



ITERATION WITH FOR LOOPS

For loop

```
val list = List(1, 8, -3, 12)
```

```
for (number <- list) {  
  println(s"number is $number")  
}  
// number is 1  
// number is 8  
// number is -3  
// number is 12
```

Without s String interpolator

```
val list = List(1, 8, -3, 12)
```

```
for (number <- list) {  
  println("number is $number")  
}  
// number is $number  
// number is $number  
// number is $number  
// number is $number
```

Other String interpolators

In standard library

```
println(f"PI is ${Math.PI}%1.2f")  
// PI is 3.14
```

In other libraries

```
val subject = "functional programming"  
  
println(sql"subject = $subject")  
// res: Fragment = Fragment("subject = ?")
```

```
val names = List("Eda", "Bob")  
  
json"{ names : $names }"  
// res: Json = "{ \"names\" : [\"Eda\", \"Bob\"] }"
```

Code block: curly braces

Optional

```
for (number <- list)
  println(s"number is $number")
// number is 1
// number is 8
// number is -3
// number is 12
```

Mandatory

```
for (number <- list) {
  val square = number * number
  println(s"number square is $square")
}
// number square is 1
// number square is 64
// number square is 9
// number square is 144
```

Code block: curly braces

Optional

```
for (number <- list)
  println(s"number is $number")
// number is 1
// number is 8
// number is -3
// number is 12
```

Optional in Scala 3

```
for (number <- list)
  val square = number * number
  println(s"number square is $square")
// number square is 1
// number square is 64
// number square is 9
// number square is 144
```

For loop is a syntax for foreach

```
for (number <- list)
  println(s"number is $number")
// number is 1
// number is 8
// number is -3
// number is 12
```

```
list.foreach(number =>
  println(s"number is $number")
)
// number is 1
// number is 8
// number is -3
// number is 12
```

For loop is a syntax for foreach

```
for (number <- list)
  println(s"number is $number")
// number is 1
// number is 8
// number is -3
// number is 12
```

```
list.foreach(number =>
  println(s"number is $number")
)
// number is 1
// number is 8
// number is -3
// number is 12
```

```
trait List[A] {
  def foreach[To](action: A => To): Unit
}
```


For loop is a syntax for foreach

```
for (number <- list)
  println(s"number is $number")
// number is 1
// number is 8
// number is -3
// number is 12
```

```
list.foreach(number =>
  println(s"number is $number")
)
// number is 1
// number is 8
// number is -3
// number is 12
```

```
trait List[A] {
  def foreach[To](action: A => To): Unit
  def map      [To](update: A => To): List[To]
}
```

For loop is a syntax for foreach

```
for (number <- Point(1, 5))  
  println(s"number is $number")  
// number is 1  
// number is 5
```

```
Point(1, 5).foreach(number =>  
  println(s"number is $number")  
)  
// number is 1  
// number is 5
```

```
case class Point(first: Int, second: Int) {  
  def foreach[To](action: Int => To): Unit = {  
    action(first)  
    action(second)  
  }  
}
```

Nested for loop

```
val shapes = List("triangle", "square")  
val colours = List("red", "green", "blue")
```

```
for {  
  shape <- shapes  
  colour <- colours  
} println(s"The $shape is $colour")  
// The triangle is red  
// The triangle is green  
// The triangle is blue  
// The square is red  
// The square is green  
// The square is blue
```

```
shapes.foreach{ shape =>  
  colours.foreach { colour =>  
    println(s"The $shape is $colour")  
  }  
}  
// The triangle is red  
// The triangle is green  
// The triangle is blue  
// The square is red  
// The square is green  
// The square is blue
```

Nested for loop with different data types

```
val shapes = List("triangle", "square")
val point  = Point(2, 5)
```

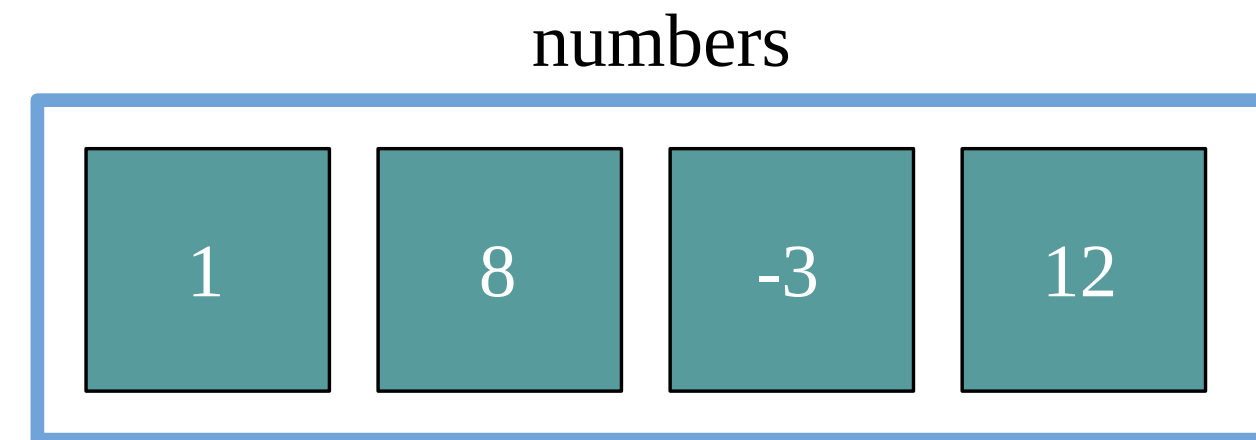
```
for {
  shape <- shapes
  number <- point
} println(s"There is $number ${shape}(s)")
// There is 2 triangle(s)
// There is 5 triangle(s)
// There is 2 square(s)
// There is 5 square(s)
```

```
shapes.foreach{ shape =>
  point.foreach { number =>
    println(s"There is $number ${shape}(s)")
  }
}
// There is 2 triangle(s)
// There is 5 triangle(s)
// There is 2 square(s)
// There is 5 square(s)
```

Use case

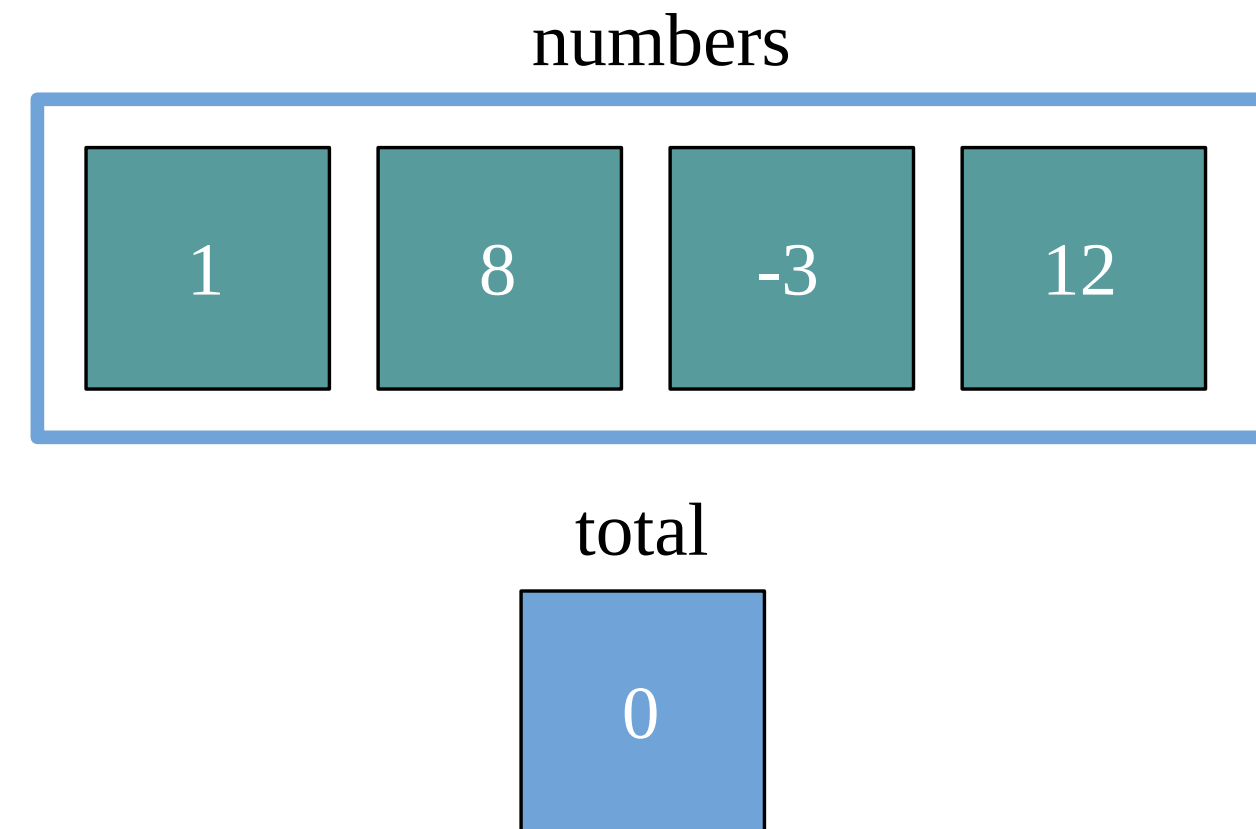
```
def sum(numbers: List[Int]): Int
```

```
sum(List(1, 8, -3, 12))  
// res: Int = 18
```



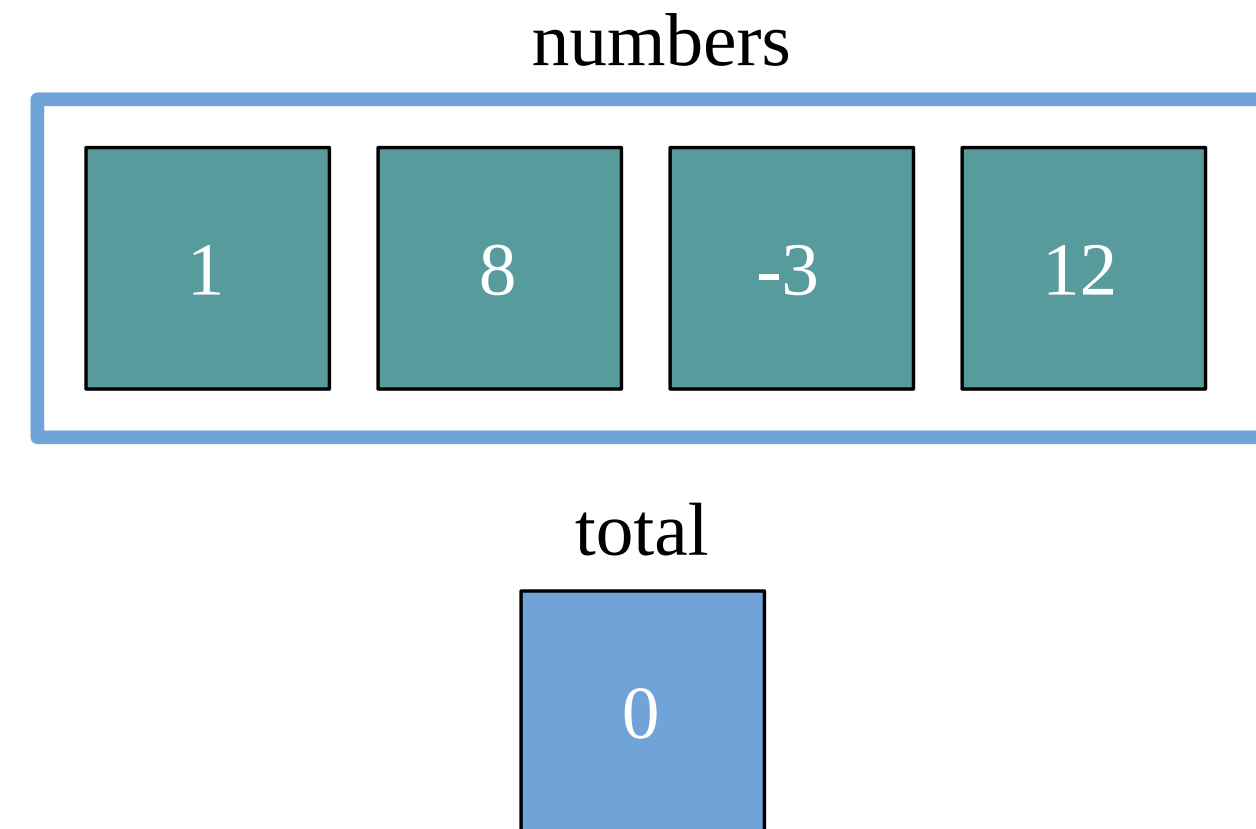
For loop with mutable state

```
def sum(numbers: List[Int]): Int = {  
  var total = 0  
  
  for (number <- numbers)  
    total = total + number  
  
  total  
}
```



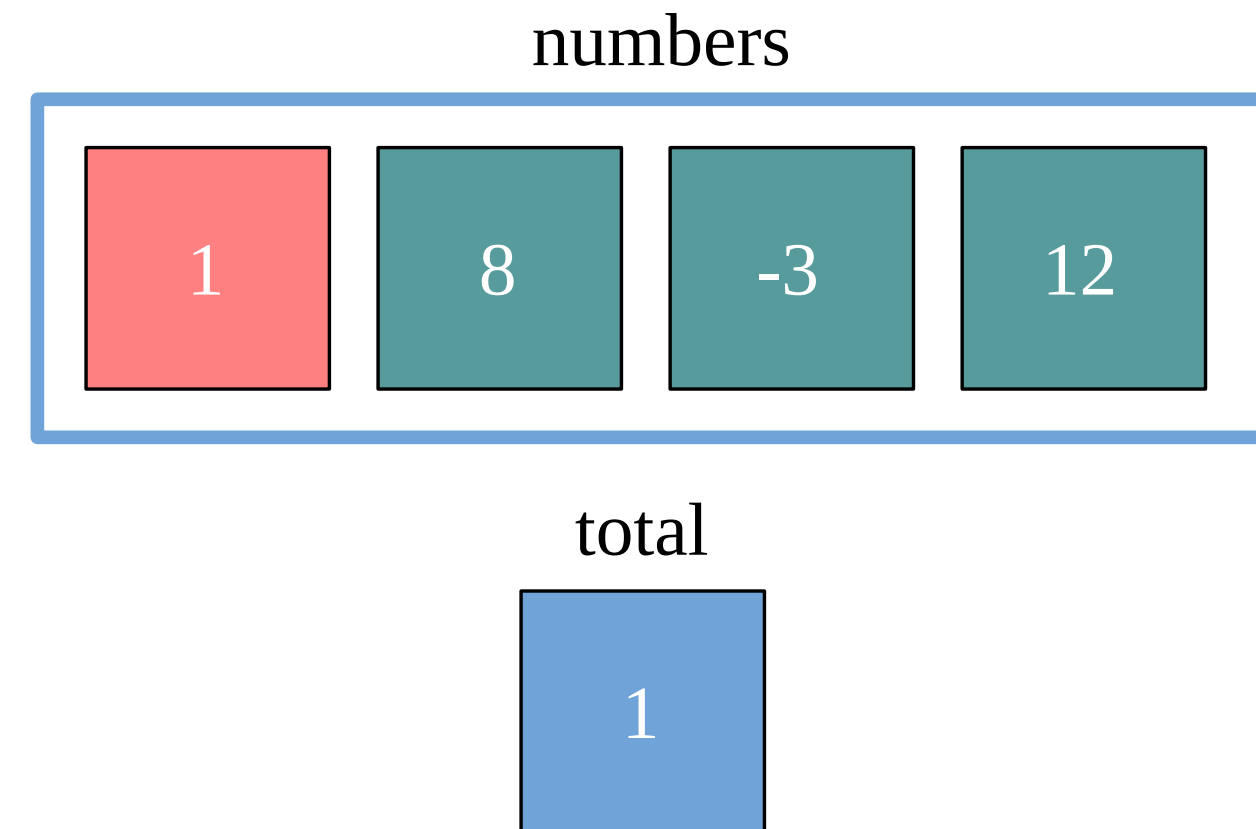
For loop with mutable state

```
def sum(numbers: List[Int]): Int = {  
  var total = 0  
  
  for (number <- numbers)  
    total += number  
  
  total  
}
```



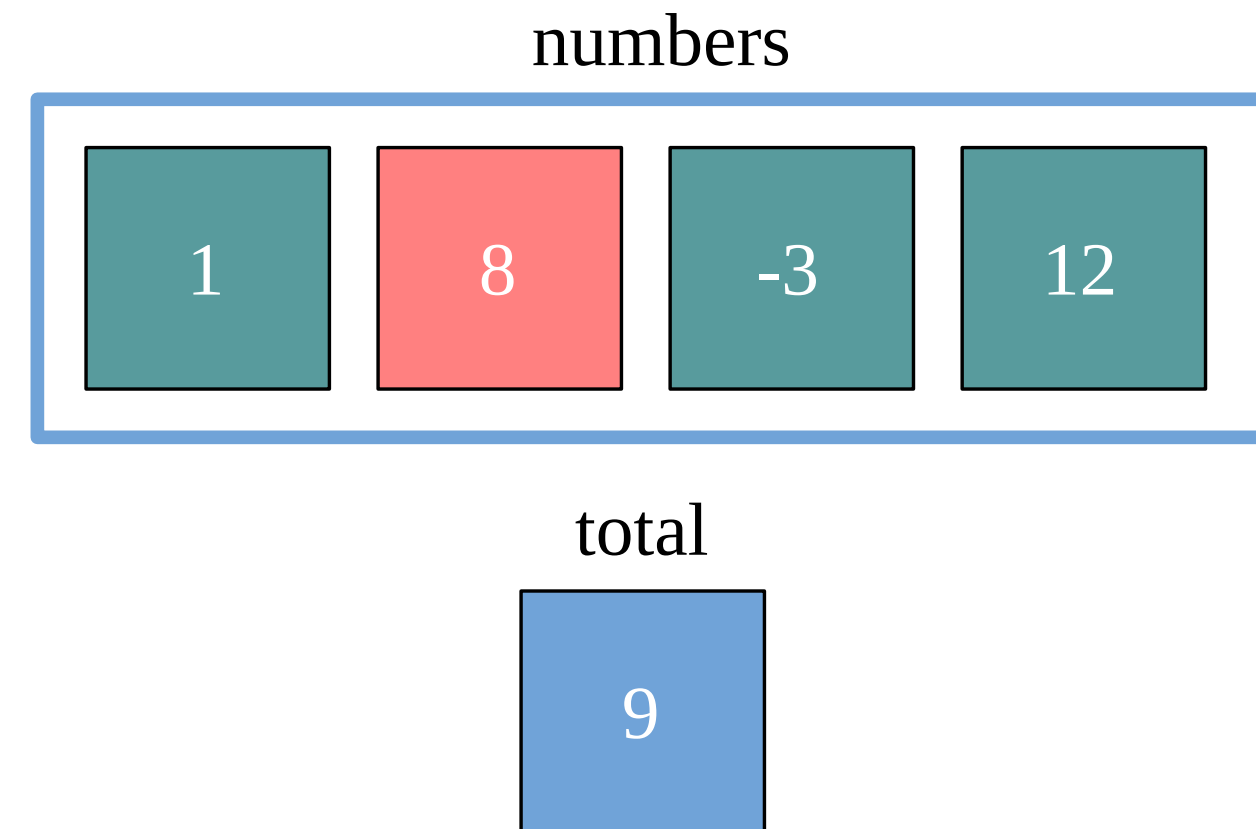
For loop with mutable state

```
def sum(numbers: List[Int]): Int = {  
  var total = 0  
  
  for (number <- numbers)  
    total += number  
  
  total  
}
```



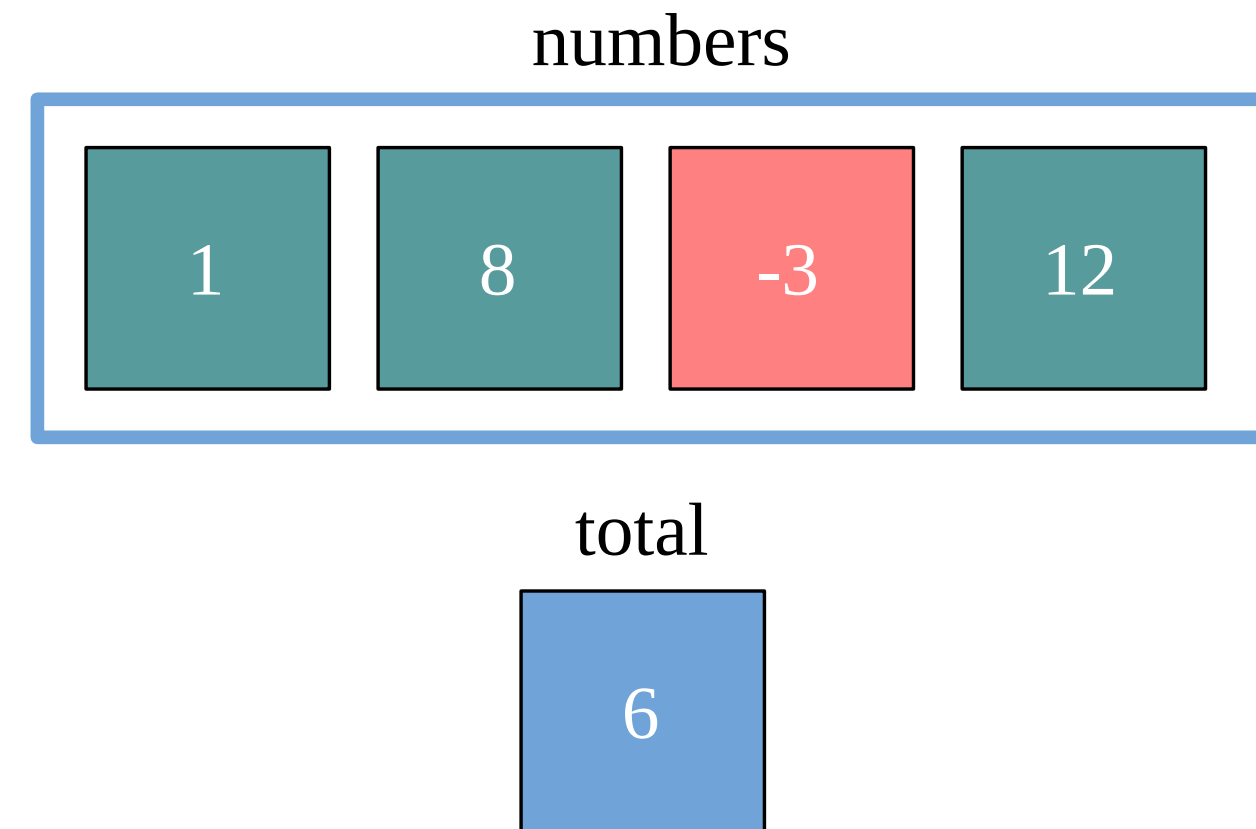
For loop with mutable state

```
def sum(numbers: List[Int]): Int = {  
  var total = 0  
  
  for (number <- numbers)  
    total += number  
  
  total  
}
```



For loop with mutable state

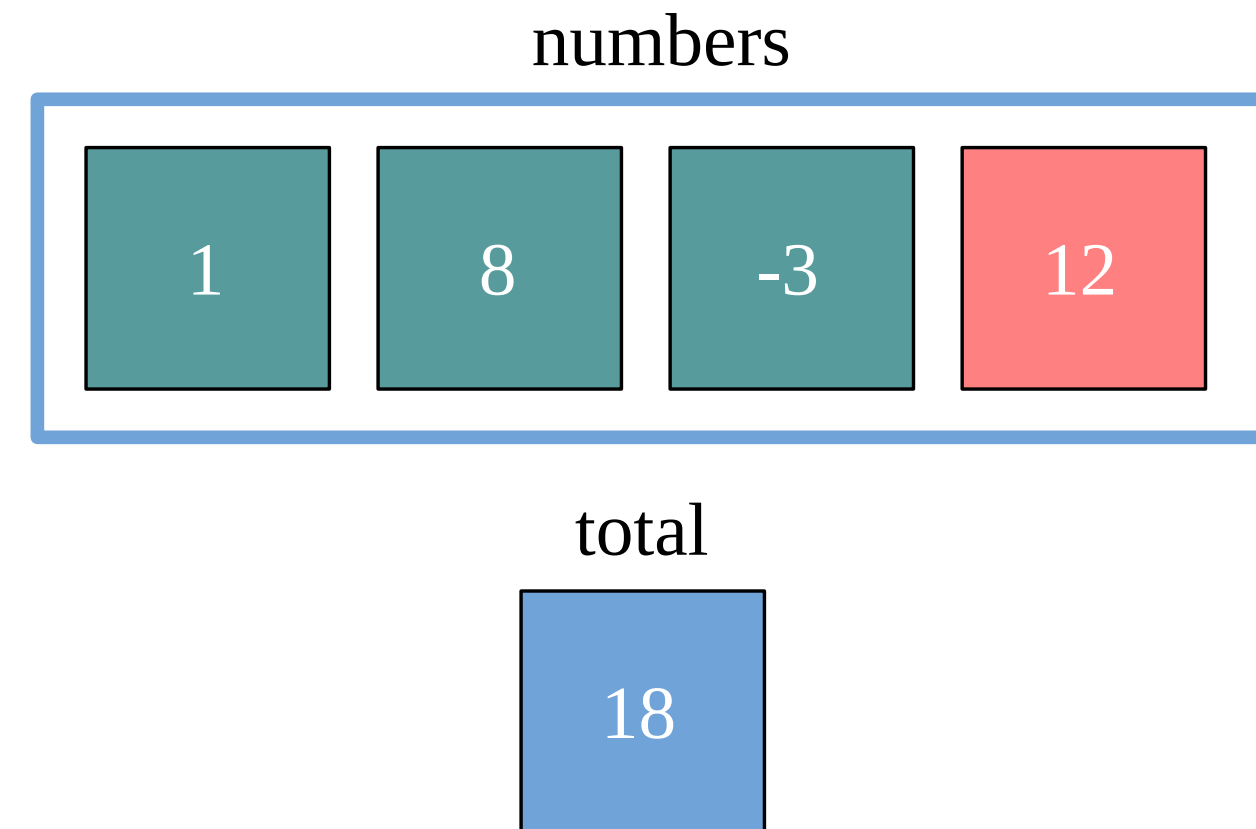
```
def sum(numbers: List[Int]): Int = {  
  var total = 0  
  
  for (number <- numbers)  
    total += number  
  
  total  
}
```



For loop with mutable state

```
def sum(numbers: List[Int]): Int = {  
  var total = 0  
  
  for (number <- numbers)  
    total += number  
  
  total  
}
```

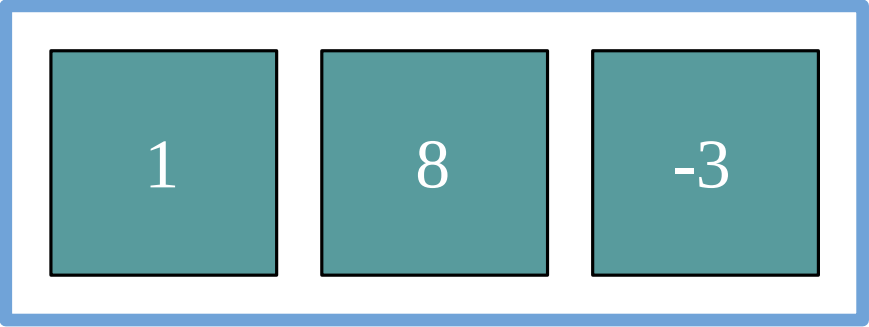
```
sum(List(1, 8, -3, 12))  
// res20: Int = 18
```



The background of the slide features a complex, abstract network of light blue lines and dots. The dots, representing nodes, vary in size and are connected by thin, intersecting lines that form a web-like structure across the entire page. The overall aesthetic is clean and modern, with a light blue color palette.

ForLoopExercises.scala

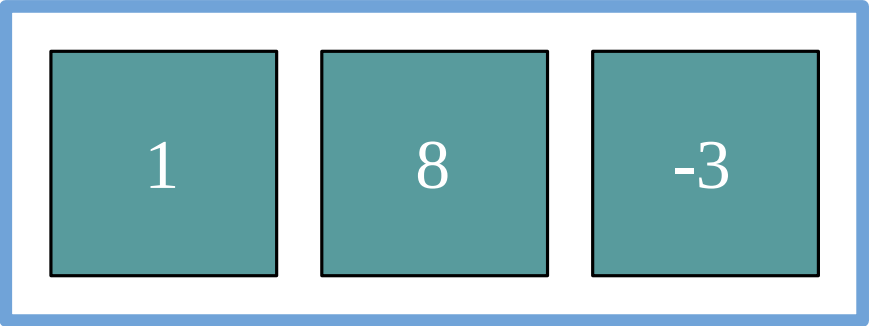
sum



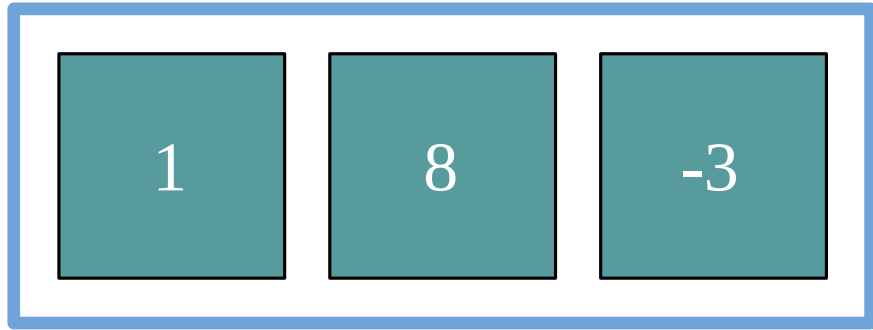
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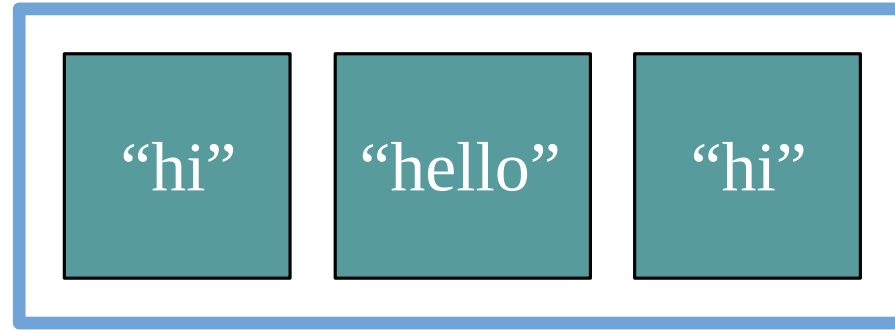
min



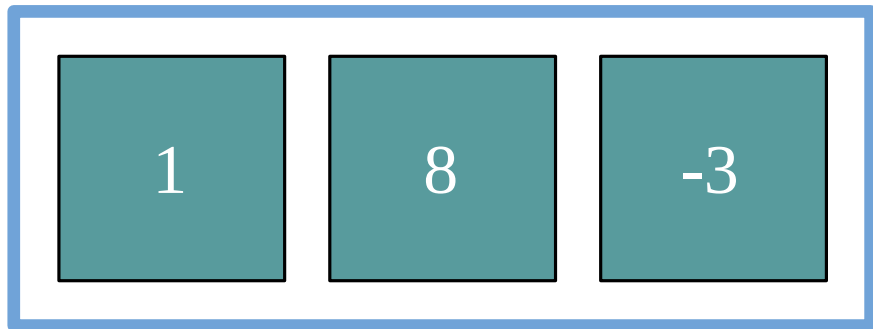
sum



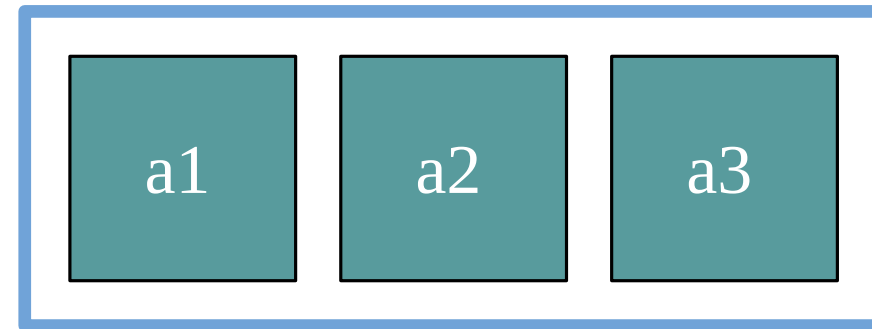
wordCount



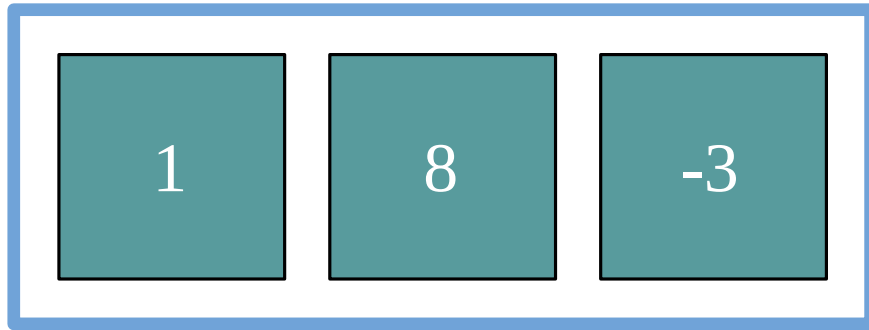
min



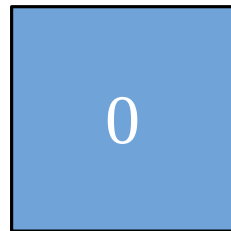
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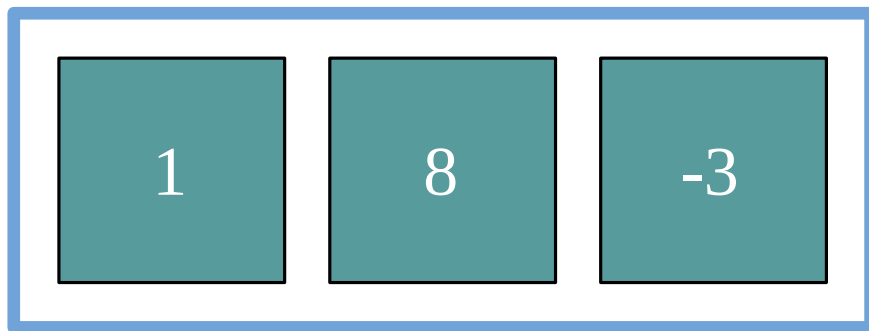
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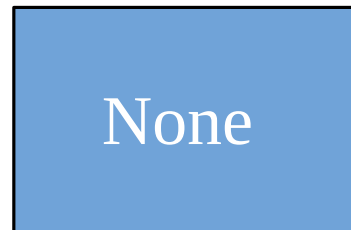
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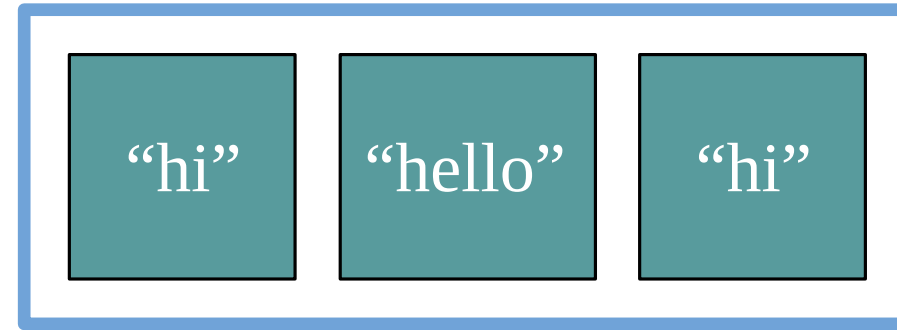
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state



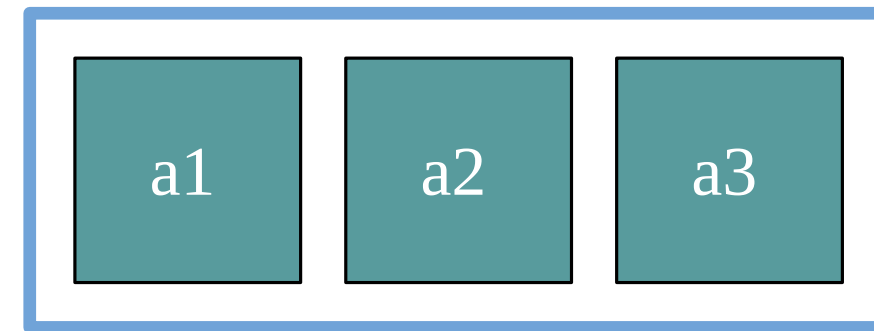
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state



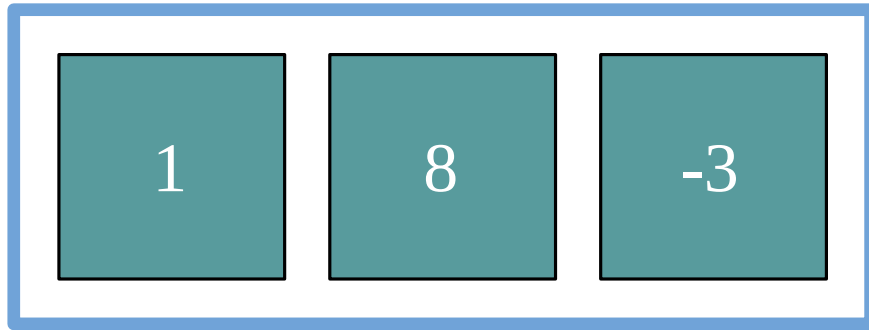
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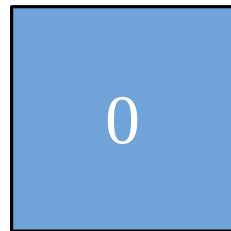
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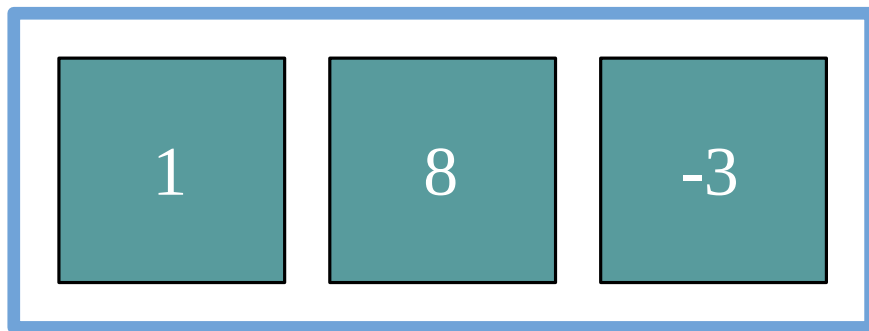
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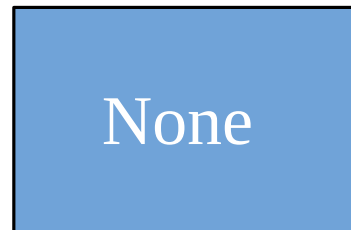
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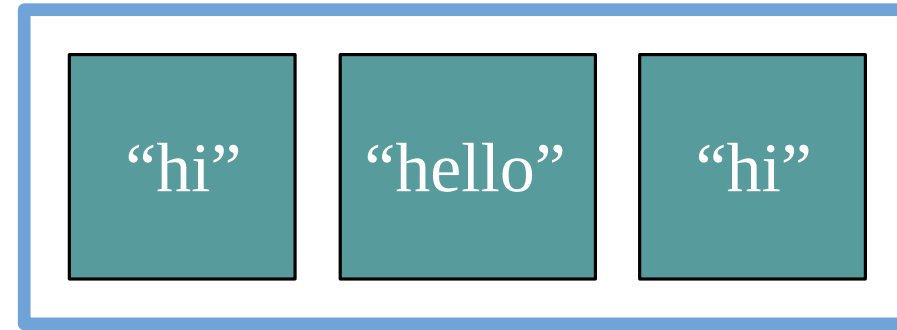
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state



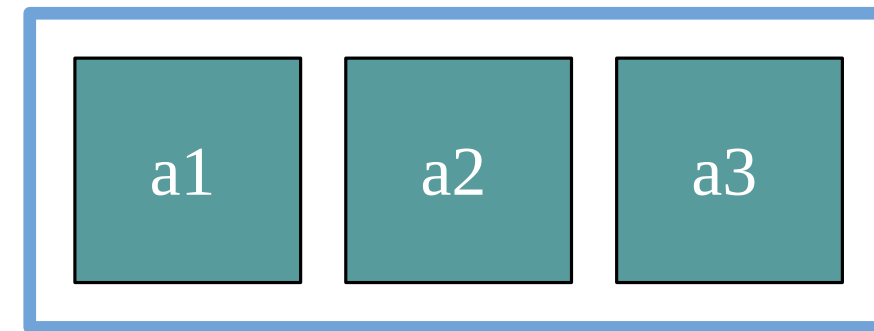
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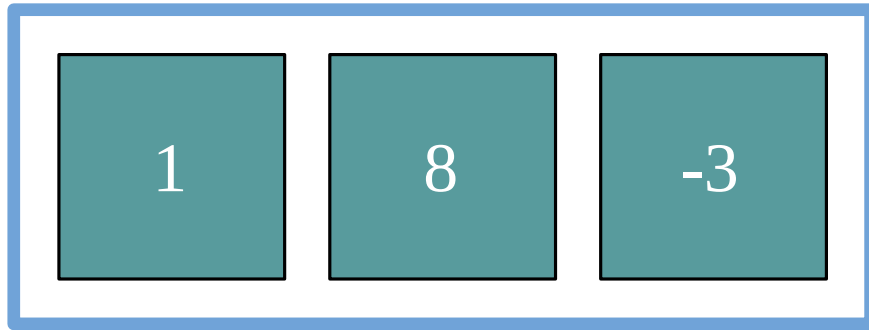
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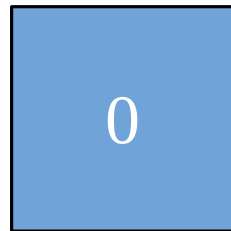
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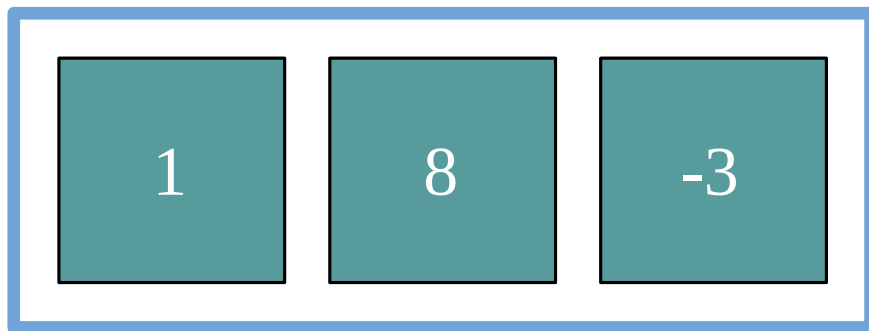
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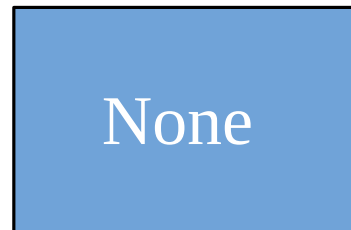
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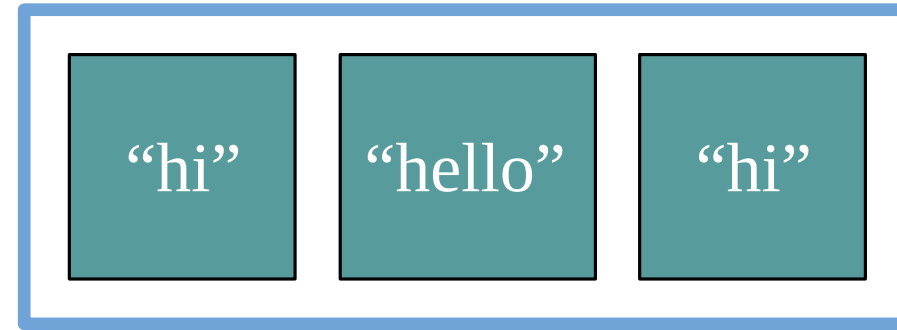
min



state



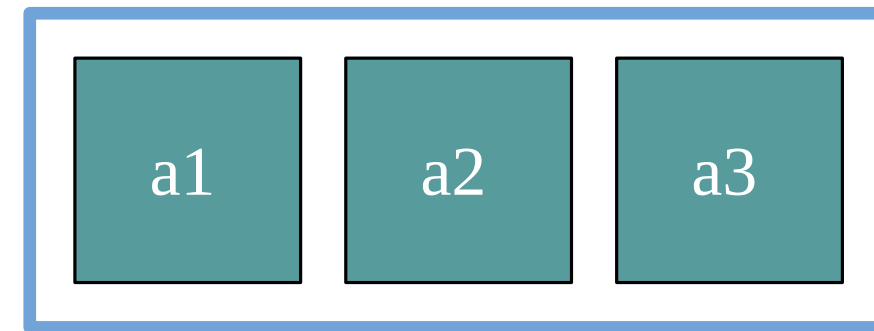
wordCount



state

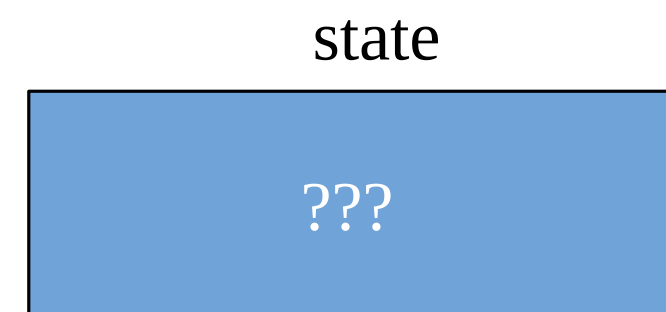
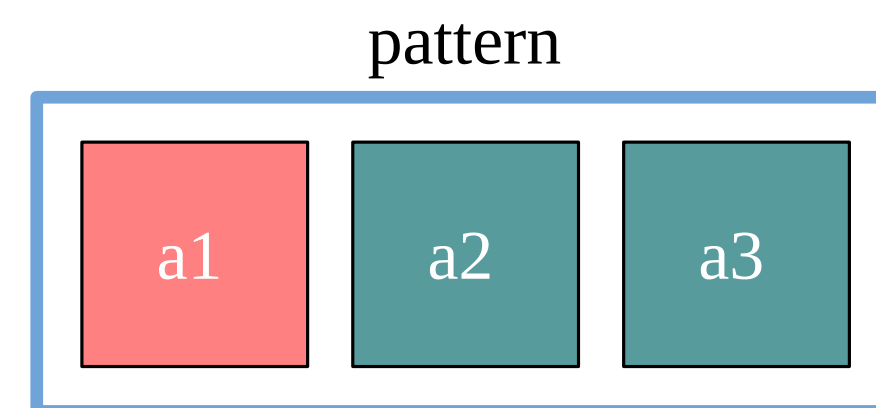
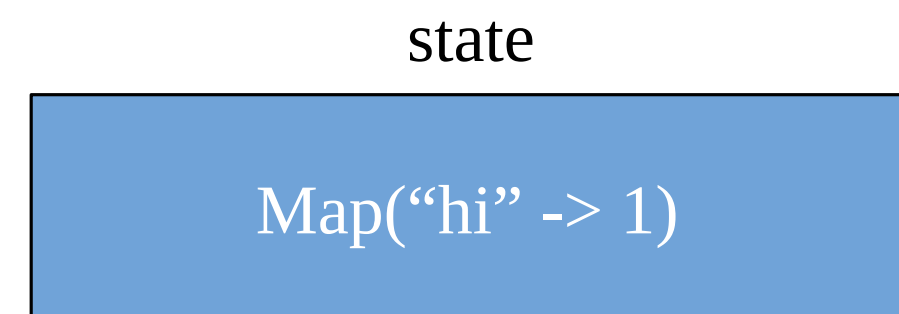
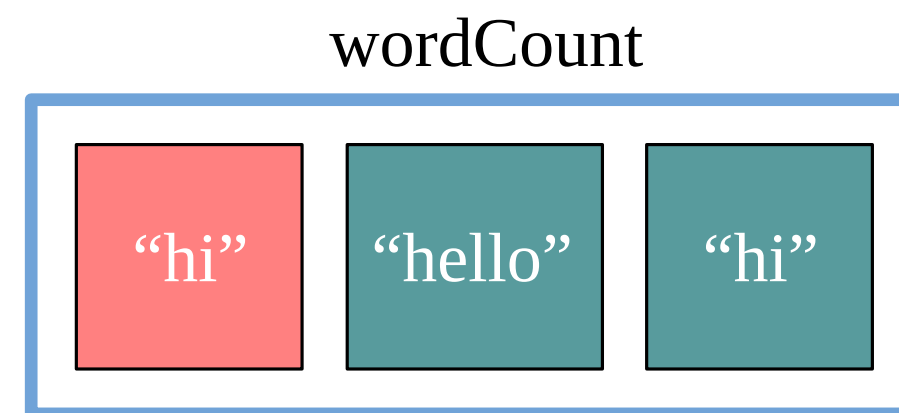
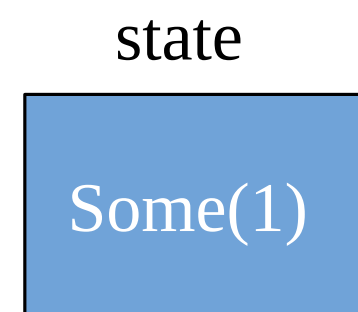
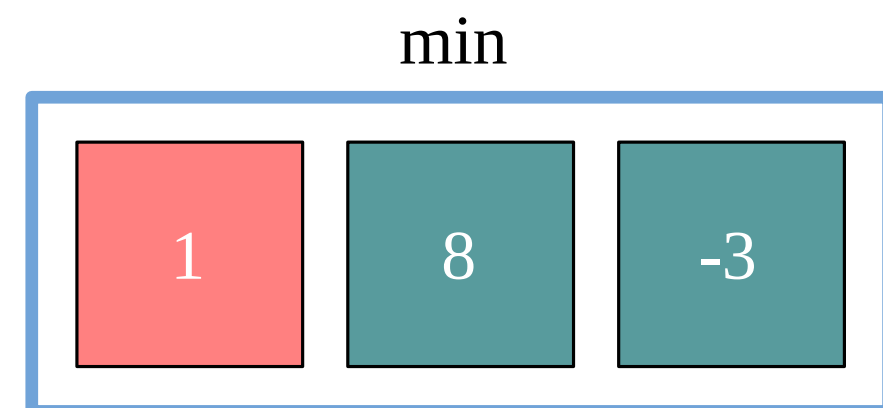
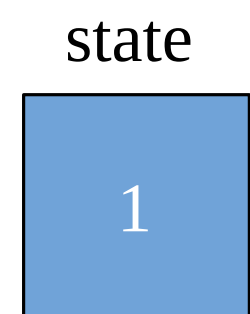
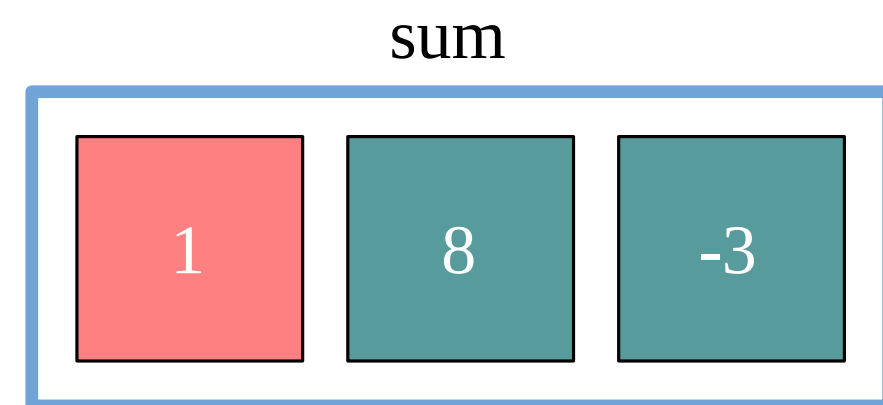


pattern

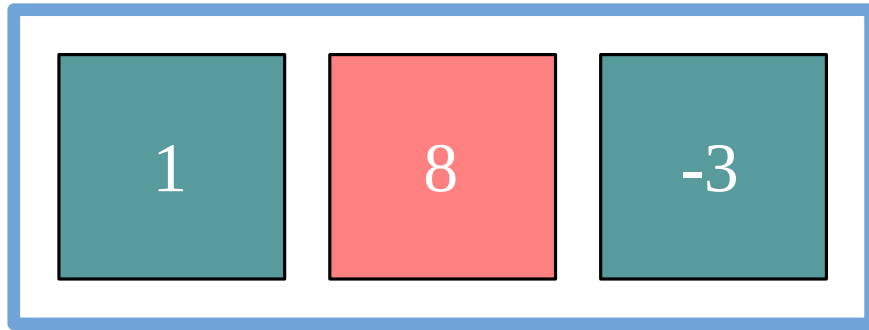


state

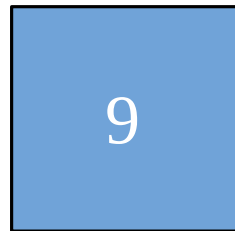




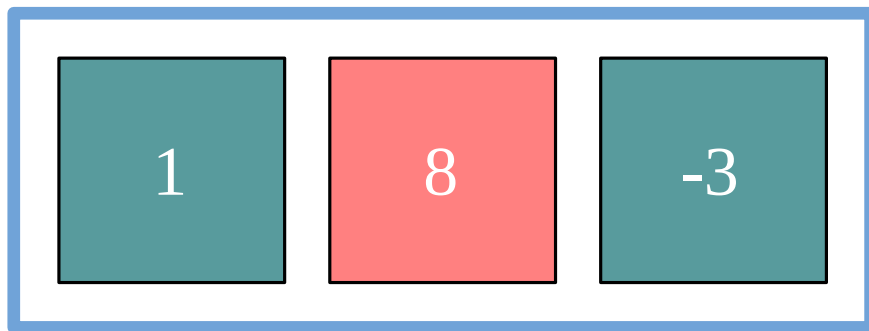
sum



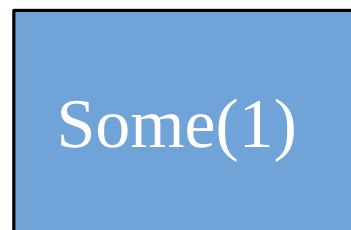
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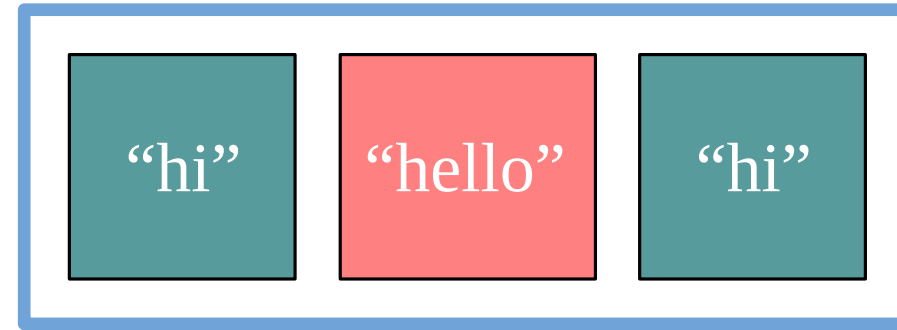
min



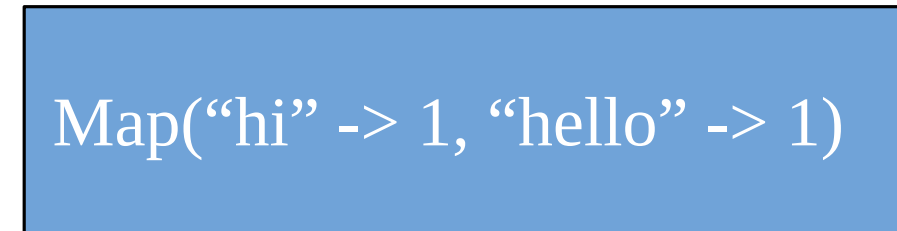
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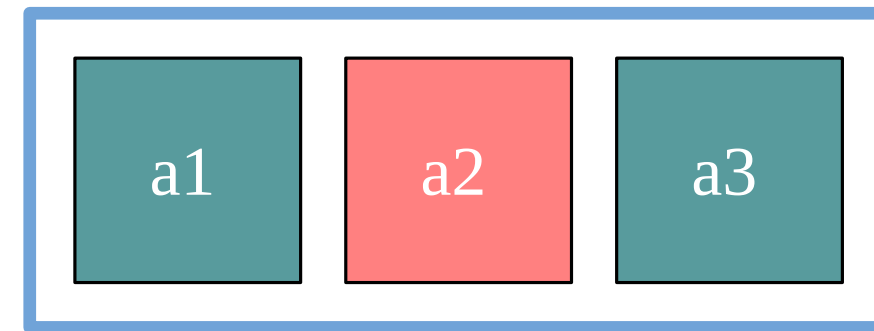
wordCount



state



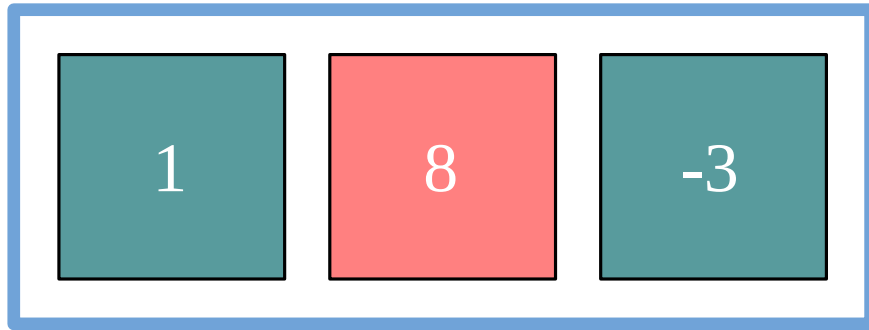
pattern



state



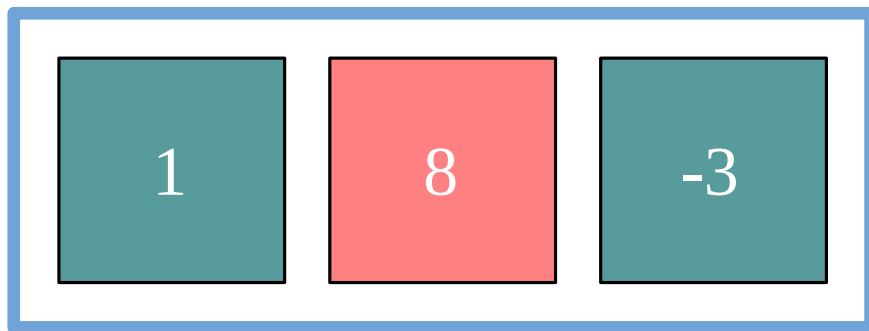
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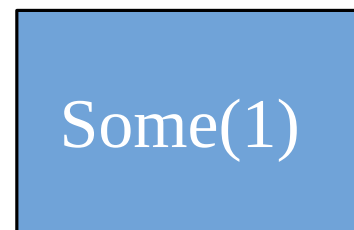
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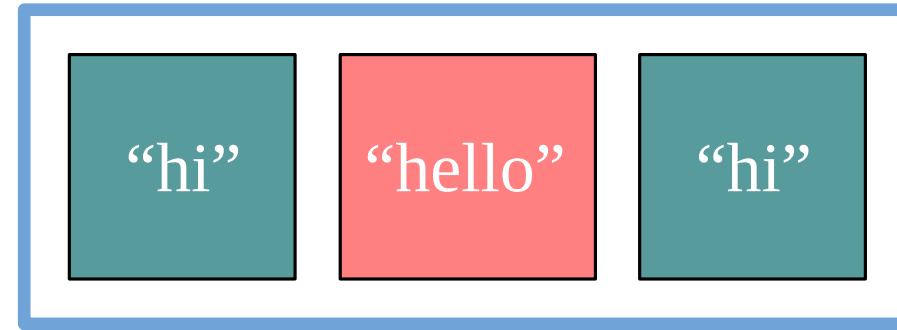
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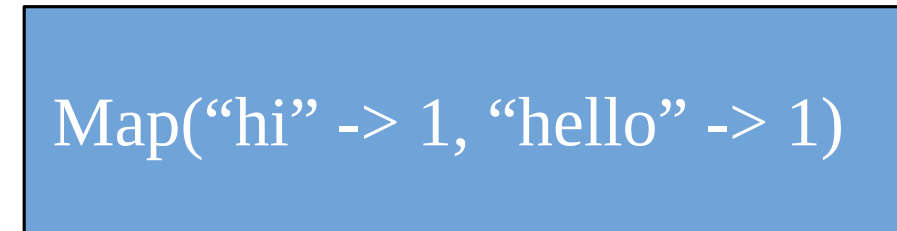
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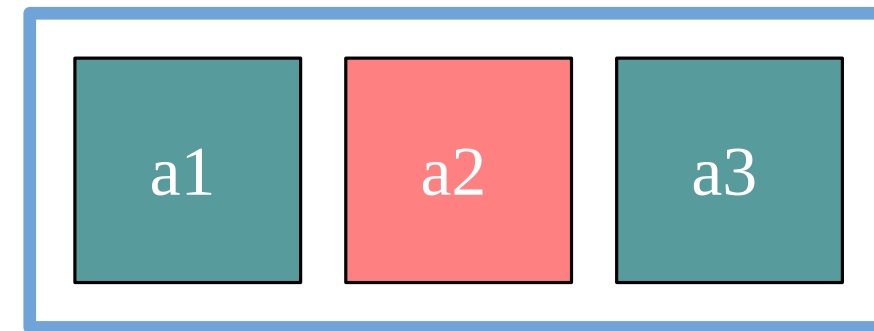
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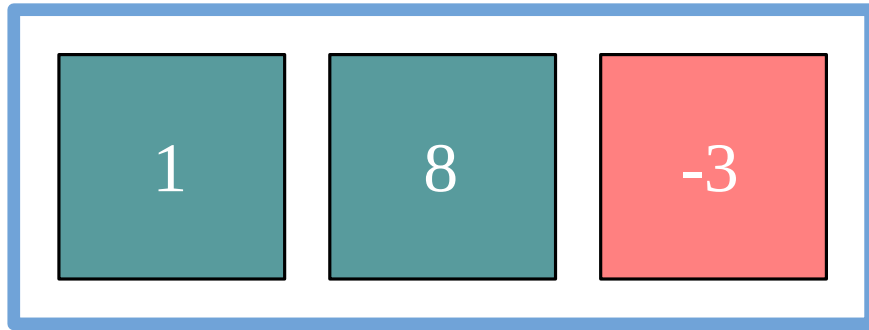
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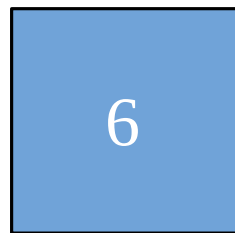
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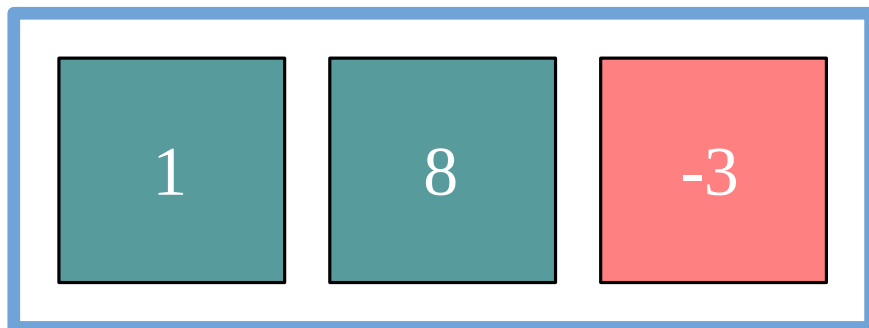
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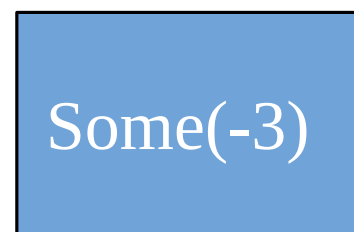
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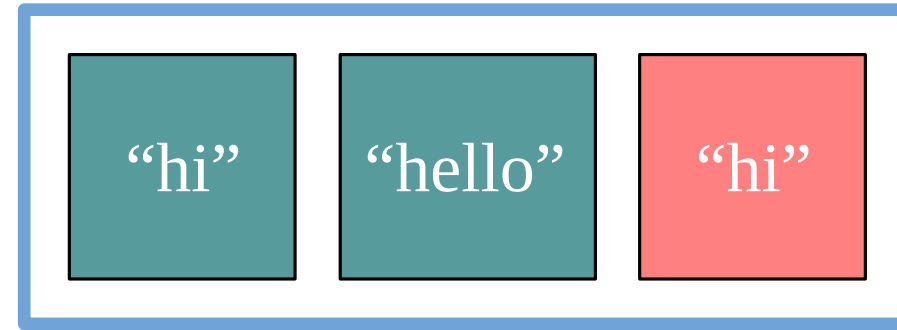
min



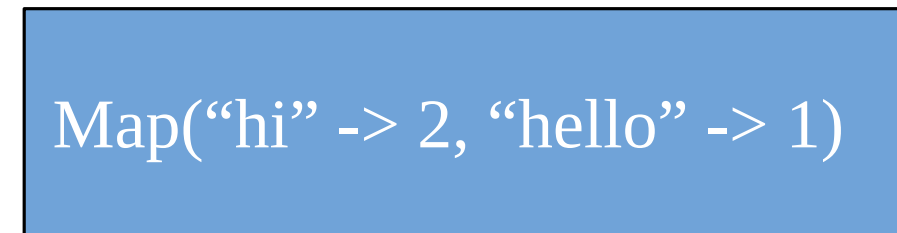
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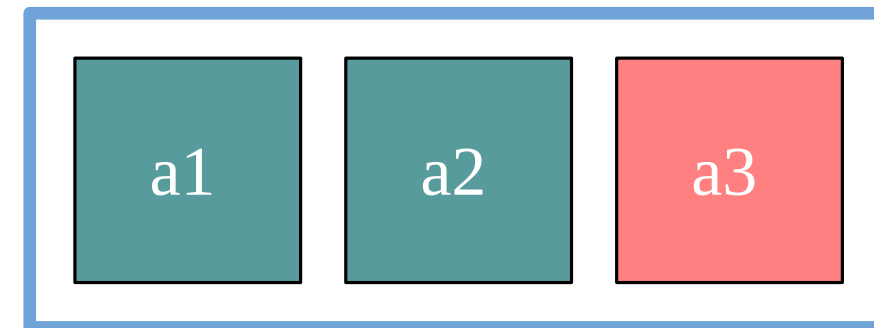
wordCount



state



pattern



state



The background features a complex network of blue dots of varying sizes connected by thin, light blue lines. The dots are scattered across the frame, with some forming dense clusters and others standing alone. The lines create a web-like pattern that fills the entire background, giving it a technical or digital feel.

ForLoopExercises.scala

Summary

- For loop syntax
- Iterate over a List
- foldLeft