/1.0/server/1b265a88e47ace241bb7/sock
sbt:bakery> runAll
```

```
slasch void:~/Dropbox/packt$ cd Learn-Scala---Fundamentals-of-Scala-2.12/ch14
slasch void:~/Dropbox/packt/Learn-Scala---Fundamentals-of-Scala-2.12/ch14 [master]$ sbt
[info] Loading settings for project ch14-build from plugins.sbt ...
[info] Loading project definition from /Users/slasch/Dropbox/packt/Learn-Scala---Fundamentals-of-Scala-2.12/ch14/project
[info] Loading settings for project root from build.sbt ...
[info] Set current project to root (in build file:/Users/slasch/Dropbox/packt/Learn-Scala---Fundamentals-of-Scala-2.12/ch14/)
[info] sbt server started at local:///Users/slasch/.sbt/1.0/server/8034325e15380d474f63/sock
sbt:root> akkaHttp/run
[info] Running ch14.Server
21:06:56.474 [ch14-akka.actor.default-dispatcher-2] INFO  akka.event.slf4j.Slf4jLogger - Slf4jLogger started
21:06:56.693 [run-main-0] INFO  o.f.c.internal.util.VersionPrinter - Flyway Community Edition 5.1.4 by Boxfuse
21:06:57.395 [run-main-0] INFO  o.f.c.i.database.DatabaseFactory - Database: jdbc:h2:file:./ch14 (H2 1.4)
21:06:57.685 [run-main-0] INFO  o.f.core.internal.command.DbValidate - Successfully validated 1 migration (execution time 00:00.056s)
21:06:57.774 [run-main-0] INFO  o.f.core.internal.command.DbMigrate - Current version of schema "PUBLIC": 1
21:06:57.778 [run-main-0] INFO  o.f.core.internal.command.DbMigrate - Schema "PUBLIC" is up to date. No migration necessary.
```

```
20:55:58.666 [info] Manager [] - Shopping list: ShoppingList(10,300,100,50)
20:55:59.735 [info] Manager [] - Sent Groceries(10,300,100,50) to Chef
20:56:11.570 [info] Baker [] - Baking: Source(SourceShape(Map.out(882804106)))
20:56:11.582 [info] BakerFlow [] - Extracting: RawCookies(15)
20:56:11.583 [info] Oven [] - Baked: RawCookies(12)
```

# Chapter 16: Preparing the Environment and Running Code Samples

```
Last login: Sat Sep 29 15:48:30 on ttys006
slasch void: $ wget https://download.java.net/java/ga/jdk11/openjdk-11_osx-x64_bin.tar.gz
--2018-09-29 15:53:02--  https://download.java.net/java/ga/jdk11/openjdk-11_osx-x64_bin.tar.gz
Aufl"osen des Hostnamens download.java.net (download.java.net)... 23.211.0.195
Verbindungsaufbau zu download.java.net (download.java.net)|23.211.0.195|:443 ... verbunden.
HTTP-Anforderung gesendet, auf Antwort wird gewartet ... 200 OK
L"ange: 182717049 (174M) [application/x-gzip]
Wird in <<openjdk-11_osx-x64_bin.tar.gz.1>> gespeichert.

openjdk-11_osx-x64_bin.tar.gz.1         100%[=====================================================================================>] 174.25M  2.26MB/s    in 78s

2018-09-29 15:54:21 (2.22 MB/s) - <<openjdk-11_osx-x64_bin.tar.gz.1>> gespeichert [182717049/182717049]

slasch void: $ tar -xzf openjdk-11_osx-x64_bin.tar.gz
slasch void: $ export JAVA_HOME=`pwd`/jdk-11.jdk/Contents/Home/
slasch void: $ echo 'PATH=$PATH':$JAVA_HOME/bin >> .bashrc
slasch void: $ export PATH=$PATH:$JAVA_HOME/bin
slasch void: $ java -version
openjdk version "11" 2018-09-25
OpenJDK Runtime Environment 18.9 (build 11+28)
OpenJDK 64-Bit Server VM 18.9 (build 11+28, mixed mode)
slasch void: $
```

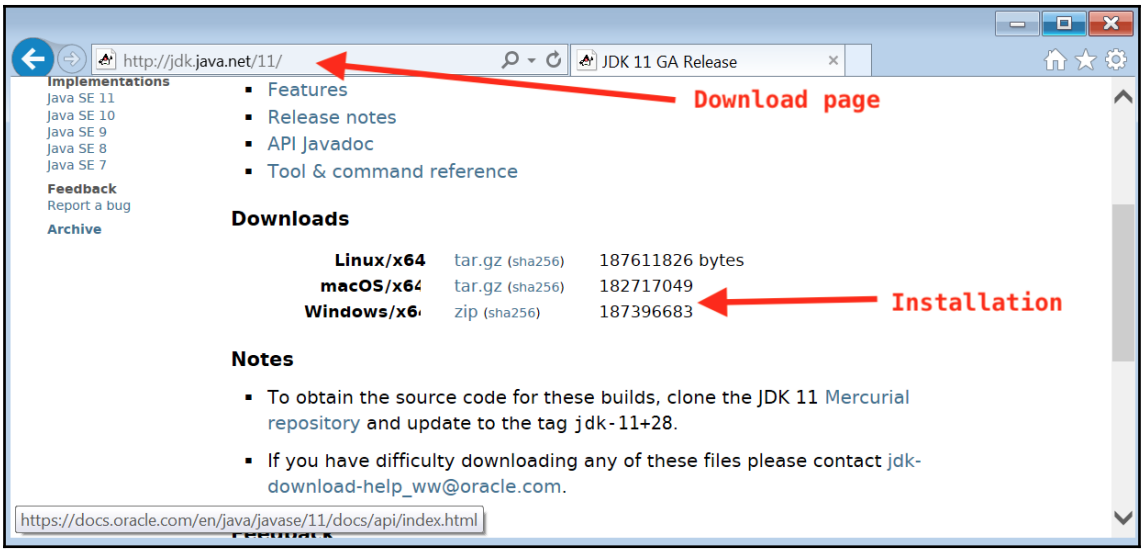
Download installation file

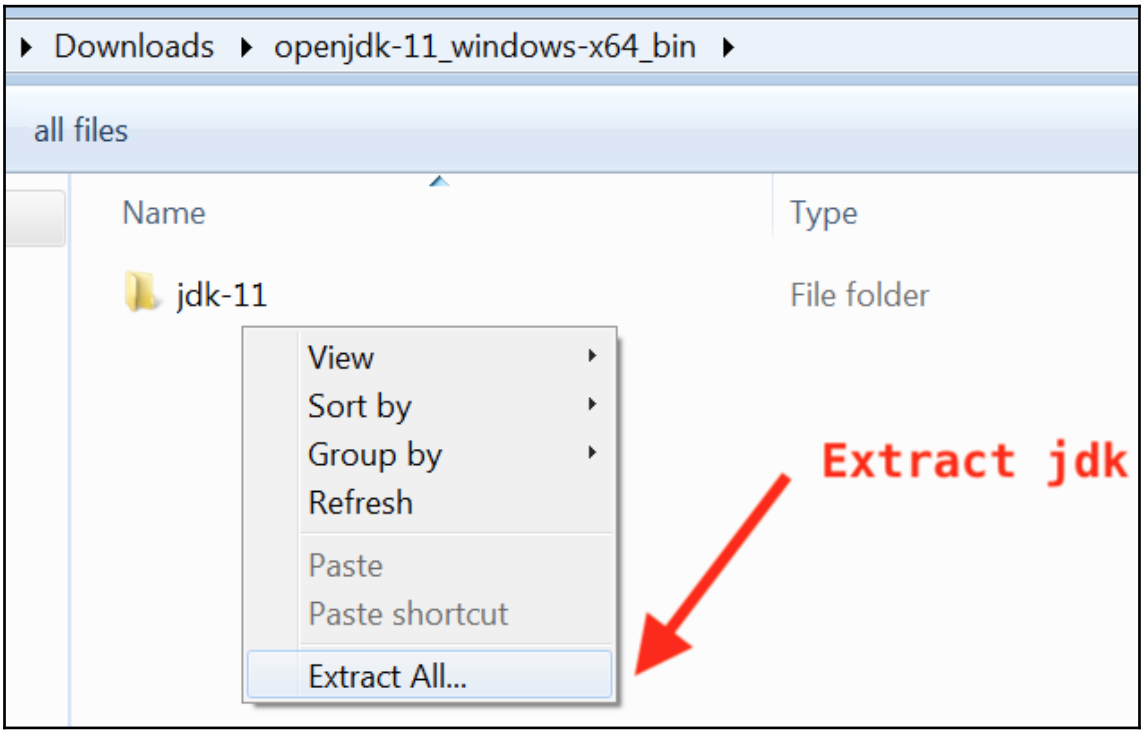
Extract the installation

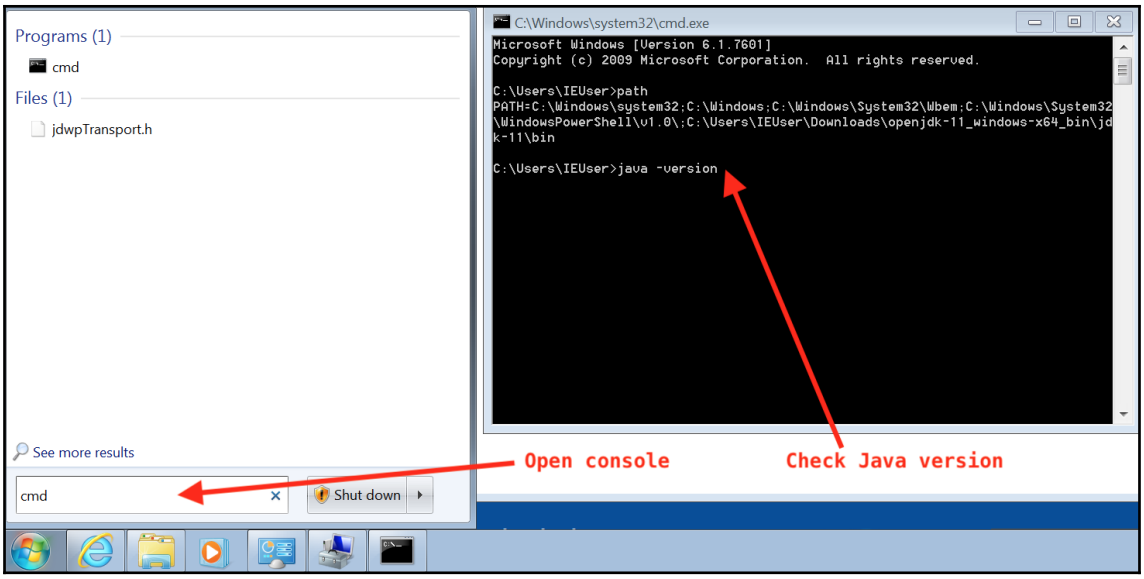
Update environment

Verify the installation is a success

```
slasch@packt:~$ wget https://download.java.net/java/ga/jdk11/openjdk-11_linux-x64_bin.tar.gz
--2018-09-29 19:19:45--  https://download.java.net/java/ga/jdk11/openjdk-11_linux-x64_bin.tar.gz
Resolving download.java.net (download.java.net)... 23.211.0.195
Connecting to download.java.net (download.java.net)|23.211.0.195|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 187611826 (179M) [application/x-gzip]
Saving to: ‘openjdk-11_linux-x64_bin.tar.gz’

openjdk-11_linux-x64_bin.tar.gz   100%[=============================================================>] 178,92M  1,64MB/s    in 2m 1s

2018-09-29 19:21:48 (1,48 MB/s) - ‘openjdk-11_linux-x64_bin.tar.gz’ saved [187611826/187611826]

slasch@packt:~$ tar -xzf openjdk-11_linux-x64_bin.tar.gz
slasch@packt:~$ export JAVA_HOME=`pwd`/jdk-11/
slasch@packt:~$ echo 'PATH=$PATH':$JAVA_HOME/bin >> .bashrc
slasch@packt:~$ export PATH=$PATH:$JAVA_HOME/bin
slasch@packt:~$ java -version
openjdk version "11" 2018-09-25
OpenJDK Runtime Environment 18.9 (build 11+28)
OpenJDK 64-Bit Server VM 18.9 (build 11+28, mixed mode)
slasch@packt:~$
```


http://jdk.java.net/11/
JDK 11 GA Release
Download page
Implementations
Java SE 11
Java SE 10
Java SE 9
Java SE 8
Java SE 7
Feedback
Report a bug
Archive
Features
Release notes
API Javadoc
Tool & command reference
Downloads
Linux/x64 tar.gz (sha256) 187611826 bytes
macOS/x64 tar.gz (sha256) 182717049
Windows/x6 zip (sha256) 187396683
Installation
Notes
To obtain the source code for these builds, clone the JDK 11 Mercurial repository and update to the tag jdk-11+28.
If you have difficulty downloading any of these files please contact jdk-download-help_ww@oracle.com.
https://docs.oracle.com/en/java/javase/11/docs/api/index.html


Downloads
openjdk-11_windows-x64_bin
all files
Name
Type
jdk-11
File folder
View
Sort by
Group by
Refresh
Paste
Paste shortcut
Extract All...
Extract jdk



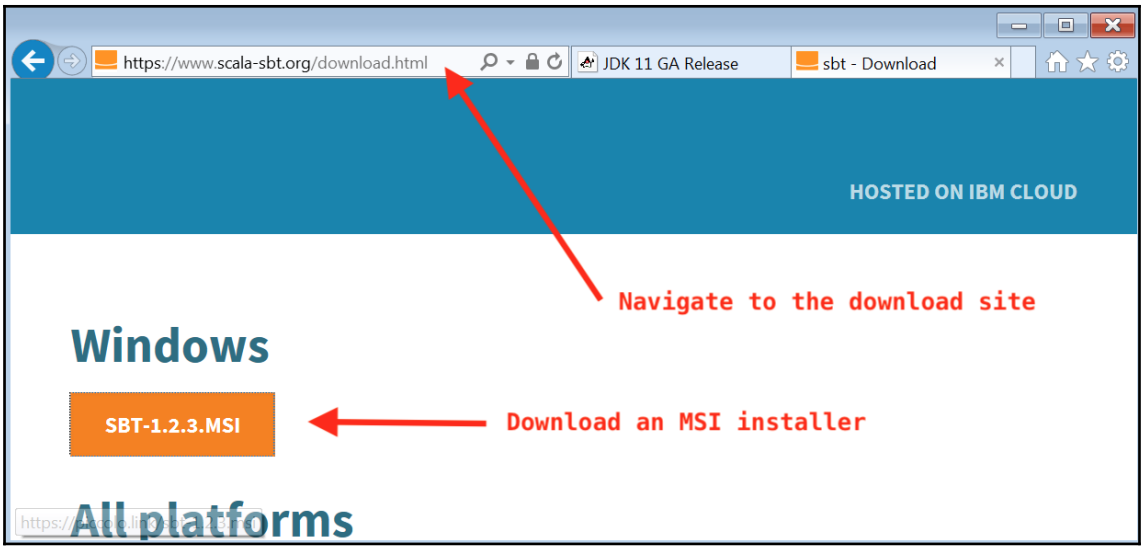

```
slasch void: $ wget https://piccolo.link/sbt-1.2.3.tgz
--2018-09-29 15:59:14--  https://piccolo.link/sbt-1.2.3.tgz
Aufl"osen des Hostnamens piccolo.link (piccolo.link)... 159.8.72.228
Verbindungsaufbau zu piccolo.link (piccolo.link)|159.8.72.228|:443 ... verbunden.
HTTP-Anforderung gesendet, auf Antwort wird gewartet ... 301 Moved Permanently
Platz: https://sbt-downloads.cdnedge.bluemix.net/releases/v1.2.3/sbt-1.2.3.tgz [folgend]
--2018-09-29 15:59:16--  https://sbt-downloads.cdnedge.bluemix.net/releases/v1.2.3/sbt-1.2.3.tgz
Aufl"osen des Hostnamens sbt-downloads.cdnedge.bluemix.net (sbt-downloads.cdnedge.bluemix.net)... 23.37.48.60
Verbindungsaufbau zu sbt-downloads.cdnedge.bluemix.net (sbt-downloads.cdnedge.bluemix.net)|23.37.48.60|:443 ... verbunden.
HTTP-Anforderung gesendet, auf Antwort wird gewartet ... 200 OK
L"ange: 46849530 (45M) [application/gzip]
Wird in <<sbt-1.2.3.tgz.1>> gespeichert.

sbt-1.2.3.tgz.1                     100%[=============================================================================>]  44.68M  2.26MB/s    in 19s

2018-09-29 15:59:35 (2.38 MB/s) - <<sbt-1.2.3.tgz.1>> gespeichert [46849530/46849530]

slasch void: $ tar -xzf sbt-1.2.3.tgz
slasch void: $ export SBT_HOME=`pwd`/sbt/bin
slasch void: $ echo 'PATH=$PATH':$SBT_HOME >> .bashrc
slasch void: $ export PATH=$PATH:$SBT_HOME
slasch void: $ sbt version
[info] Loading project definition from /Users/slasch/project
[info] Set current project to slasch (in build file:/Users/slasch/)
[info] 0.1.0-SNAPSHOT
slasch void: $
```

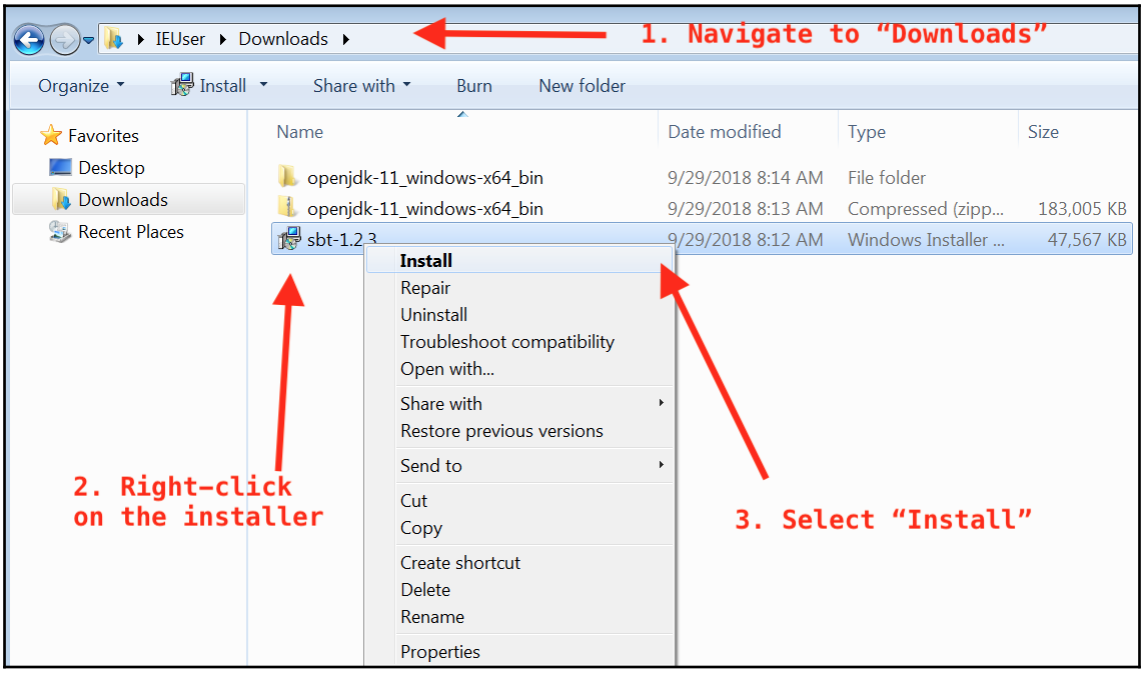
Download the installation bundle

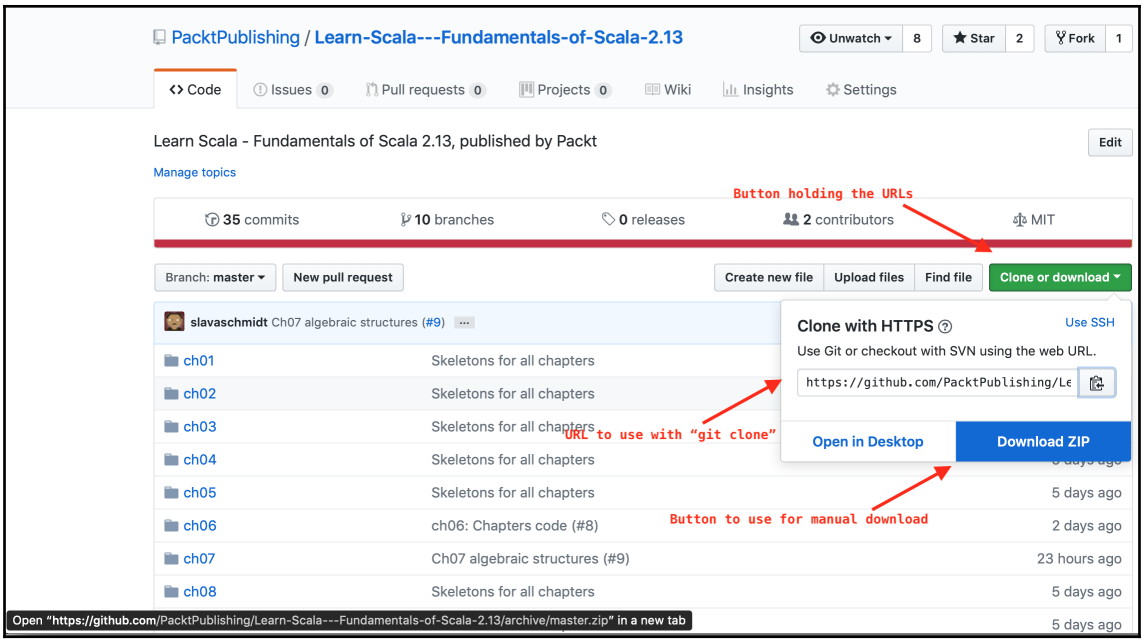
Extract sbt files

Update environment

Verify installation


https://www.scala-sbt.org/download.html
JDK 11 GA Release
sbt - Download
HOSTED ON IBM CLOUD
Navigate to the download site
Windows
SBT-1.2.3.MSI
Download an MSI installer
All platforms


IEUser ▸ Downloads ▸
1. Navigate to "Downloads"
Organize
Install
Share with
Burn
New folder
Favorites
Desktop
Downloads
Recent Places
Name
Date modified
Type
Size
openjdk-11_windows-x64_bin
9/29/2018 8:14 AM
File folder
openjdk-11_windows-x64_bin
9/29/2018 8:13 AM
Compressed (zipp...
183,005 KB
sbt-1.2.3
9/29/2018 8:12 AM
Windows Installer ...
47,567 KB
Install
Repair
Uninstall
Troubleshoot compatibility
Open with...
Share with
Restore previous versions
Send to
Cut
Copy
Create shortcut
Delete
Rename
Properties
2. Right-click on the installer
3. Select "Install"


PacktPublishing / Learn-Scala---Fundamentals-of-Scala-2.13
Unwatch 8
Star 2
Fork 1
Code
Issues 0
Pull requests 0
Projects 0
Wiki
Insights
Settings
Learn Scala - Fundamentals of Scala 2.13, published by Packt
Edit
Manage topics
Button holding the URLs
35 commits
10 branches
0 releases
2 contributors
MIT
Branch: master
New pull request
Create new file
Upload files
Find file
Clone or download
slavaschmidt Ch07 algebraic structures (#9)
Clone with HTTPS
Use SSH
Use Git or checkout with SVN using the web URL.
https://github.com/PacktPublishing/Le
URL to use with "git clone"
Open in Desktop
Download ZIP
Button to use for manual download
ch01 Skeletons for all chapters
ch02 Skeletons for all chapters
ch03 Skeletons for all chapters
ch04 Skeletons for all chapters
ch05 Skeletons for all chapters 5 days ago
ch06 ch06: Chapters code (#8) 2 days ago
ch07 Ch07 algebraic structures (#9) 23 hours ago
ch08 Skeletons for all chapters 5 days ago
5 days ago
Open "https://github.com/PacktPublishing/Learn-Scala---Fundamentals-of-Scala-2.13/archive/master.zip" in a new tab

```
slasch void:~/code$ git clone https://github.com/PacktPublishing/Learn-Scala---Fundamentals-of-Scala-2.13
Cloning into 'Learn-Scala---Fundamentals-of-Scala-2.13'...
remote: Enumerating objects: 93, done.
remote: Counting objects: 100% (93/93), done.
remote: Compressing objects: 100% (61/61), done.
remote: Total 602 (delta 11), reused 80 (delta 8), pack-reused 509
Receiving objects: 100% (602/602), 108.48 KiB | 793.00 KiB/s, done.
Resolving deltas: 100% (119/119), done.
slasch void:~/code$ wget https://github.com/PacktPublishing/Learn-Scala---Fundamentals-of-Scala-2.13/archive/master.zip
--2018-09-29 17:51:28--  https://github.com/PacktPublishing/Learn-Scala---Fundamentals-of-Scala-2.13/archive/master.zip
Auf"osen des Hostnamens github.com (github.com)... 192.30.253.113, 192.30.253.112
Verbindungsaufbau zu github.com (github.com)|192.30.253.113|:443 ... verbunden.
HTTP-Anforderung gesendet, auf Antwort wird gewartet ... 302 Found
Platz: https://codeload.github.com/PacktPublishing/Learn-Scala---Fundamentals-of-Scala-2.13/zip/master [folgend]
--2018-09-29 17:51:29--  https://codeload.github.com/PacktPublishing/Learn-Scala---Fundamentals-of-Scala-2.13/zip/master
Auf"osen des Hostnamens codeload.github.com (codeload.github.com)... 192.30.253.120, 192.30.253.121
Verbindungsaufbau zu codeload.github.com (codeload.github.com)|192.30.253.120|:443 ... verbunden.
HTTP-Anforderung gesendet, auf Antwort wird gewartet ... 200 OK
L"ange: nicht spezifiziert [application/zip]
Wird in <<master.zip>> gespeichert.

master.zip                              [  <=>                                                                ] 146.22K   388KB/s    in 0.4s

2018-09-29 17:51:30 (388 KB/s) - <<master.zip>> gespeichert [149728]

slasch void:~/code$ unzip master
Archive:  master.zip
400449748f4fed56c817b7c046aa80c7aa64cece
   creating: Learn-Scala---Fundamentals-of-Scala-2.13-master/
  inflating: Learn-Scala---Fundamentals-of-Scala-2.13-master/.gitignore
  inflating: Learn-Scala---Fundamentals-of-Scala-2.13-master/LICENSE
  inflating: Learn-Scala---Fundamentals-of-Scala-2.13-master/README.md
  inflating: Learn-Scala---Fundamentals-of-Scala-2.13-master/build.sbt
   creating: Learn-Scala---Fundamentals-of-Scala-2.13-master/ch01/
  inflating: Learn-Scala---Fundamentals-of-Scala-2.13-master/ch01/build.sbt
   creating: Learn-Scala---Fundamentals-of-Scala-2.13-master/ch01/project/
 extracting: Learn-Scala---Fundamentals-of-Scala-2.13-master/ch01/project/build.properties
   creating: Learn-Scala---Fundamentals-of-Scala-2.13-master/ch02/
  inflating: Learn-Scala---Fundamentals-of-Scala-2.13-master/ch02/build.sbt
   creating: Learn-Scala---Fundamentals-of-Scala-2.13-master/ch02/project/
 extracting: Learn-Scala---Fundamentals-of-Scala-2.13-master/ch02/project/build.properties
   creating: Learn-Scala---Fundamentals-of-Scala-2.13-master/ch02/src/
   creating: Learn-Scala---Fundamentals-of-Scala-2.13-master/ch02/src/main/
   creating: Learn-Scala---Fundamentals-of-Scala-2.13-master/ch02/src/main/scala/
   creating: Learn-Scala---Fundamentals-of-Scala-2.13-master/ch02/src/main/scala/ch02/
  inflating: Learn-Scala---Fundamentals-of-Scala-2.13-master/ch02/src/main/scala/ch02/Contravariance.scala
```

clonning with git

Downloading

Unzipping downloaded bundle

```
slasch void:~/code$ cd Learn-Scala---Fundamentals-of-Scala-2.13
slasch void:~/code/Learn-Scala---Fundamentals-of-Scala-2.13 [master]$ git pull
Already up to date.
slasch void:~/code/Learn-Scala---Fundamentals-of-Scala-2.13 [master]$ cd ch02
slasch void:~/code/Learn-Scala---Fundamentals-of-Scala-2.13/ch02 [master]$ sbt
[info] Loading project definition from /Users/slasch/code/Learn-Scala---Fundamentals-of-Scala-2.13/ch02/project
[info] Updating ProjectRef(uri("file:/Users/slasch/code/Learn-Scala---Fundamentals-of-Scala-2.13/ch02/project/"), "ch02-build")...
[info] Done updating.
[info] Loading settings from build.sbt ...
[info] Set current project to ch02 (in build file:/Users/slasch/code/Learn-Scala---Fundamentals-of-Scala-2.13/ch02/)
[info] sbt server started at local:///Users/slasch/.sbt/1.0/server/37d37da6e4699d80ac89/sock
sbt:ch02>
```

Changing into the project folder

Getting latest updates

Stepping into the chapters folder

Starting SBT

```
slasch void:~/code/Learn-Scala---Fundamentals-of-Scala-2.13/ch11 [master]$ sbt
[info] Loading project definition from /Users/slasch/code/Learn-Scala---Fundamentals-of-Scala-2.13/ch11/project
[info] Loading settings from build.sbt ...
[info] Set current project to akka-bakery (in build file:/Users/slasch/code/Learn-Scala---Fundamentals-of-Scala-2.13/ch11/)
[info] sbt server started at local:///Users/slasch/.sbt/1.0/server/fd41eff96824613 85ed3/sock
sbt:akka-bakery> test
[INFO] [09/29/2018 18:07:55.548] [pool-5-thread-4] [akka.remote.Remoting] Starting remoting
[INFO] [09/29/2018 18:07:55.548] [pool-5-thread-5] [akka.remote.Remoting] Starting remoting
[INFO] [09/29/2018 18:07:55.856] [pool-5-thread-5] [akka.remote.Remoting] Remoting started; listening on addresses :[akka.tcp://BakerySpec@127.0.0.1:2552]
[INFO] [09/29/2018 18:07:55.860] [pool-5-thread-4] [akka.remote.Remoting] Remoting started; listening on addresses :[akka.tcp://Store@127.0.0.1:2553]
[INFO] [09/29/2018 18:07:55.864] [pool-5-thread-5] [akka.remote.Remoting] Remoting now listens on addresses: [akka.tcp://BakerySpec@127.0.0.1:2552]
[INFO] [09/29/2018 18:07:55.865] [pool-5-thread-4] [akka.remote.Remoting] Remoting now listens on addresses: [akka.tcp://Store@127.0.0.1:2553]
[INFO] [09/29/2018 18:07:56.335] [BakerySpec-akka.actor.default-dispatcher-2] [akka://BakerySpec/user/$a] Message [scala.Symbol] from Actor[akka://BakerySpec/system/testActor-1#1103
913486] to Actor[akka://BakerySpec/user/$a#-1814815196] was not delivered. [1] dead letters encountered. If this is not an expected behavior, then [Actor[akka://BakerySpec/user/$a#-
1814815196]] may have terminated unexpectedly, This logging can be turned off or adjusted with configuration settings 'akka.log-dead-letters' and 'akka.log-dead-letters-during-shutd
own'.
[INFO] [09/29/2018 18:07:56.895] [BakerySpec-akka.remote.default-remote-dispatcher-13] [akka.tcp://BakerySpec@127.0.0.1:2552/system/remoting-terminator] Shutting down remote daemon.
[INFO] [09/29/2018 18:07:56.897] [BakerySpec-akka.remote.default-remote-dispatcher-13] [akka.tcp://BakerySpec@127.0.0.1:2552/system/remoting-terminator] Remote daemon shut down; pro
ceeding with flushing remote transports.
WARNING: An illegal reflective access operation has occurred
WARNING: Illegal reflective access by org.jboss.netty.util.internal.ByteBufferUtil (file:/Users/slasch/.ivy2/cache/io.netty/netty/bundles/netty-3.10.6.Final.jar) to method java.nio.
DirectByteBuffer.cleaner()
WARNING: Please consider reporting this to the maintainers of org.jboss.netty.util.internal.ByteBufferUtil
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations
WARNING: All illegal access operations will be denied in a future release
[INFO] [09/29/2018 18:07:56.942] [BakerySpec-akka.actor.default-dispatcher-4] [akka.remote.Remoting] Remoting shut down
[INFO] [09/29/2018 18:07:56.944] [BakerySpec-akka.remote.default-remote-dispatcher-5] [akka.tcp://BakerySpec@127.0.0.1:2552/system/remoting-terminator] Remoting shut down.
[info] BakerySpec:
[info] The boy should
[info] - should forward given ShoppingList to the seller
[info] - should ignore other message types
[info] The baker should
[info] - should bake cookies in batches
[INFO] [09/29/2018 18:07:59.328] [Store-akka.remote.default-remote-dispatcher-15] [akka.tcp://Store@127.0.0.1:2553/system/remoting-terminator] Shutting down remote daemon.
[INFO] [09/29/2018 18:07:59.329] [Store-akka.remote.default-remote-dispatcher-15] [akka.tcp://Store@127.0.0.1:2553/system/remoting-terminator] Remote daemon shut down; proceeding wi
th flushing remote transports.
[INFO] [09/29/2018 18:07:59.334] [Store-akka.actor.default-dispatcher-6] [akka.remote.Remoting] Remoting shut down
[info] StoreSpec:
[info] A seller in store
[info] - should do nothing for all unexpected message types
[info] - should return groceries if given a shopping list
[info] Run completed in 4 seconds, 768 milliseconds.
[info] Total number of tests run: 5
[info] Suites: completed 2, aborted 0
[info] Tests: succeeded 5, failed 0, canceled 0, ignored 0, pending 0
[info] All tests passed.
[success] Total time: 8 s, completed 29 Sep 2018, 18:07:59
sbt:akka-bakery> _
```

Start SBT

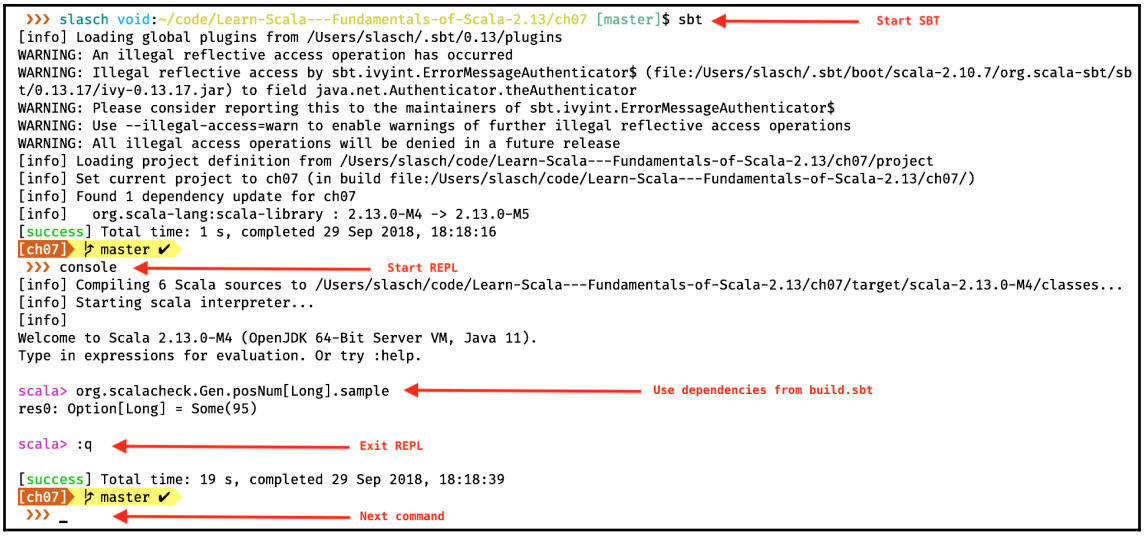
Enter “test” command

SBT is ready for the next command

```
sbt:akka-bakery> run
[warn] Multiple main classes detected.  Run 'show discoveredMainClasses' to see the list

Multiple main classes detected, select one to run:

 [1] ch11.Bakery
 [2] ch11.Store
[info] Packaging /Users/slasch/code/Learn-Scala---Fundamentals-of-Scala-2.13/ch11/target/scala-2.12/akka-bakery_2.12-1.0.jar ...
[info] Done packaging.

Enter number:
```

Enter “run” command

Choose one of the two main classes


Start SBT
Start REPL
Use dependencies from build.sbt
Exit REPL
Next command