Lesson 3

Functions: Composing a New Behavior

moveForward()

moveForward()

moveForward()

turnLeft()

turnLeft()

turnLeft()

moveForward()

moveForward()

moveForward()

collectGem()

Lesson 3

Functions: Creating a New Function

```
func turnRight() {
    turnLeft()
    turnLeft()
    turnLeft()
}
moveForward()
turnLeft()
moveForward()
moveForward()
turnRight()
moveForward()
moveForward()
turnRight()
moveForward()
moveForward()
turnRight()
moveForward()
moveForward()
moveForward()
moveForward()
turnLeft()
moveForward()
toggleSwitch()
```

Lesson 3

Functions: Creating a New Function

```
func turnRight() {
    turnLeft()
    turnLeft()
    turnLeft()
}
moveForward()
turnLeft()
moveForward()
moveForward()
turnRight()
moveForward()
moveForward()
turnRight()
moveForward()
moveForward()
turnRight()
moveForward()
moveForward()
moveForward()
moveForward()
turnLeft()
moveForward()
toggleSwitch()
```

Lesson 3

Functions: Collect, Toggle, Repeat

```
func pickPlace() {
    moveForward()
    collectGem()
    moveForward()
    toggleSwitch()
    moveForward()
}

pickPlace()
turnLeft()
pickPlace()
moveForward()
turnLeft()
pickPlace()
turnLeft()
pickPlace()
```

Lesson 3

Functions: Collect, Toggle, Repeat

```
func pickPlace() {
    moveForward()
    collectGem()
    moveForward()
    toggleSwitch()
    moveForward()
}

pickPlace()
turnLeft()
pickPlace()
moveForward()
turnLeft()
pickPlace()
turnLeft()
pickPlace()
```

Lesson 3

Functions: Across the Board

```
func completeRow() {
    collectGem()
    moveForward()
    toggleSwitch()
    moveForward()
    collectGem()
    moveForward()
    toggleSwitch()
}
```

moveForward()
completeRow()
turnRight()
moveForward()
turnRight()
completeRow()
turnLeft()
moveForward()
turnLeft()
completeRow()
turnRight()
moveForward()
turnRight()
completeRow()

Lesson 3

Functions: Across the Board

```
func completeRow() {
    collectGem()
    moveForward()
    toggleSwitch()
    moveForward()
    collectGem()
    moveForward()
    toggleSwitch()
}
```

moveForward()
completeRow()
turnRight()
moveForward()
turnRight()
completeRow()
turnLeft()
moveForward()
turnLeft()
completeRow()
turnRight()
moveForward()
turnRight()
completeRow()

Lesson 3

Functions: Nesting Patterns

```
func turnAround() {
    turnLeft()
    turnLeft()
}

func solveStair() {
    moveForward()
    collectGem()
    turnAround()
    moveForward()
    turnLeft()
}

solveStair()
solveStair()
solveStair()
solveStair()
```

Lesson 3

Functions: Nesting Patterns

```
func turnAround() {
    turnLeft()
    turnLeft()
}

func solveStair() {
    moveForward()
    collectGem()
    turnAround()
    moveForward()
    turnLeft()
}

solveStair()
solveStair()
solveStair()
solveStair()
```

Lesson 3

Functions: Slotted Stairways

```
func collectGemTurnAround() {
    moveForward()
    moveForward()
    collectGem()
    turnLeft()
    turnLeft()
    moveForward()
    moveForward()
}
func solveRow() {
    collectGemTurnAround()
    collectGemTurnAround()
}
```

```
solveRow()
turnRight()
moveForward()
turnLeft()
solveRow()
turnRight()
moveForward()
turnLeft()
solveRow()
```

Lesson 3

Functions: Slotted Stairways

```
func collectGemTurnAround() {
    moveForward()
    moveForward()
    collectGem()
    turnLeft()
    turnLeft()
    moveForward()
    moveForward()
}
func solveRow() {
    collectGemTurnAround()
    collectGemTurnAround()
}
```

```
solveRow()
turnRight()
moveForward()
turnLeft()
solveRow()
turnRight()
moveForward()
turnLeft()
solveRow()
```

Lesson 3

Functions: Treasure Hunt

```
func moveThenToggle() {
    moveForward()
    moveForward()
    toggleSwitch()
}

func toggleThenReturn() {
    moveThenToggle()
    turnLeft()
    turnLeft()
    moveForward()
    moveFoward()
}

toggleThenReturn()
toggleThenReturn()
turnRight()
moveThenToggle()
toggleThenReturn()
moveForward()
moveForward()
moveThenToggle()
moveThenToggle()```"
```

Lesson 3

Functions: Treasure Hunt

```
func moveThenToggle() {
    moveForward()
    moveForward()
    toggleSwitch()
}

func toggleThenReturn() {
    moveThenToggle()
    turnLeft()
    turnLeft()
    moveForward()
    moveFoward()
}
```

```
toggleThenReturn()
toggleThenReturn()
turnRight()
moveThenToggle()
toggleThenReturn()
moveForward()
moveForward()
moveThenToggle()
moveThenToggle()```"
```

Lesson 3

For Loops: Using Loops

```
for i in 1...5 {
    moveForward()
    moveForward()
    collectGem()
    moveForward()
}
```

For Loops: Looping All the Sides

```
for i in 1...4 {
    moveForward()
    collectGem()
    moveForward()
    moveForward()
    moveForward()
    turnRight()
}
```

Lesson 3

For Loops: Using Loops

```
for i in 1...5 {
    moveForward()
    moveForward()
    collectGem()
    moveForward()
}
```

For Loops: Looping All the Sides

```
for i in 1...4 {
    moveForward()
    collectGem()
    moveForward()
    moveForward()
    moveForward()
    turnRight()
}
```

Lesson 3

For Loops: To the Edge and Back

```
for i in 1...4 {
    moveForward()
    moveForward()
    toggleSwitch()
    turnRight()
    turnRight()
    moveForward()
    moveForward()
    turnLeft()
}
```

For Loops: Loop Jumper

```
for i in 1...5 {
    moveForward()
    turnLeft()
    moveForward()
    moveForward()
    collectGem()
    turnRight()
}
```

*Some puzzles may have multiple solutions

Lesson 3

For Loops: To the Edge and Back

```
for i in 1...4 {
    moveForward()
    moveForward()
    toggleSwitch()
    turnRight()
    turnRight()
    moveForward()
    moveForward()
    turnLeft()
}
```

For Loops: Loop Jumper

```
for i in 1...5 {
    moveForward()
    turnLeft()
    moveForward()
    moveForward()
    collectGem()
    turnRight()
}
```

*Some puzzles may have multiple solutions