



# ITERATION WITH FOR LOOP

# 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
```

## Probably 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)
```

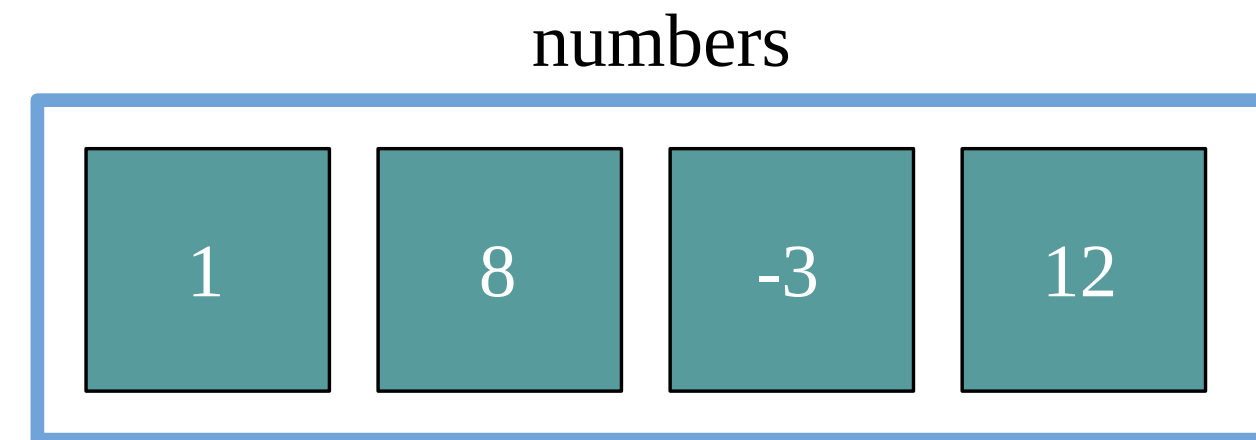
```
for {
  shape <- shapes
  number <- point
} println(s"There is $number ${shape}(s)")
// There is 2 triangle(s)
// There is 5 triangle(s)
// There is 2 square(s)
// There is 5 square(s)
```

```
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

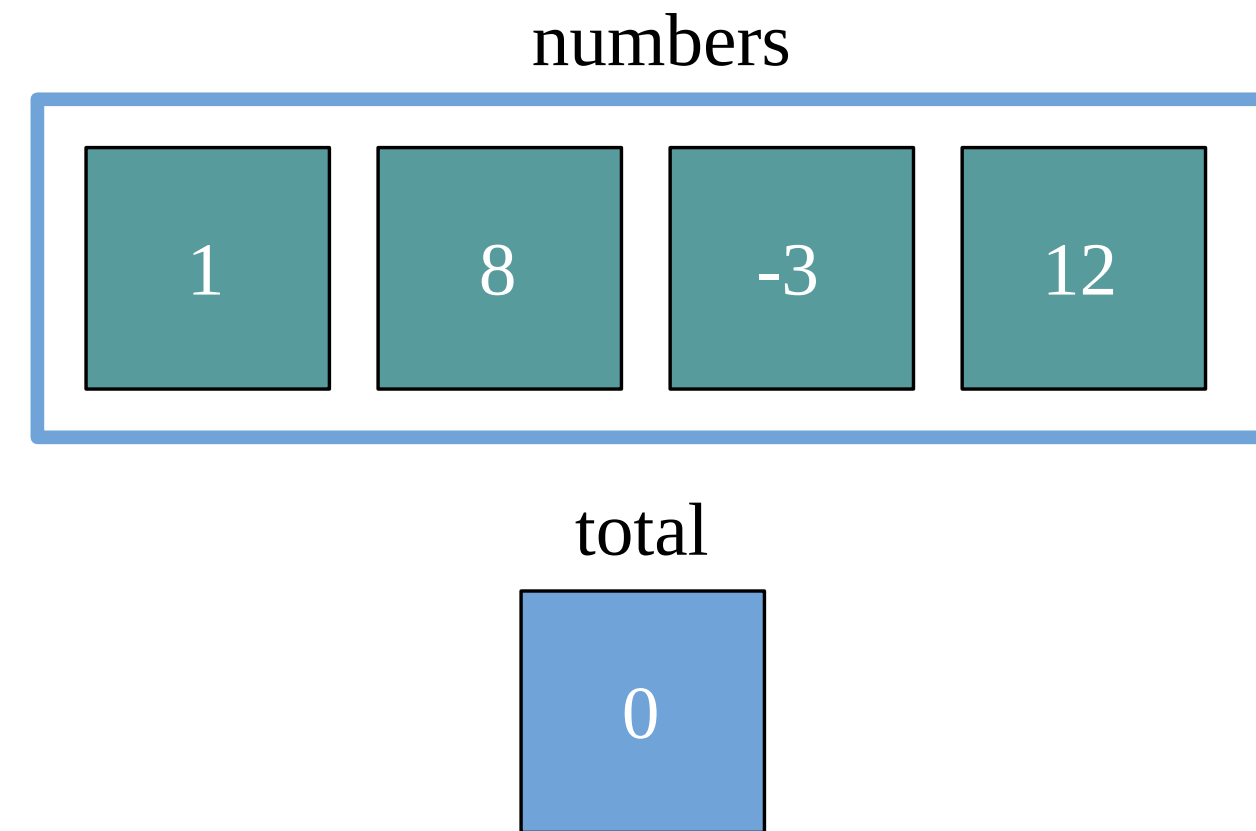
```
def sum(numbers: List[Int]): Int
```

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



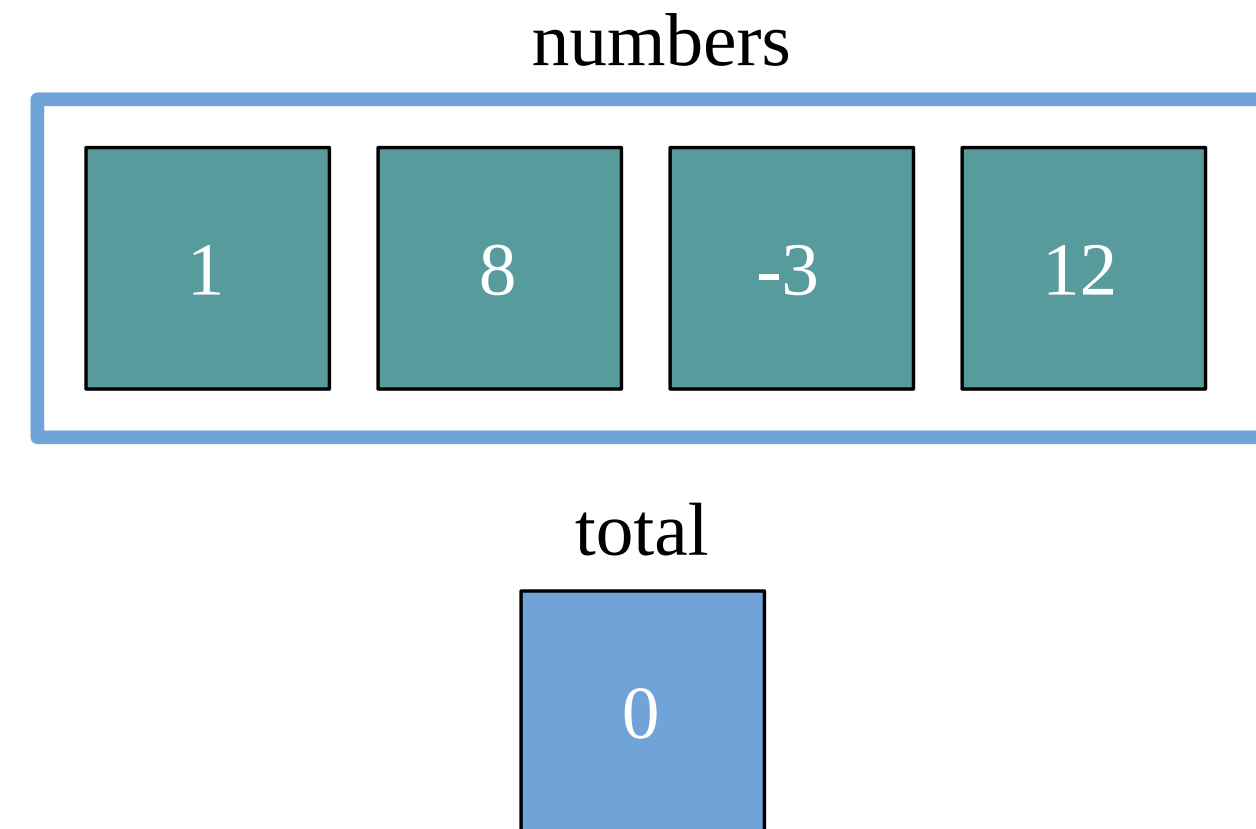
# For loop with mutable state

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



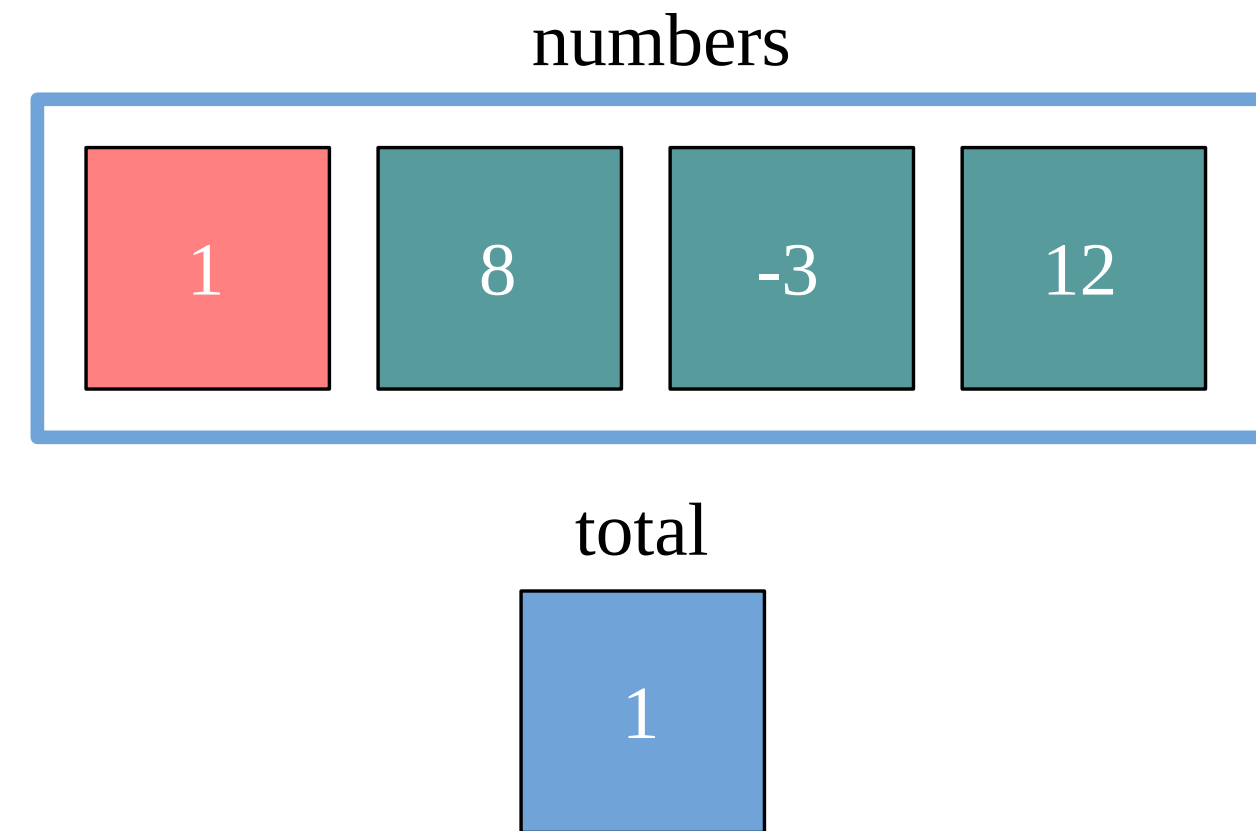
# For loop with mutable state

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



# For loop with mutable state

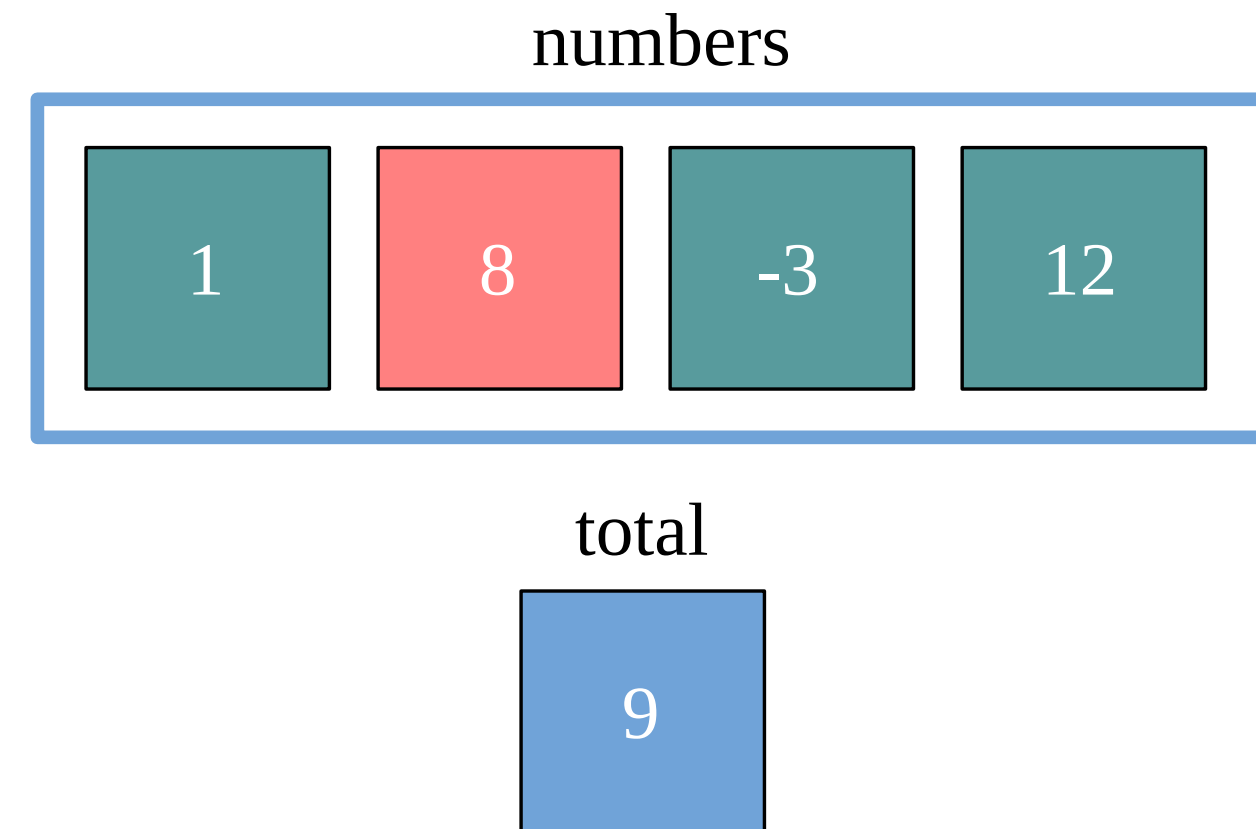
```
def sum(numbers: List[Int]): Int = {  
  var total = 0  
  
  for (number <- numbers)  
    total += number  
  
  total  
}
```





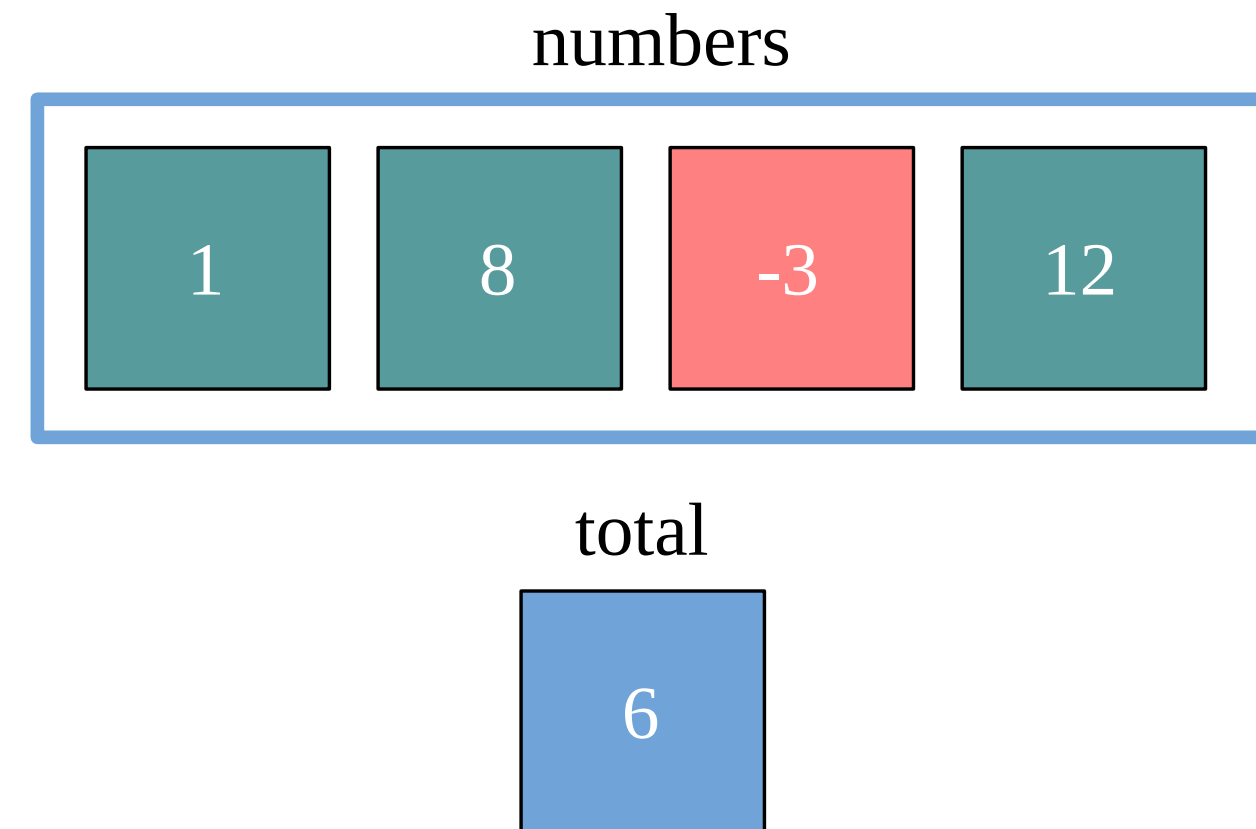
# For loop with mutable state

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



# For loop with mutable state

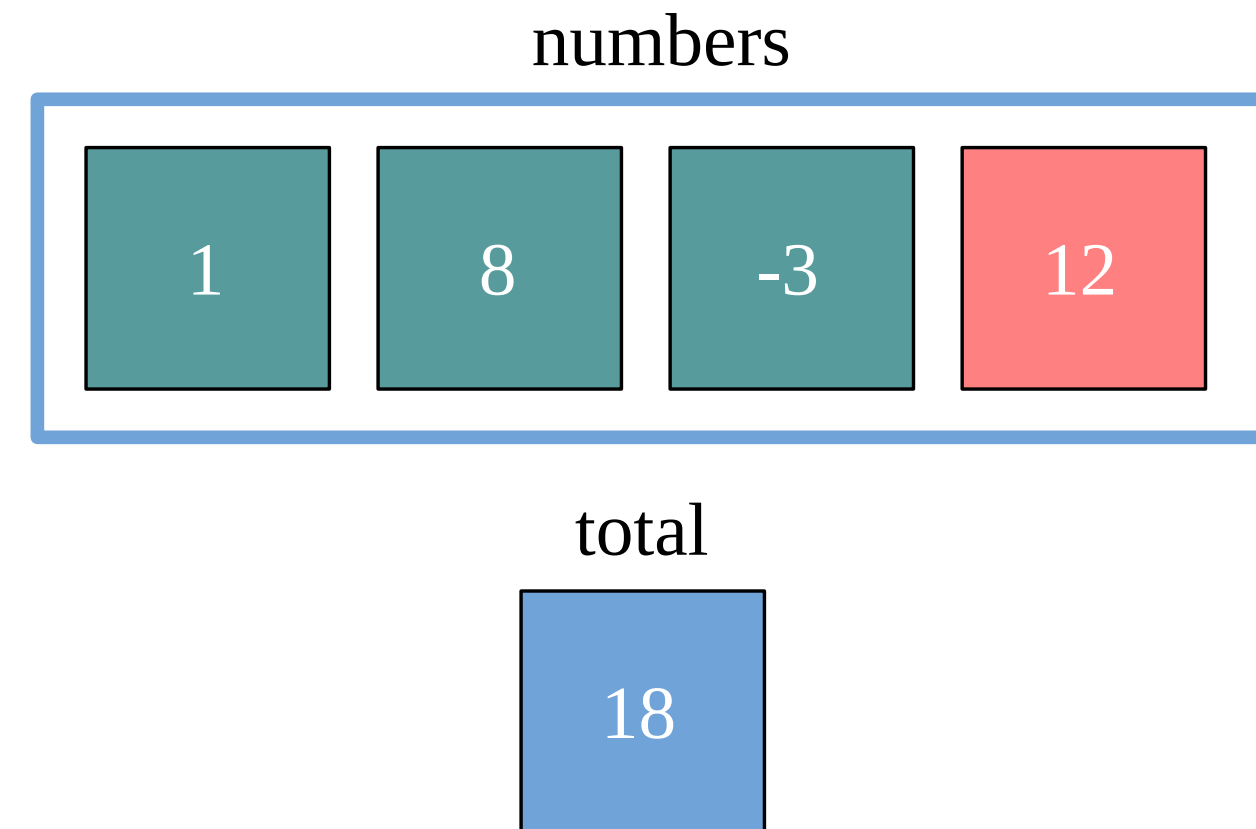
```
def sum(numbers: List[Int]): Int = {  
  var total = 0  
  
  for (number <- numbers)  
    total += number  
  
  total  
}
```



# For loop with mutable state

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

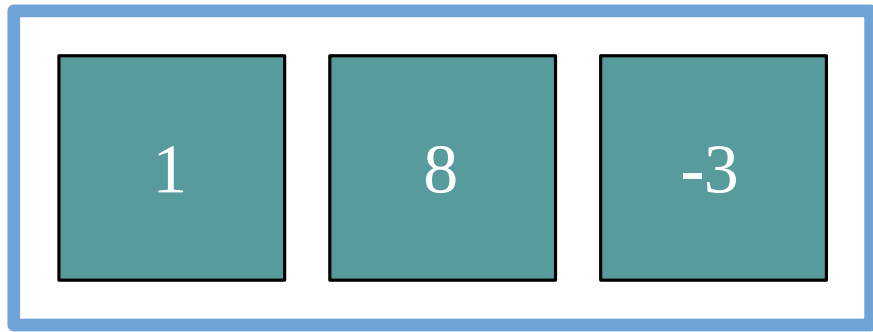
```
sum(List(1, 8, -3, 12))  
// res20: Int = 18
```



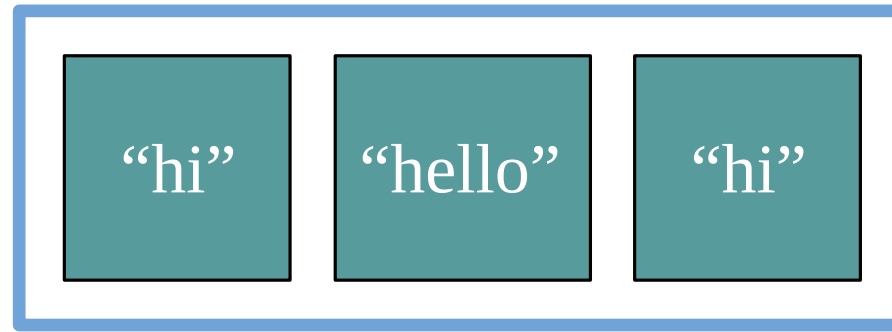
The background of the slide is a light blue gradient with a complex network of thin, light blue lines connecting various circular nodes. The nodes are also light blue and vary in size. The network is most dense in the top-left and bottom-right corners, with lines crisscrossing and nodes clustered together. In the center, the text 'ForLoopExercises.scala' is displayed in a dark teal, sans-serif font.

**ForLoopExercises.scala**

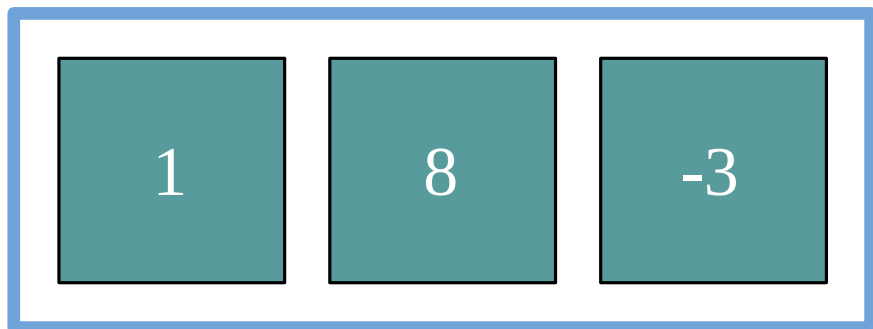
sum



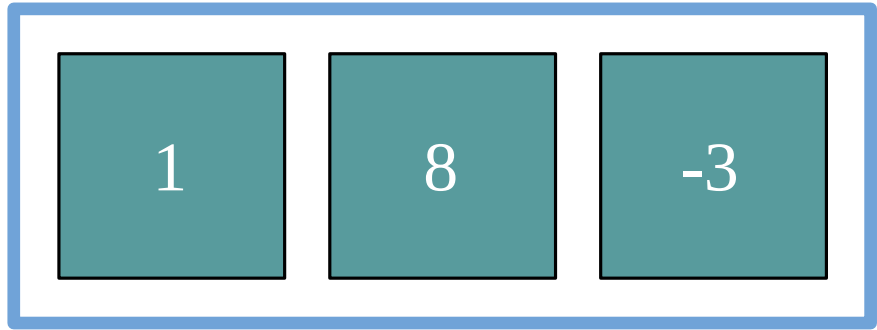
wordCount



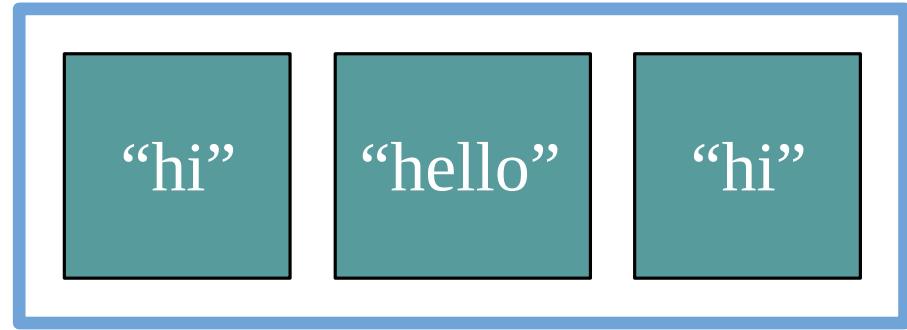
min



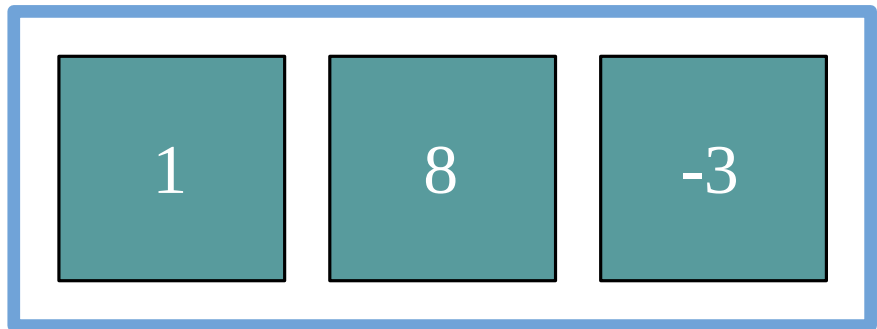
sum



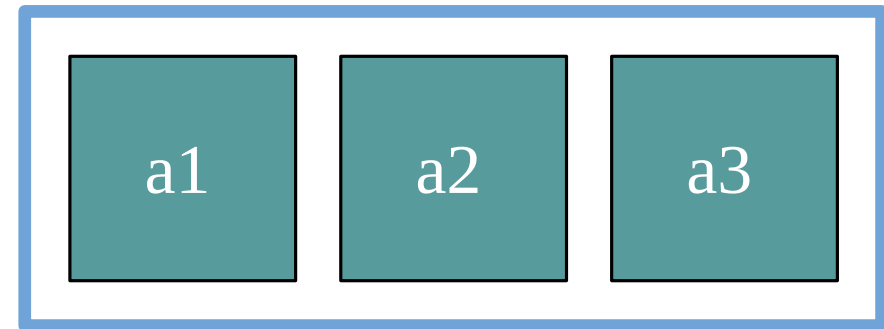
wordCount



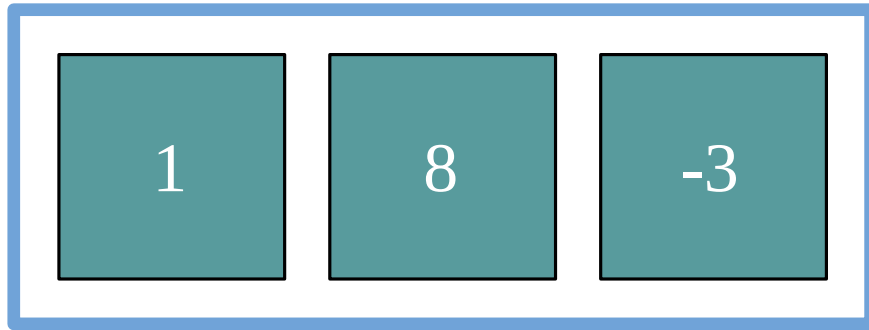
min



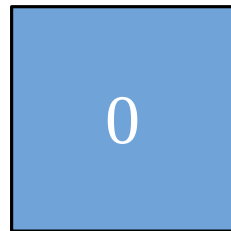
pattern



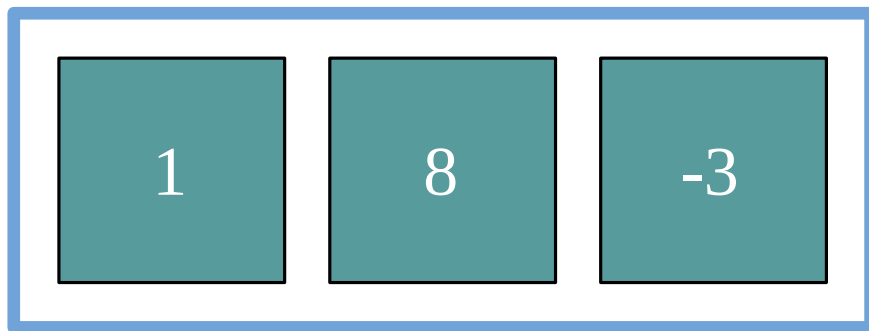
sum



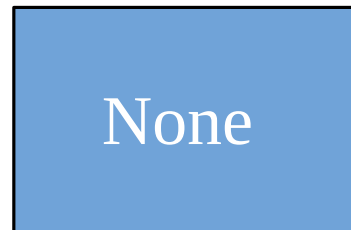
state



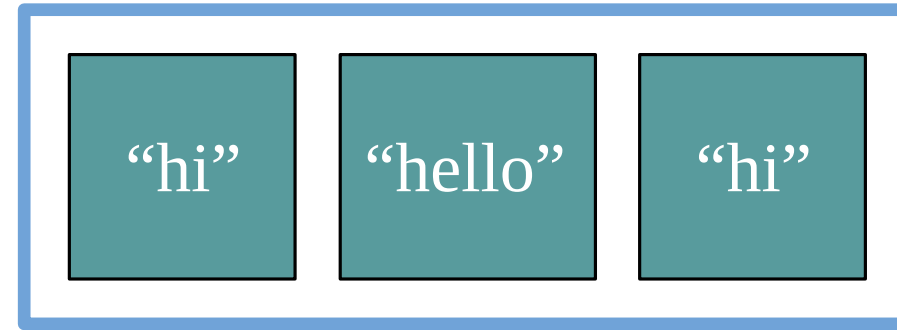
min



state



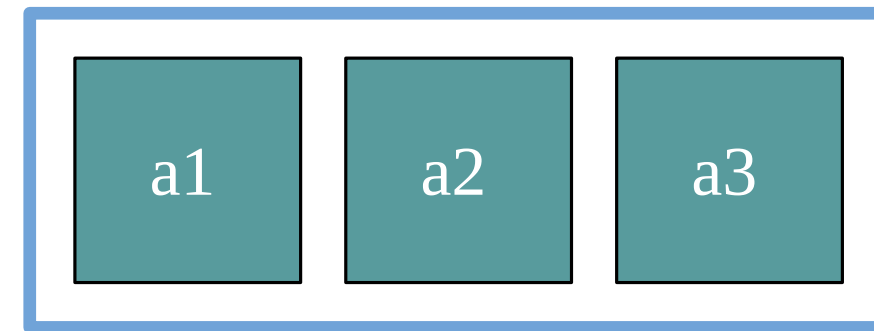
wordCount



state



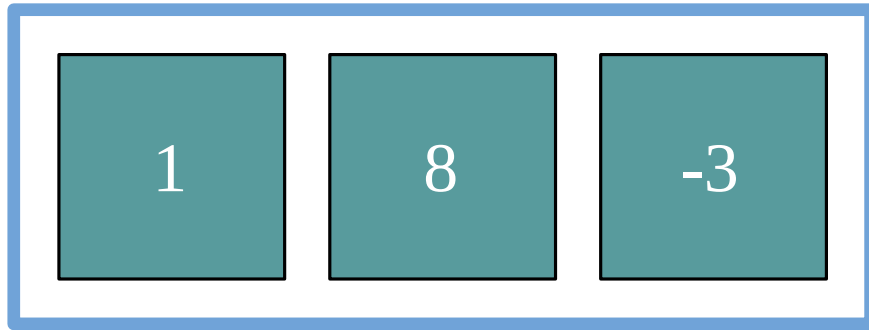
pattern



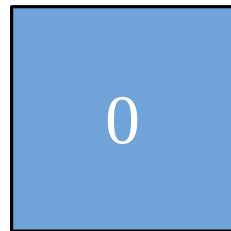
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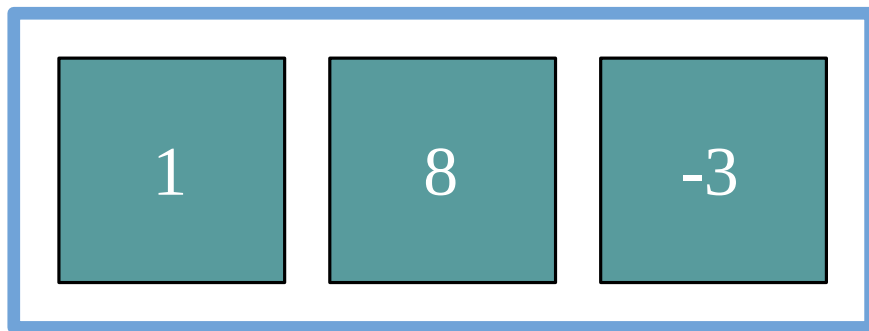
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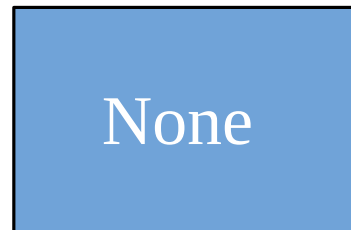
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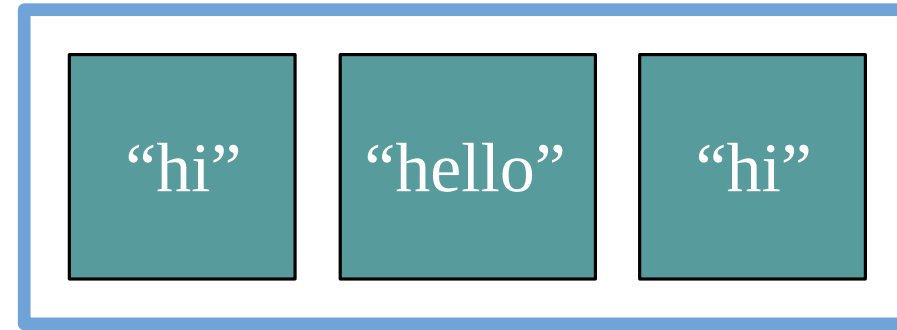
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state



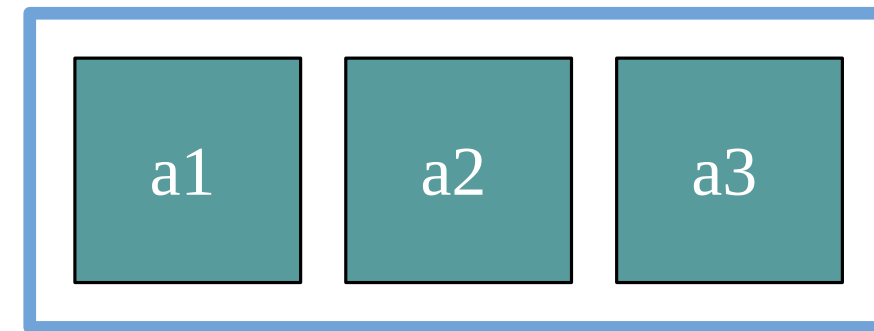
wordCount



state



pattern

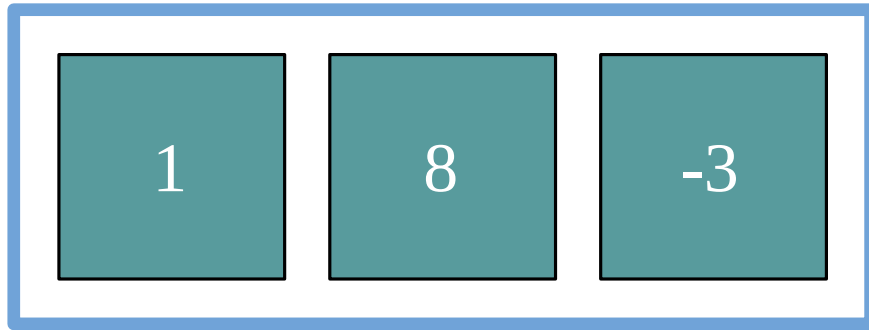


state

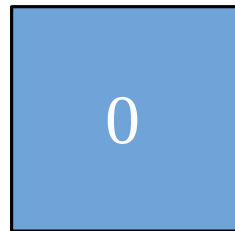




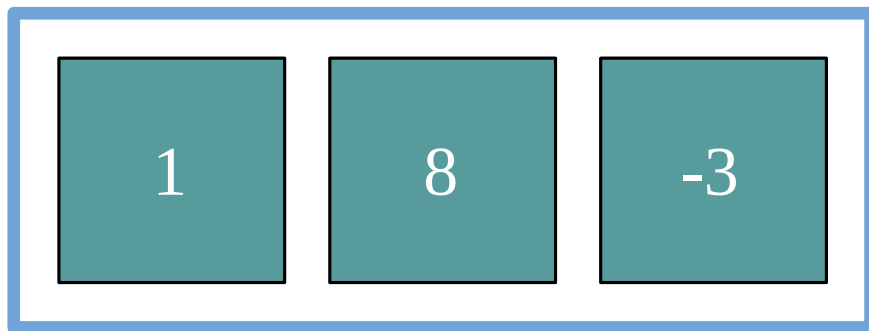
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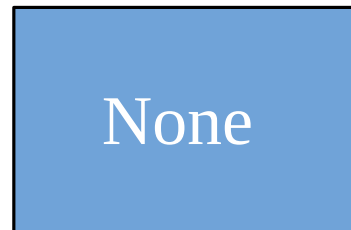
state



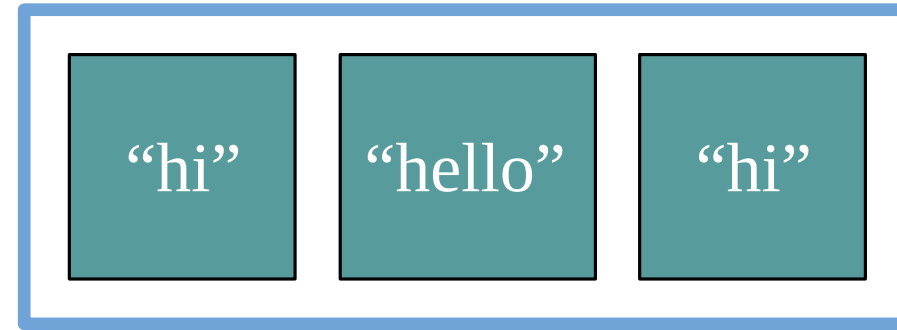
min



state



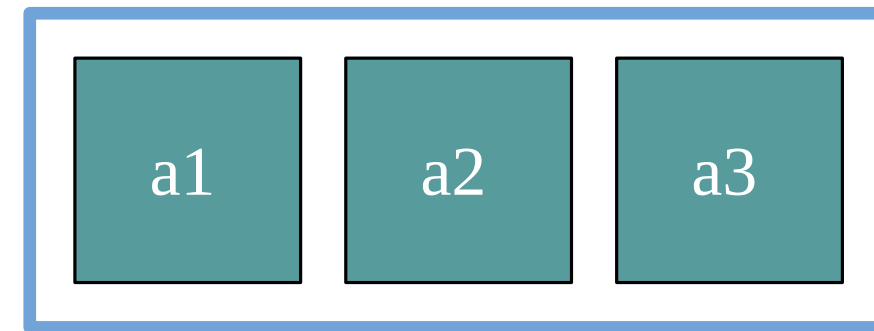
wordCount



state



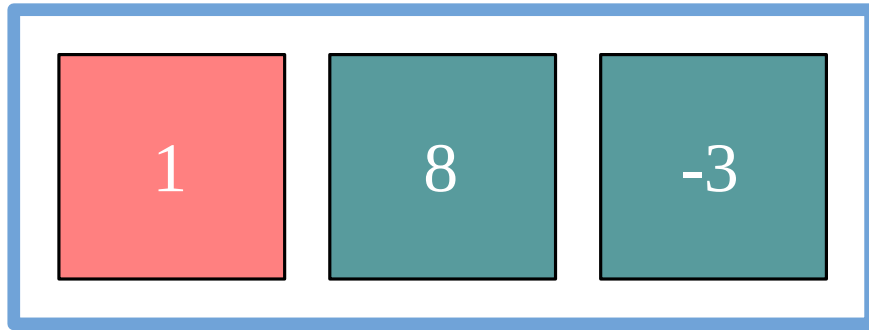
pattern



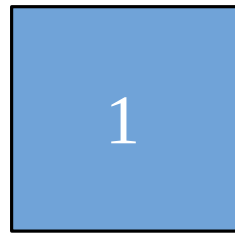
state



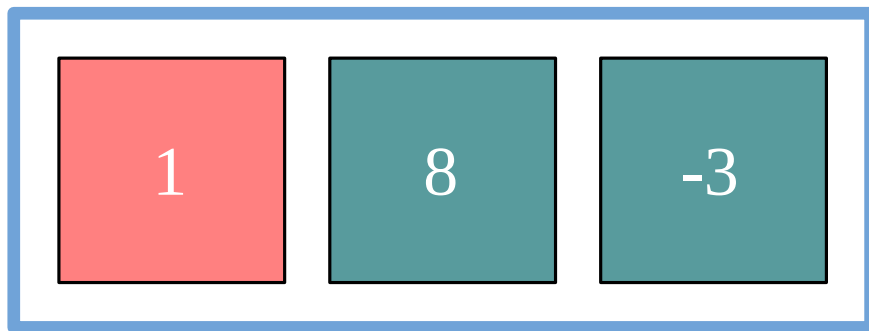
sum



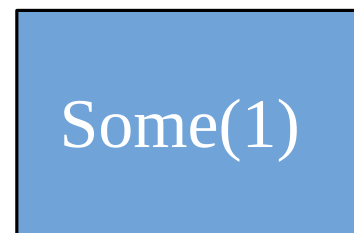
state



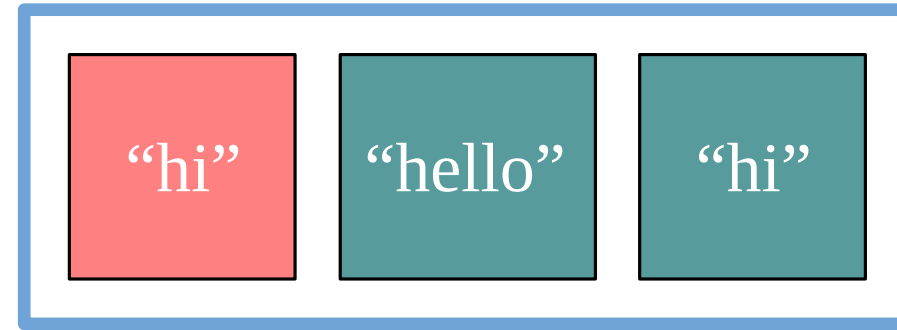
min



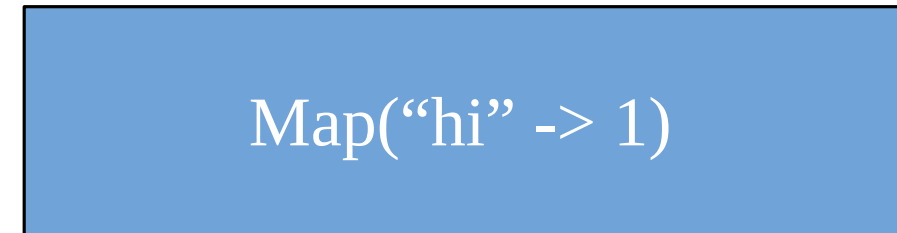
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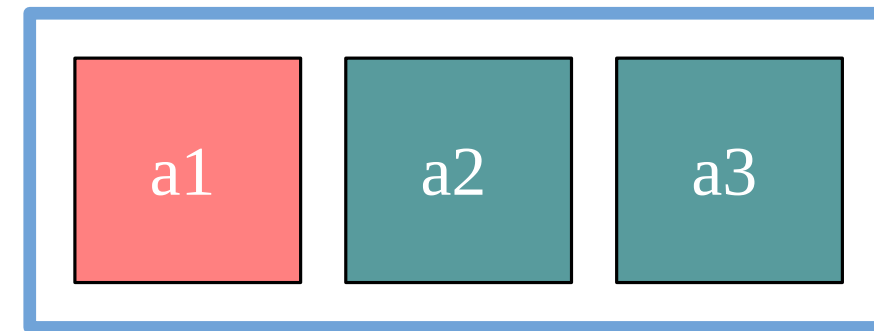
wordCount



state



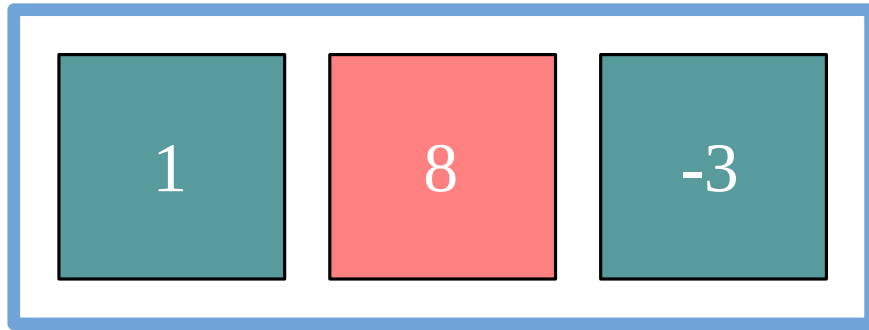
pattern



state



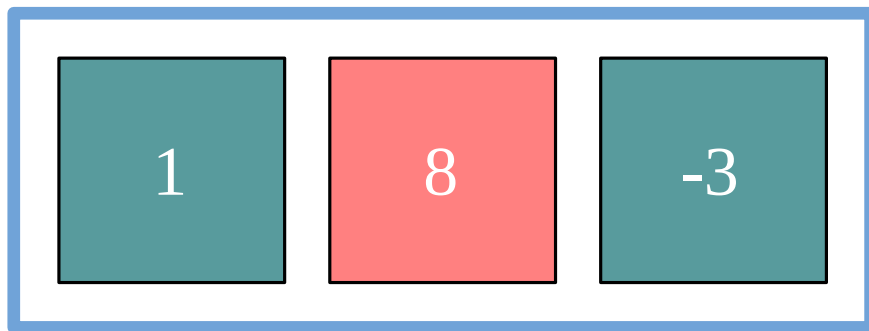
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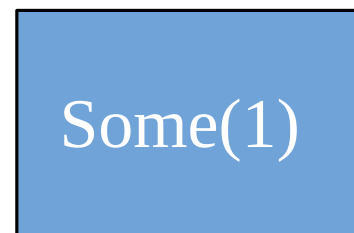
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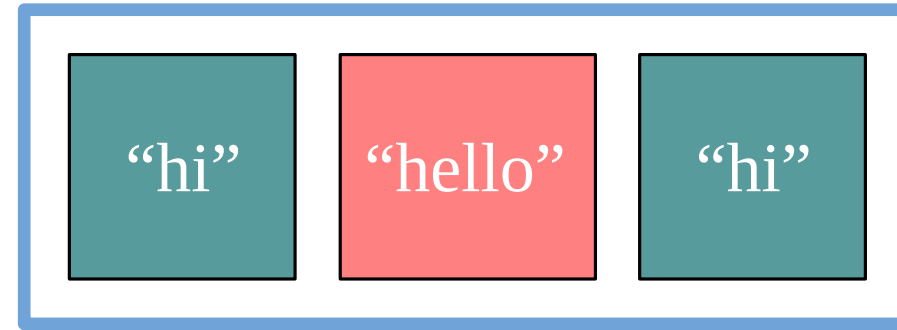
min



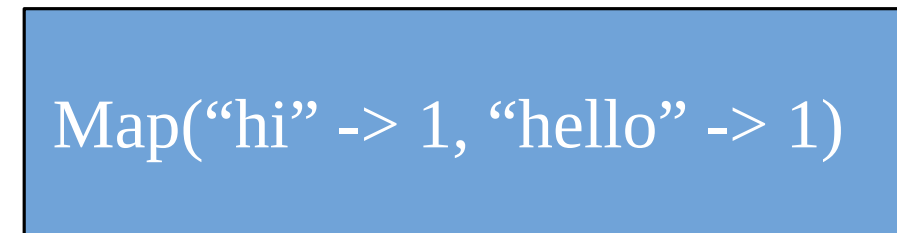
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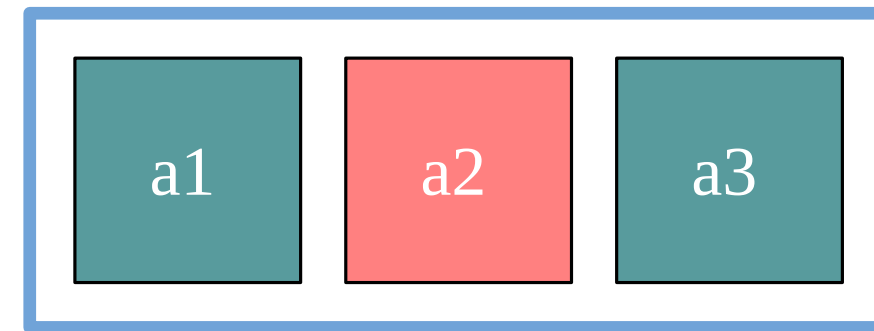
wordCount



state



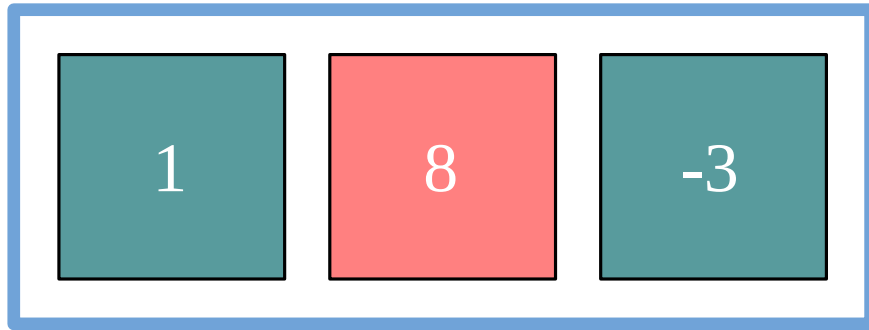
pattern



state



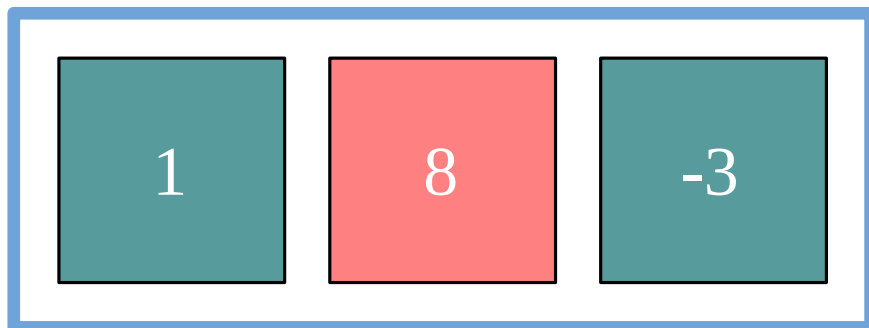
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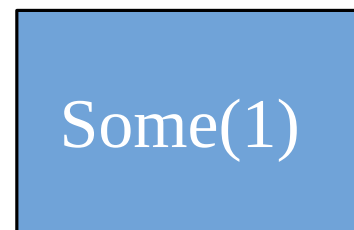
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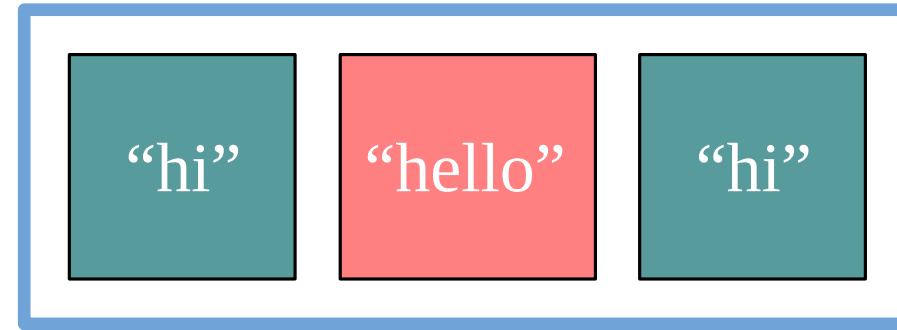
min



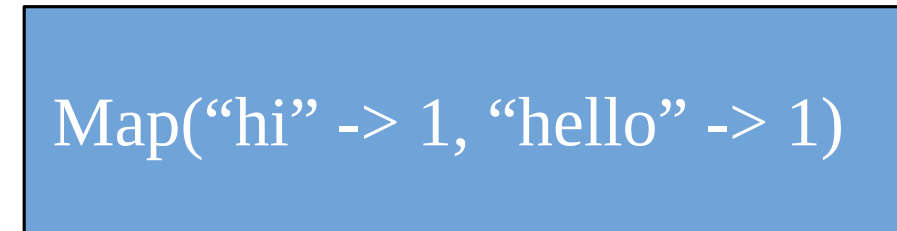
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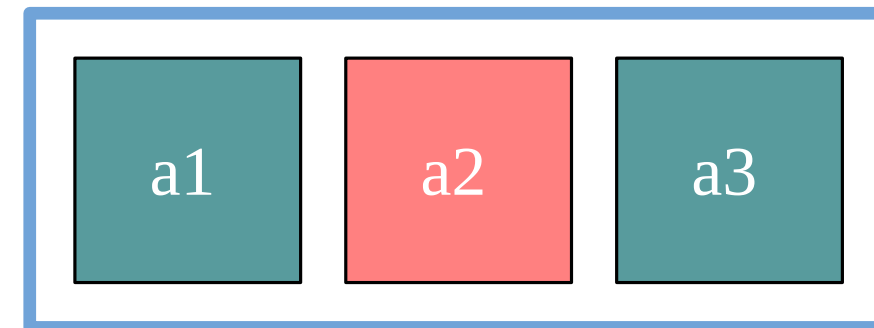
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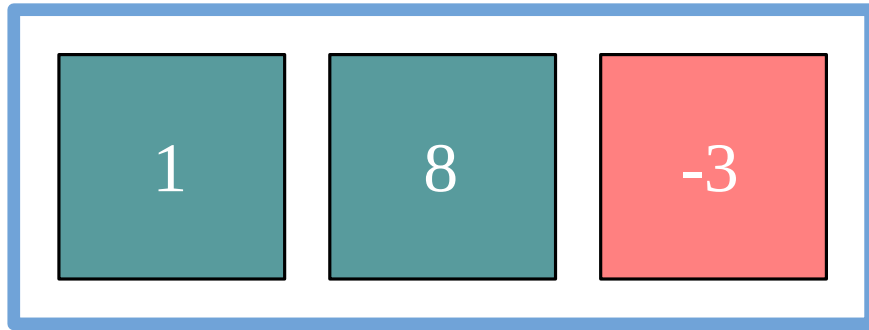
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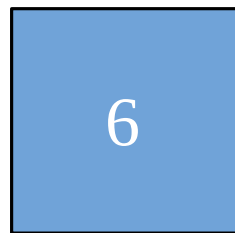
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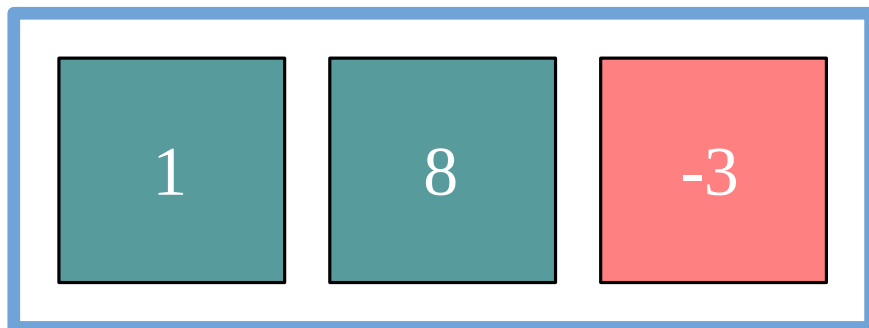
sum



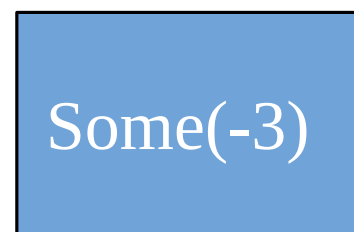
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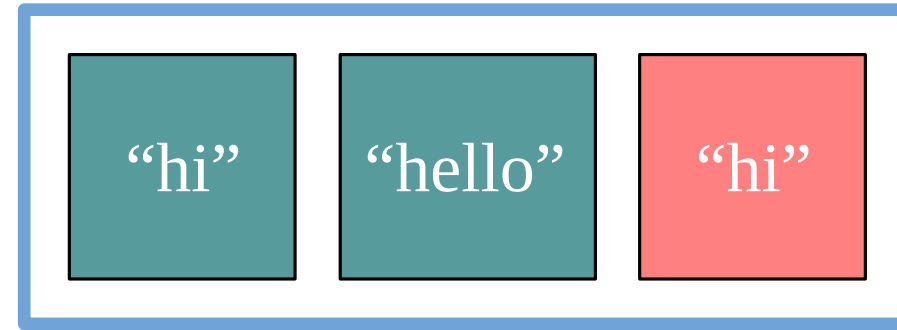
min



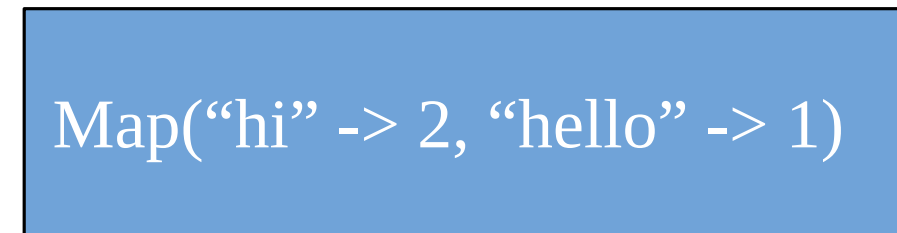
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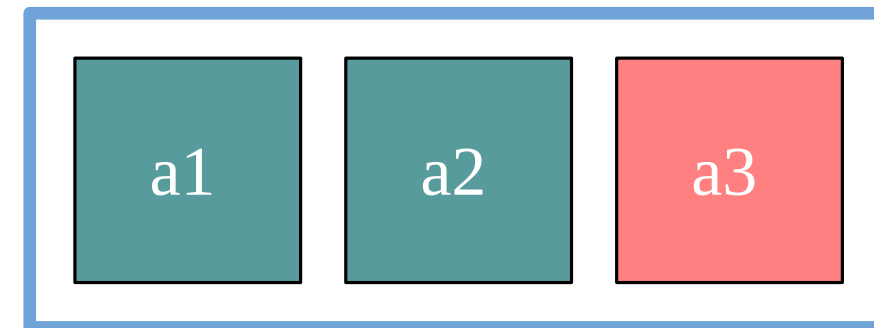
wordCount



state



pattern



state





**ForLoopExercises.scala**

# Summary

- For loop syntax
- Iterate over a List
- foldLeft