PROJEKTPRÄSENTATION SOFTWARE ENGINEERING

Gruppe 10: Florian Djokaj und Markus Käppeler

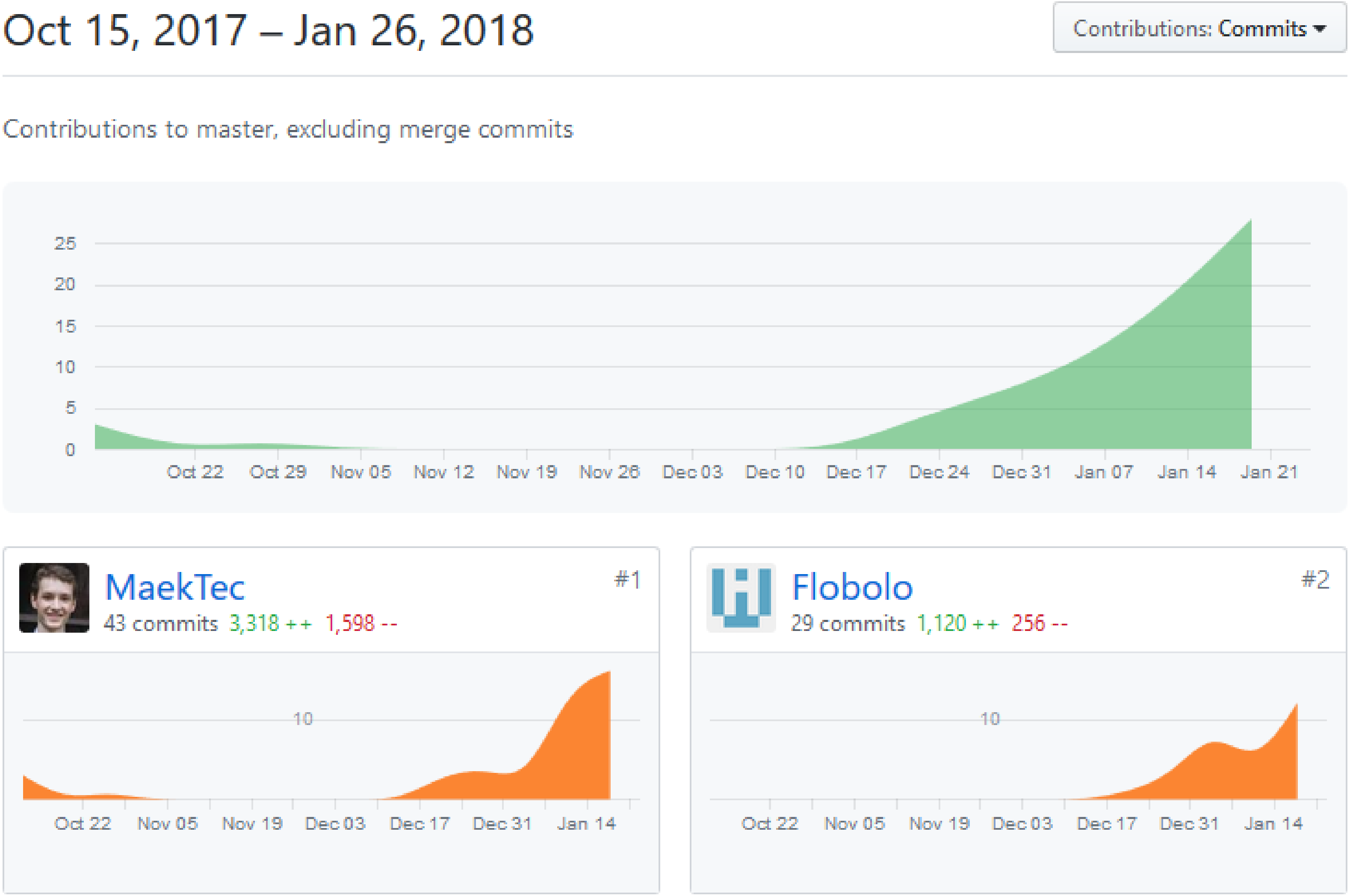
GLIEDERUNG

1. Go Regeln
2. Version Control System
3. Scrum
4. Layers an MVC
5. Code Coverage
6. CI
7. Design Patterns
8. Components and Interfaces
9. Dependency Injection
10. FILE IO in JSON and XML
11. Documentation
12. TUI
13. GUI

GO RULES

- 2 Spieler, rundenbasiert, abwechselnd
- Schlagen durch Umzingeln
- Selbstmordverbot
- Passen und Spielende
- Tote Steine
- Abrechnung

VERSION CONTROL SYSTEM



Oct 15, 2017 – Jan 26, 2018

Contributions to master, excluding merge commits

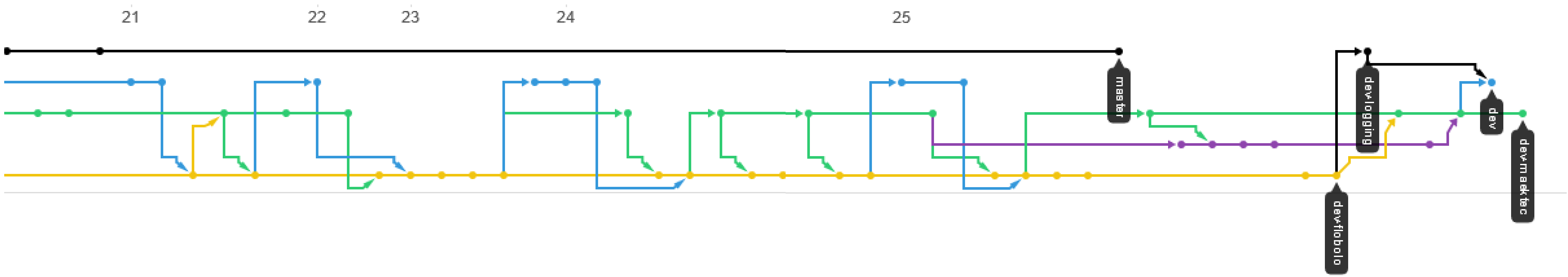
MaekTec #1

43 commits 3,318 ++ 1,598 --

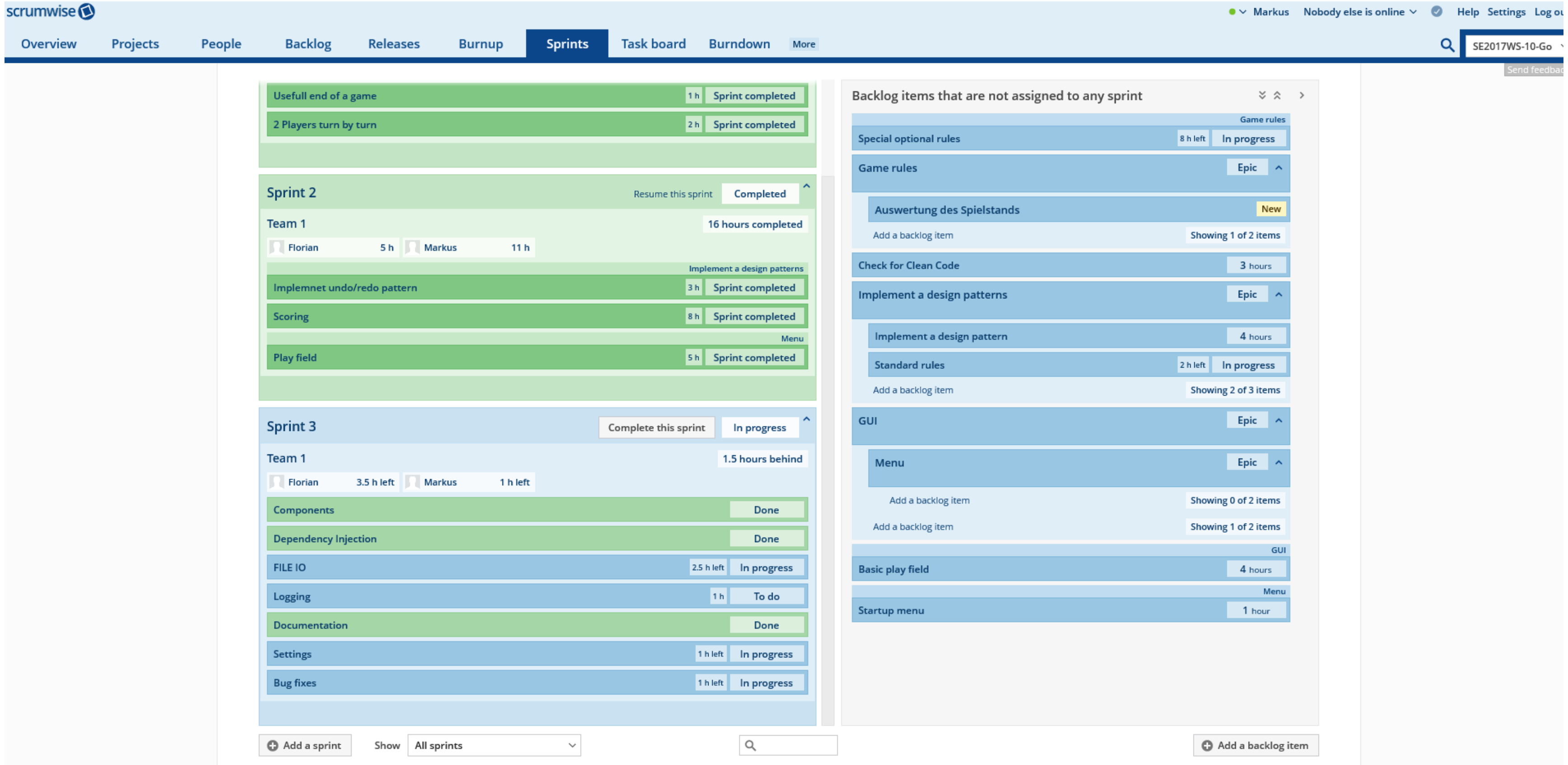
Flobolo #2

29 commits 1,120 ++ 256 --

VERSION CONTROL SYSTEM



SCRUM



Usefull end of a game 1 h Sprint completed

2 Players turn by turn 2 h Sprint completed

Sprint 2 Resume this sprint Completed

Team 1 16 hours completed

Florian 5 h Markus 11 h

Implement a design patterns

Implemnet undo/redo pattern 3 h Sprint completed

Scoring 8 h Sprint completed

Menu

Play field 5 h Sprint completed

Sprint 3 Complete this sprint In progress

Team 1 1.5 hours behind

Florian 3.5 h left Markus 1 h left

Components Done

Dependency Injection Done

FILE IO 2.5 h left In progress

Logging 1 h To do

Documentation Done

Settings 1 h left In progress

Bug fixes 1 h left In progress

Add a sprint Show All sprints

Backlog items that are not assigned to any sprint

Game rules

Special optional rules 8 h left In progress

Game rules Epic

Auswertung des Spielstands New

Add a backlog item Showing 1 of 2 items

Check for Clean Code 3 hours

Implement a design patterns Epic

Implement a design pattern 4 hours

Standard rules 2 h left In progress

Add a backlog item Showing 2 of 3 items

GUI Epic

Menu Epic

Add a backlog item Showing 0 of 2 items

Add a backlog item Showing 1 of 2 items

GUI

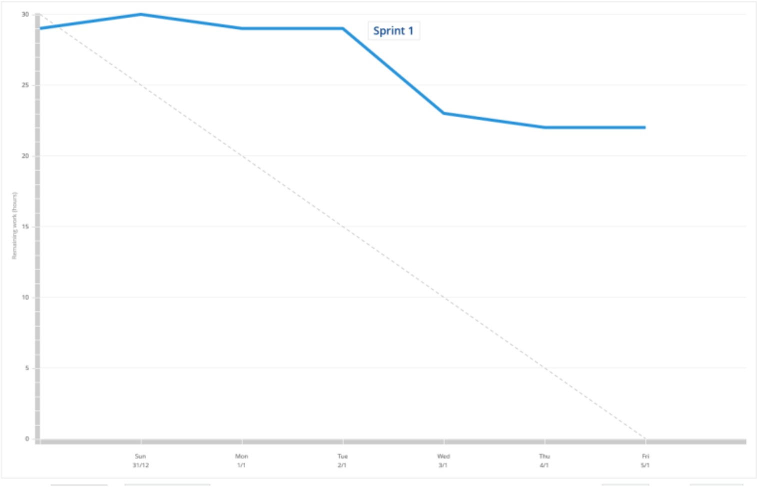
Basic play field 4 hours

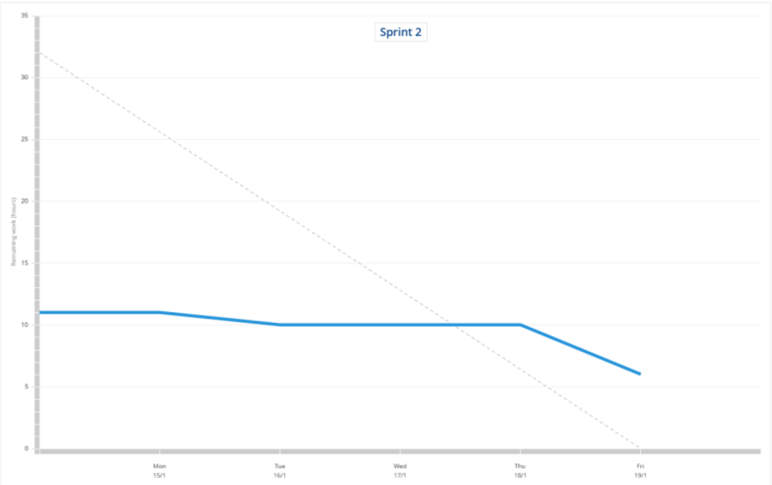
Menu

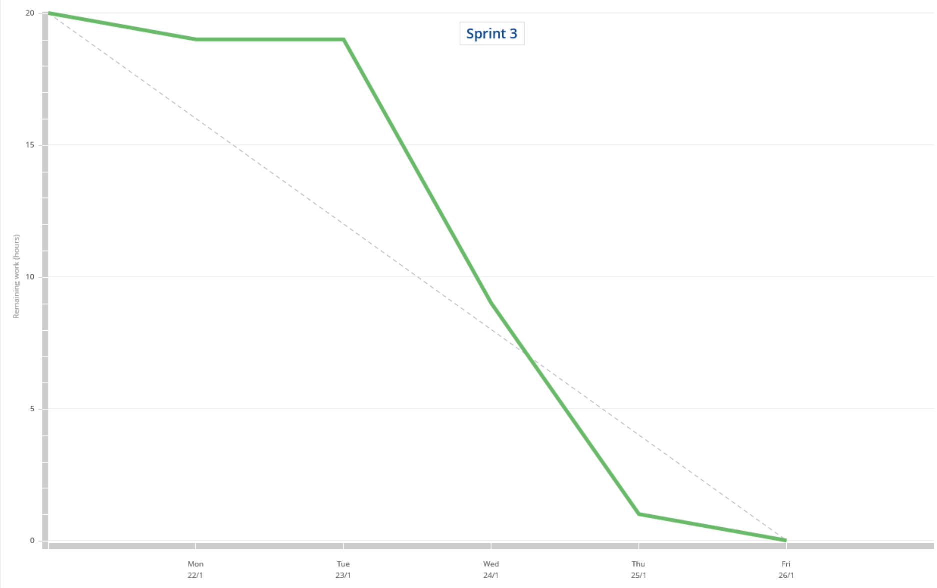
Startup menu 1 hour

Add a backlog item

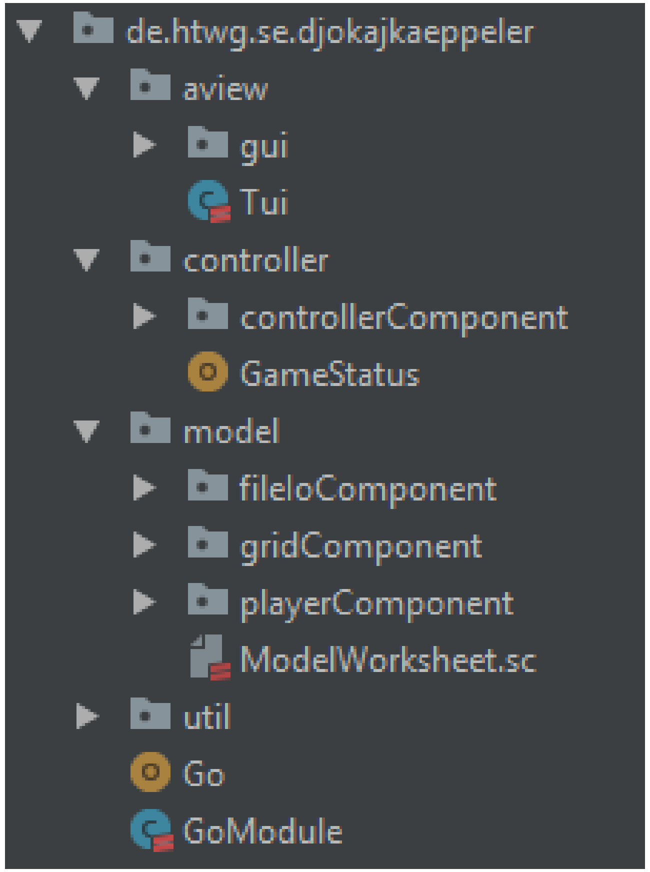
BURNDOWNCHARTS





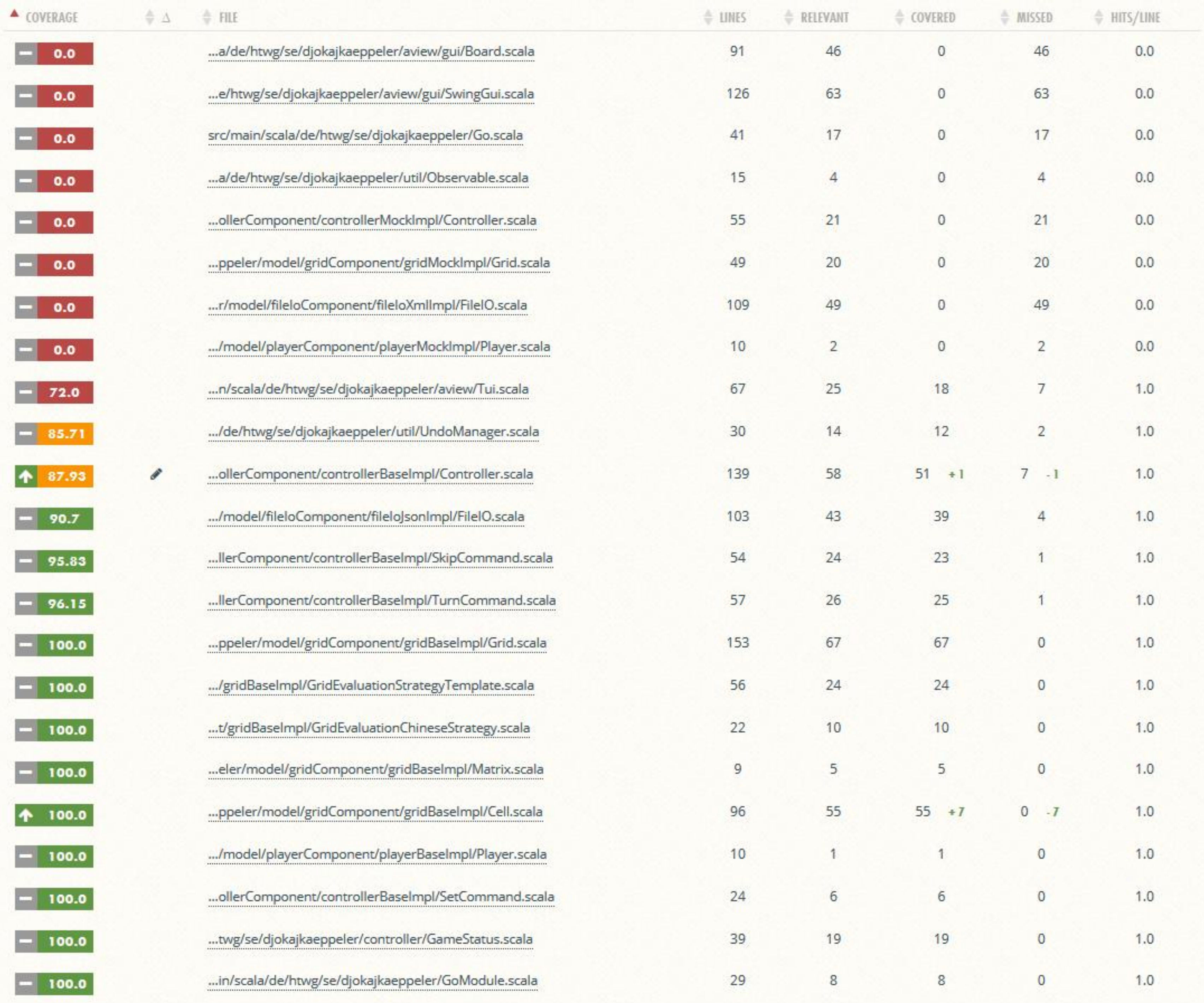


LAYERS AND MVC



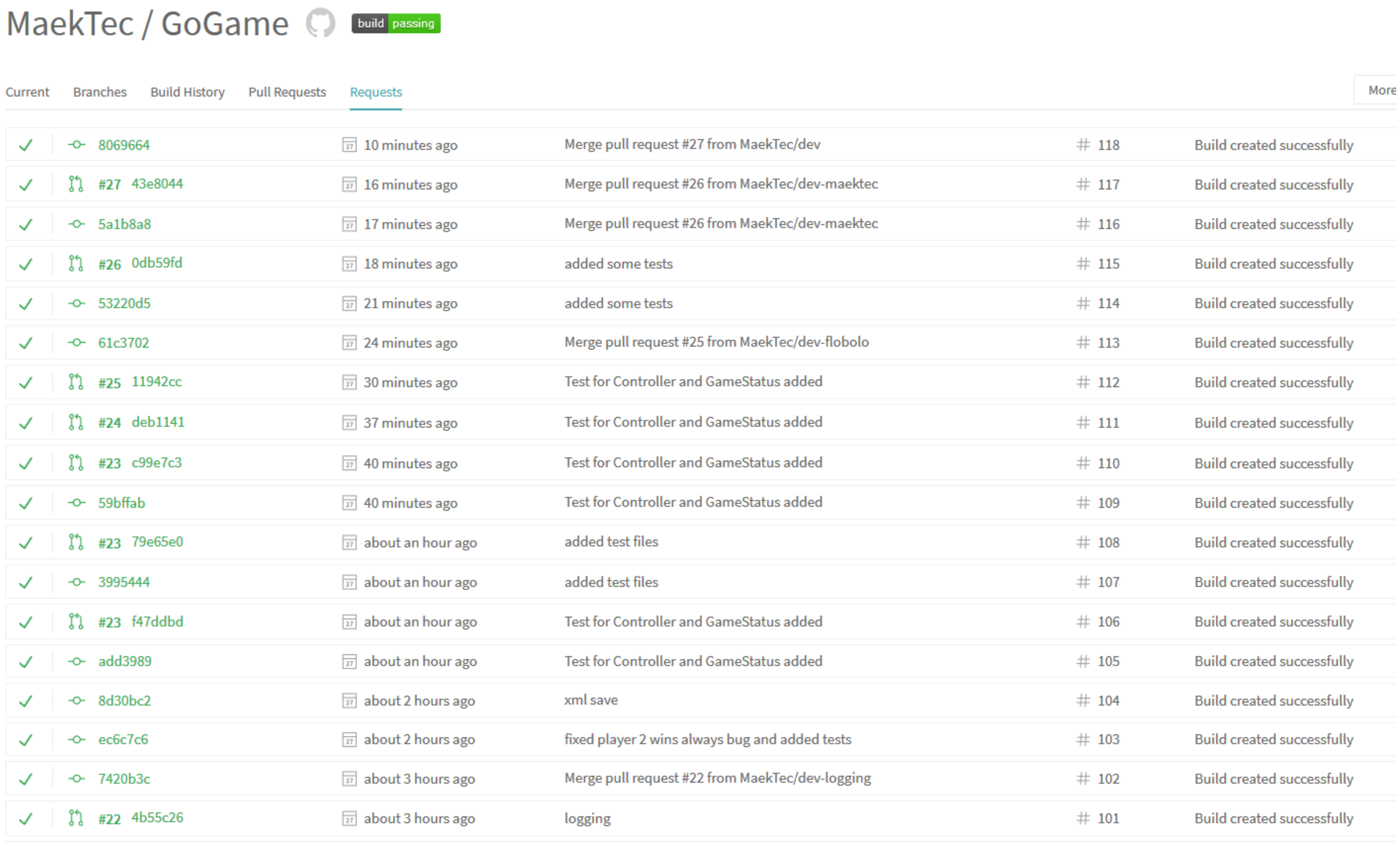
```
▼ de.htwg.se.djokajkaeppeler
    ▼ aview
        ▶ gui
          Tui
    ▼ controller
        ▶ controllerComponent
          GameStatus
    ▼ model
        ▶ fileIoComponent
        ▶ gridComponent
        ▶ playerComponent
          ModelWorksheet.sc
    ▶ util
      Go
      GoModule
```

CODE COVERAGE



▲ COVERAGE	Δ	FILE	LINES	RELEVANT	COVERED	MISSED	HITS/LINE
− 0.0		...a/de/htwg/se/djokajkaeppeler/aview/gui/Board.scala	91	46	0	46	0.0
− 0.0		...e/htwg/se/djokajkaeppeler/aview/gui/SwingGui.scala	126	63	0	63	0.0
− 0.0		src/main/scala/de/htwg/se/djokajkaeppeler/Go.scala	41	17	0	17	0.0
− 0.0		...a/de/htwg/se/djokajkaeppeler/util/Observable.scala	15	4	0	4	0.0
− 0.0		...ollerComponent/controllerMockImpl/Controller.scala	55	21	0	21	0.0
− 0.0		...ppeler/model/gridComponent/gridMockImpl/Grid.scala	49	20	0	20	0.0
− 0.0		...r/model/fileIoComponent/fileIoXmlImpl/FileIO.scala	109	49	0	49	0.0
− 0.0		.../model/playerComponent/playerMockImpl/Player.scala	10	2	0	2	0.0
− 72.0		...n/scala/de/htwg/se/djokajkaeppeler/aview/Tui.scala	67	25	18	7	1.0
− 85.71		.../de/htwg/se/djokajkaeppeler/util/UndoManager.scala	30	14	12	2	1.0
↑ 87.93	✎	...ollerComponent/controllerBaseImpl/Controller.scala	139	58	51 +1	7 -1	1.0
− 90.7		.../model/fileIoComponent/fileIoJsonImpl/FileIO.scala	103	43	39	4	1.0
− 95.83		...llerComponent/controllerBaseImpl/SkipCommand.scala	54	24	23	1	1.0
− 96.15		...llerComponent/controllerBaseImpl/TurnCommand.scala	57	26	25	1	1.0
− 100.0		...ppeler/model/gridComponent/gridBaseImpl/Grid.scala	153	67	67	0	1.0
− 100.0		.../gridBaseImpl/GridEvaluationStrategyTemplate.scala	56	24	24	0	1.0
− 100.0		...t/gridBaseImpl/GridEvaluationChineseStrategy.scala	22	10	10	0	1.0
− 100.0		...eler/model/gridComponent/gridBaseImpl/Matrix.scala	9	5	5	0	1.0
↑ 100.0		...ppeler/model/gridComponent/gridBaseImpl/Cell.scala	96	55	55 +7	0 -7	1.0
− 100.0		.../model/playerComponent/playerBaseImpl/Player.scala	10	1	1	0	1.0
− 100.0		...ollerComponent/controllerBaseImpl/SetCommand.scala	24	6	6	0	1.0
− 100.0		...twg/se/djokajkaeppeler/controller/GameStatus.scala	39	19	19	0	1.0
− 100.0		...in/scala/de/htwg/se/djokajkaeppeler/GoModule.scala	29	8	8	0	1.0

CONTINIOUS INTIGREATION



MaekTec / GoGame build passing

✓	8069664	10 minutes ago	Merge pull request #27 from MaekTec/dev	# 118	Build created successfully
✓	#27 43e8044	16 minutes ago	Merge pull request #26 from MaekTec/dev-maektec	# 117	Build created successfully
✓	5a1b8a8	17 minutes ago	Merge pull request #26 from MaekTec/dev-maektec	# 116	Build created successfully
✓	#26 0db59fd	18 minutes ago	added some tests	# 115	Build created successfully
✓	53220d5	21 minutes ago	added some tests	# 114	Build created successfully
✓	61c3702	24 minutes ago	Merge pull request #25 from MaekTec/dev-flobolo	# 113	Build created successfully
✓	#25 11942cc	30 minutes ago	Test for Controller and GameStatus added	# 112	Build created successfully
✓	#24 deb1141	37 minutes ago	Test for Controller and GameStatus added	# 111	Build created successfully
✓	#23 c99e7c3	40 minutes ago	Test for Controller and GameStatus added	# 110	Build created successfully
✓	59bffab	40 minutes ago	Test for Controller and GameStatus added	# 109	Build created successfully
✓	#23 79e65e0	about an hour ago	added test files	# 108	Build created successfully
✓	3995444	about an hour ago	added test files	# 107	Build created successfully
✓	#23 f47ddbd	about an hour ago	Test for Controller and GameStatus added	# 106	Build created successfully
✓	add3989	about an hour ago	Test for Controller and GameStatus added	# 105	Build created successfully
✓	8d30bc2	about 2 hours ago	xml save	# 104	Build created successfully
✓	ec6c7c6	about 2 hours ago	fixed player 2 wins always bug and added tests	# 103	Build created successfully
✓	7420b3c	about 3 hours ago	Merge pull request #22 from MaekTec/dev-logging	# 102	Build created successfully
✓	#22 4b55c26	about 3 hours ago	logging	# 101	Build created successfully

DESIGN PATTERNS

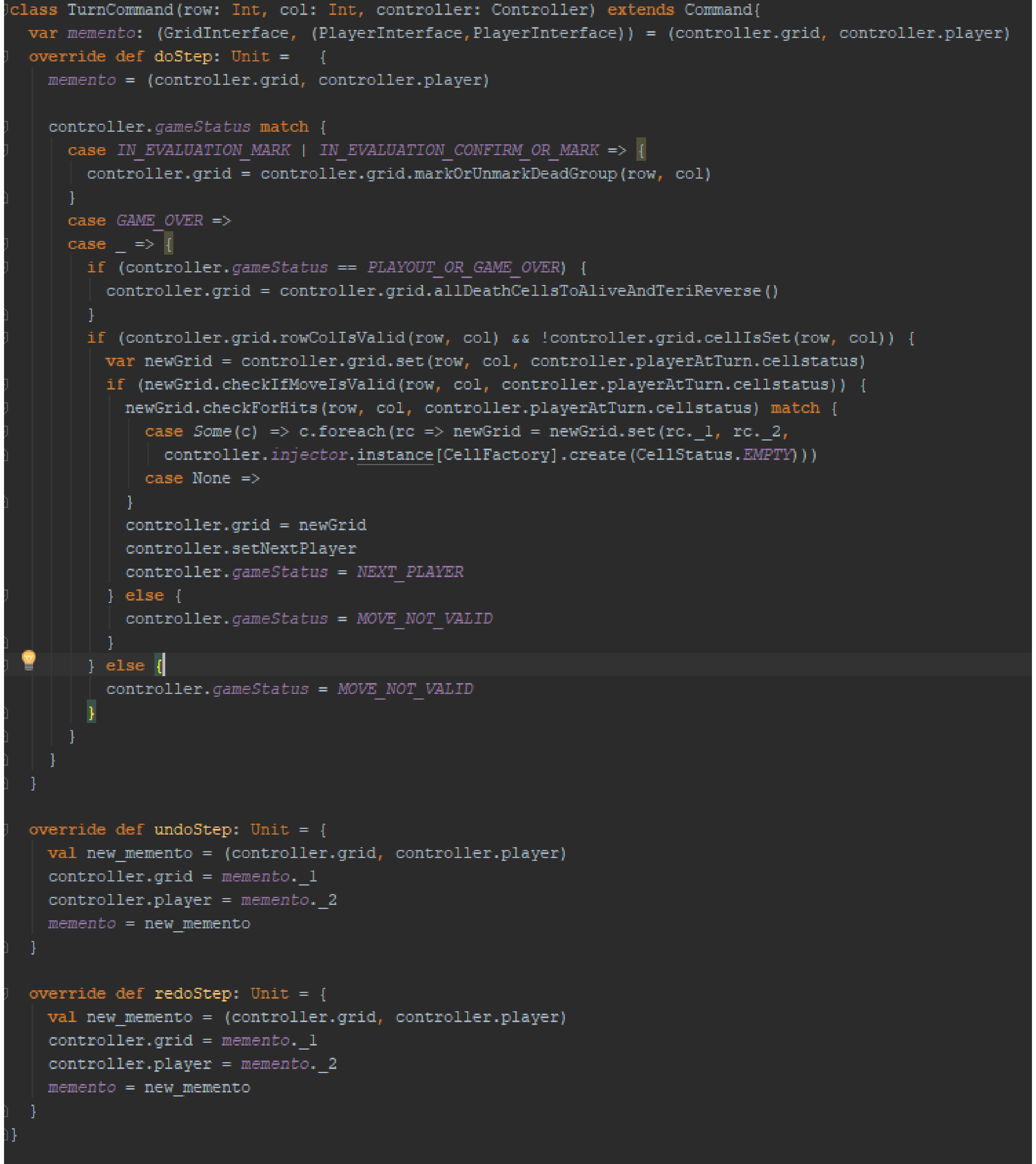
Observer Pattern (for MVC)

Command Pattern (do, undo and redo)

Strategy Pattern (for different rules)

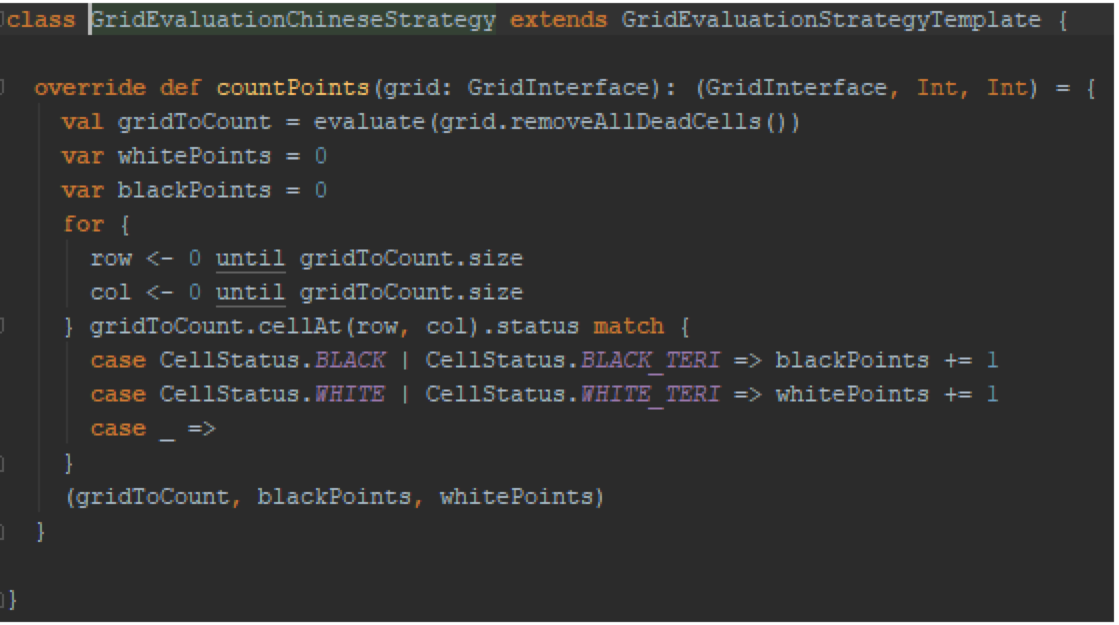
Factory Pattern (in Dependency Injection)

COMMAND PATTERN

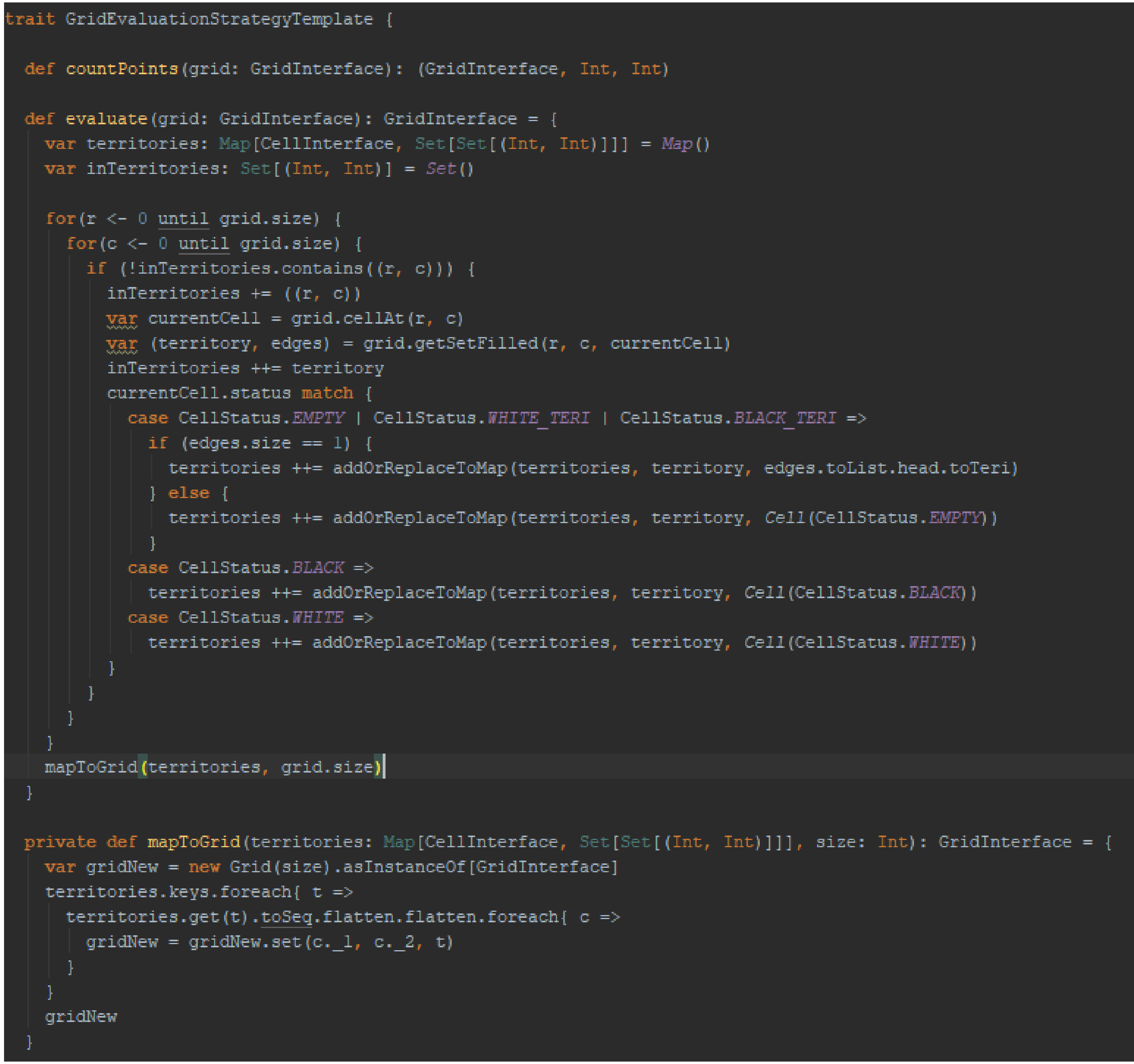


```
class TurnCommand(row: Int, col: Int, controller: Controller) extends Command{
  var memento: (GridInterface, (PlayerInterface,PlayerInterface)) = (controller.grid, controller.player)
  override def doStep: Unit =   {
    memento = (controller.grid, controller.player)

    controller.gameStatus match {
      case IN_EVALUATION_MARK | IN_EVALUATION_CONFIRM_OR_MARK => {
        controller.grid = controller.grid.markOrUnmarkDeadGroup(row, col)
      }
      case GAME_OVER =>
      case _ => {
        if (controller.gameStatus == PLAYOUT_OR_GAME_OVER) {
          controller.grid = controller.grid.allDeathCellsToAliveAndTeriReverse()
        }
        if (controller.grid.rowColIsValid(row, col) && !controller.grid.cellIsSet(row, col)) {
          var newGrid = controller.grid.set(row, col, controller.playerAtTurn.cellstatus)
          if (newGrid.checkIfMoveIsValid(row, col, controller.playerAtTurn.cellstatus)) {
            newGrid.checkForHits(row, col, controller.playerAtTurn.cellstatus) match {
              case Some(c) => c.foreach(rc => newGrid = newGrid.set(rc._1, rc._2,
                controller.injector.instance[CellFactory].create(CellStatus.EMPTY)))
              case None =>
            }
            controller.grid = newGrid
            controller.setNextPlayer
            controller.gameStatus = NEXT_PLAYER
          } else {
            controller.gameStatus = MOVE_NOT_VALID
          }
        } else {
          controller.gameStatus = MOVE_NOT_VALID
        }
      }
    }
  }

  override def undoStep: Unit = {
    val new_memento = (controller.grid, controller.player)
    controller.grid = memento._1
    controller.player = memento._2
    memento = new_memento
  }

  override def redoStep: Unit = {
    val new_memento = (controller.grid, controller.player)
    controller.grid = memento._1
    controller.player = memento._2
    memento = new_memento
  }
}
```

STRATEGY PATTERN

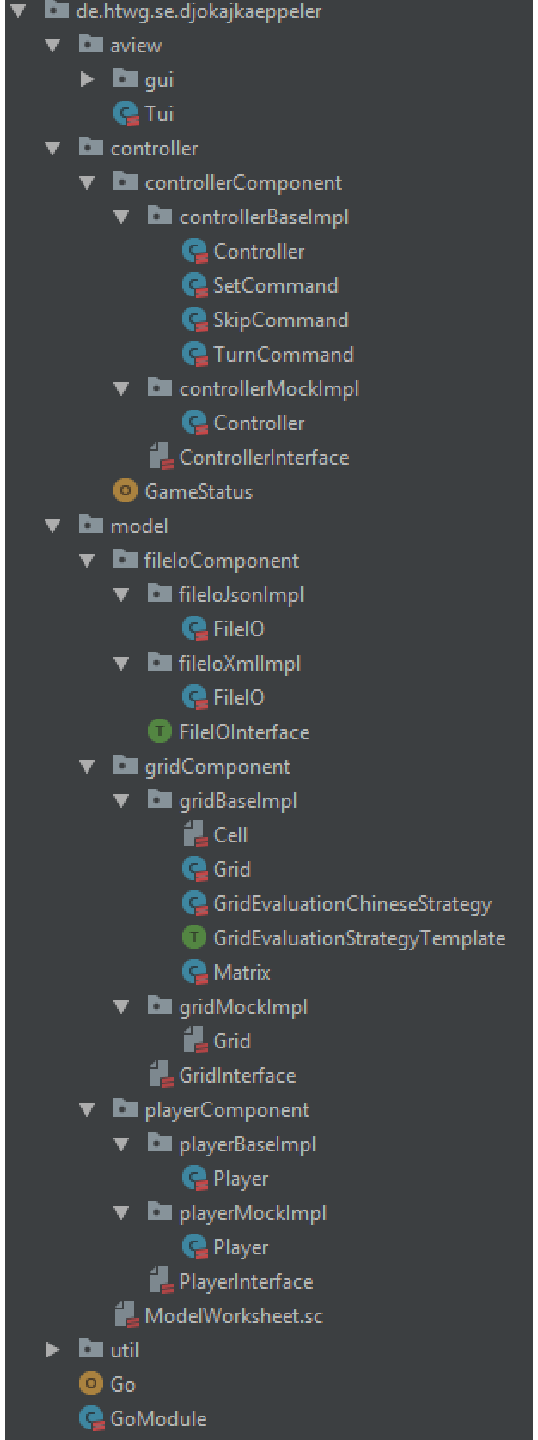


```
class GridEvaluationChineseStrategy extends GridEvaluationStrategyTemplate {

  override def countPoints(grid: GridInterface): (GridInterface, Int, Int) = {
    val gridToCount = evaluate(grid.removeAllDeadCells())
    var whitePoints = 0
    var blackPoints = 0
    for {
      row <- 0 until gridToCount.size
      col <- 0 until gridToCount.size
    } gridToCount.cellAt(row, col).status match {
      case CellStatus.BLACK | CellStatus.BLACK_TERI => blackPoints += 1
      case CellStatus.WHITE | CellStatus.WHITE_TERI => whitePoints += 1
      case _ =>
    }
    (gridToCount, blackPoints, whitePoints)
  }

}
```



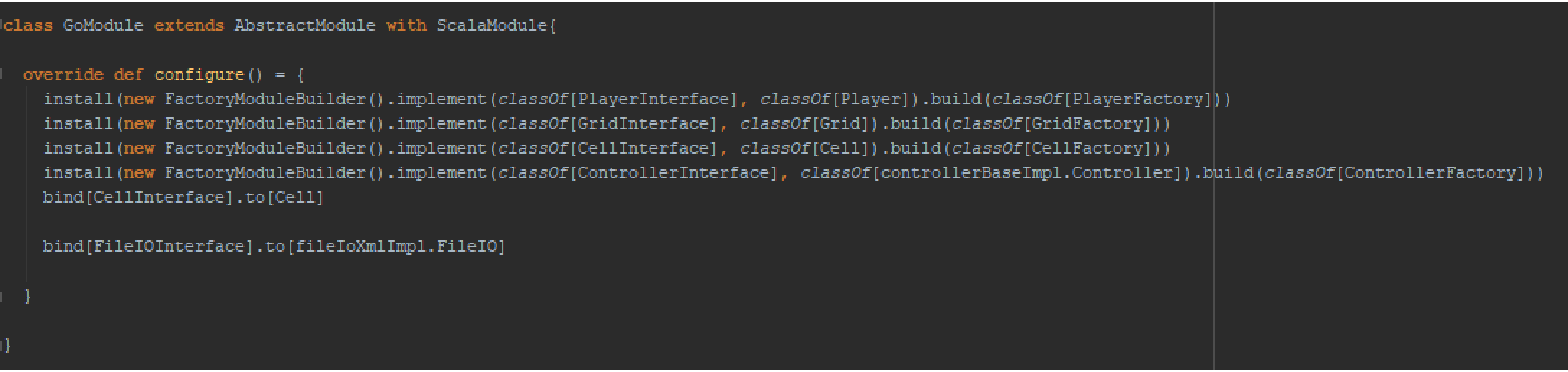
```
trait GridEvaluationStrategyTemplate {

  def countPoints(grid: GridInterface): (GridInterface, Int, Int)

  def evaluate(grid: GridInterface): GridInterface = {
    var territories: Map[CellInterface, Set[Set[(Int, Int)]]] = Map()
    var inTerritories: Set[(Int, Int)] = Set()

    for(r <- 0 until grid.size) {
      for(c <- 0 until grid.size) {
        if (!inTerritories.contains((r, c))) {
          inTerritories += ((r, c))
          var currentCell = grid.cellAt(r, c)
          var (territory, edges) = grid.getSetFilled(r, c, currentCell)
          inTerritories ++= territory
          currentCell.status match {
            case CellStatus.EMPTY | CellStatus.WHITE_TERI | CellStatus.BLACK_TERI =>
              if (edges.size == 1) {
                territories ++= addOrReplaceToMap(territories, territory, edges.toList.head.toTeri)
              } else {
                territories ++= addOrReplaceToMap(territories, territory, Cell(CellStatus.EMPTY))
              }
            case CellStatus.BLACK =>
              territories ++= addOrReplaceToMap(territories, territory, Cell(CellStatus.BLACK))
            case CellStatus.WHITE =>
              territories ++= addOrReplaceToMap(territories, territory, Cell(CellStatus.WHITE))
          }
        }
      }
    }
    mapToGrid(territories, grid.size)
  }

  private def mapToGrid(territories: Map[CellInterface, Set[Set[(Int, Int)]]], size: Int): GridInterface = {
    var gridNew = new Grid(size).asInstanceOf[GridInterface]
    territories.keys.foreach{ t =>
      territories.get(t).toSeq.flatten.flatten.foreach{ c =>
        gridNew = gridNew.set(c._1, c._2, t)
      }
    }
    gridNew
  }
```

COMPONENTS AND INTERFACES

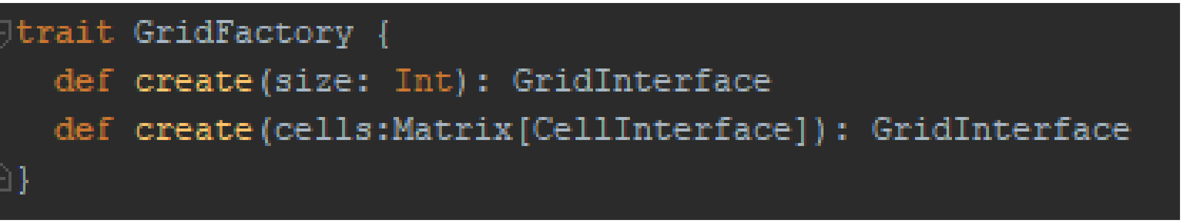


```
▼ de.htwg.se.djokajkaeppeler
  ▼ aview
    ▶ gui
      Tui
  ▼ controller
    ▼ controllerComponent
      ▼ controllerBaseImpl
          Controller
          SetCommand
          SkipCommand
          TurnCommand
      ▼ controllerMockImpl
          Controller
        ControllerInterface
      GameStatus
  ▼ model
    ▼ fileIoComponent
      ▼ fileIoJsonImpl
          FileIO
      ▼ fileIoXmlImpl
          FileIO
        FileIOInterface
    ▼ gridComponent
      ▼ gridBaseImpl
          Cell
          Grid
          GridEvaluationChineseStrategy
          GridEvaluationStrategyTemplate
          Matrix
      ▼ gridMockImpl
          Grid
        GridInterface
    ▼ playerComponent
      ▼ playerBaseImpl
          Player
      ▼ playerMockImpl
          Player
        PlayerInterface
      ModelWorksheet.sc
  ▶ util
    Go
    GoModule
```

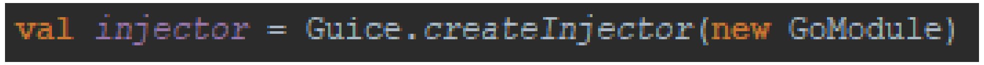
DEPENDENCY INJECTION



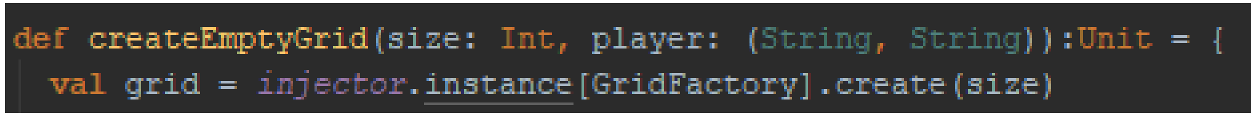
```scala
class GoModule extends AbstractModule with ScalaModule{

  override def configure() = {
    install(new FactoryModuleBuilder().implement(classOf[PlayerInterface], classOf[Player]).build(classOf[PlayerFactory]))
    install(new FactoryModuleBuilder().implement(classOf[GridInterface], classOf[Grid]).build(classOf[GridFactory]))
    install(new FactoryModuleBuilder().implement(classOf[CellInterface], classOf[Cell]).build(classOf[CellFactory]))
    install(new FactoryModuleBuilder().implement(classOf[ControllerInterface], classOf[controllerBaseImpl.Controller]).build(classOf[ControllerFactory]))
    bind[CellInterface].to[Cell]

    bind[FileIOInterface].to[fileIoXmlImpl.FileIO]

  }

}
```



```scala
trait GridFactory {
  def create(size: Int): GridInterface
  def create(cells:Matrix[CellInterface]): GridInterface
}
```

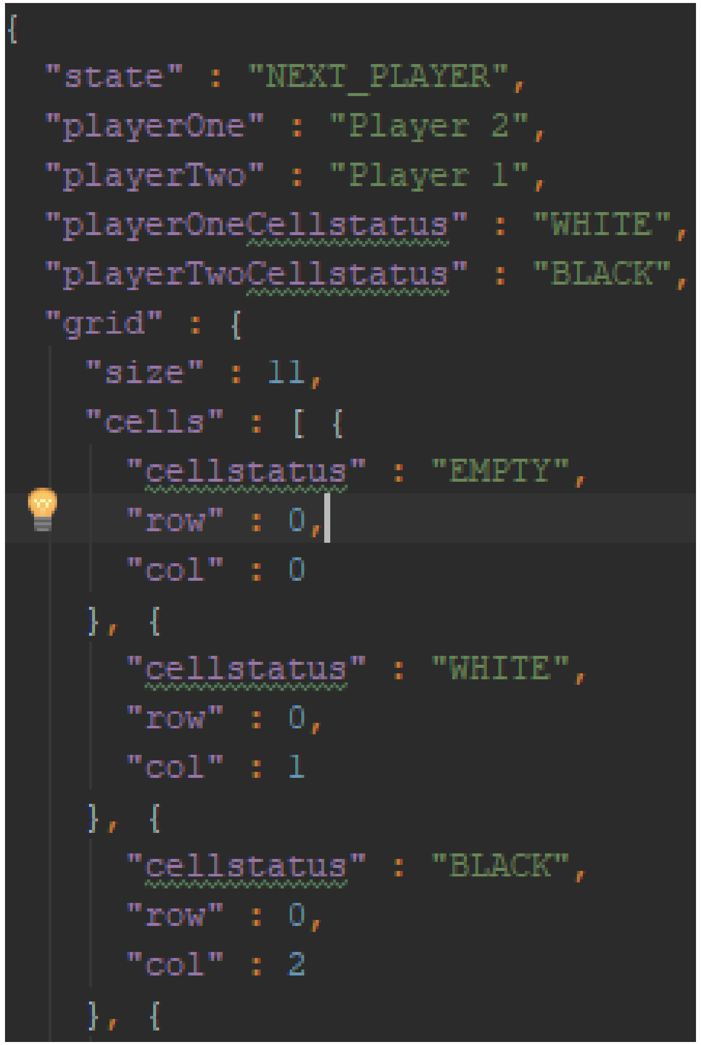


```scala
val injector = Guice.createInjector(new GoModule)
```

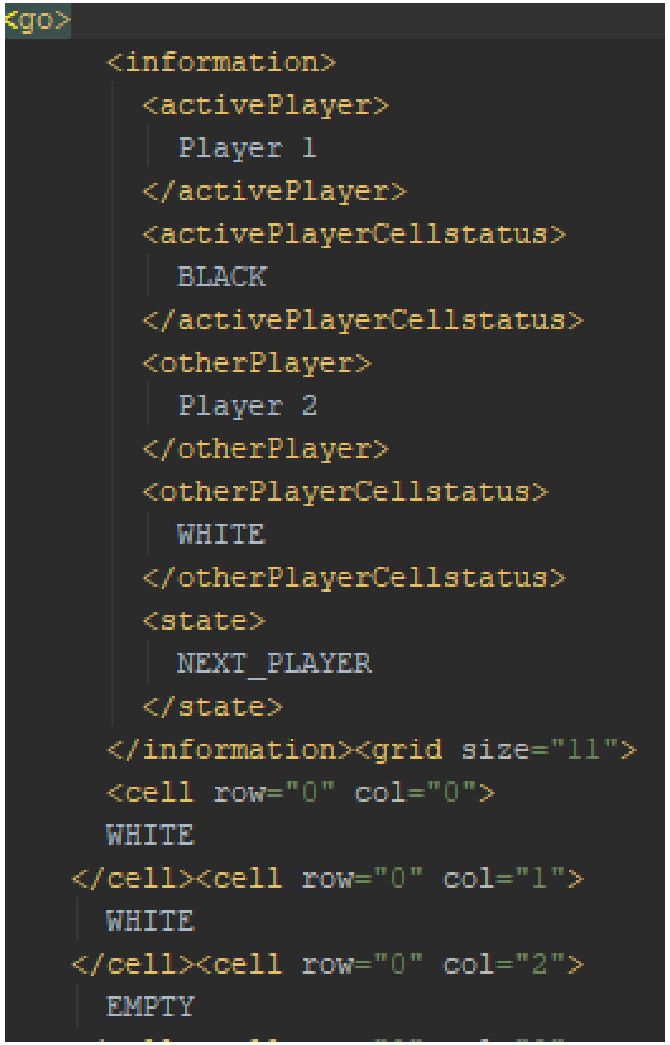


```scala
def createEmptyGrid(size: Int, player: (String, String)):Unit = {
  val grid = injector.instance[GridFactory].create(size)
```

FILE IO IN JSON AND XML

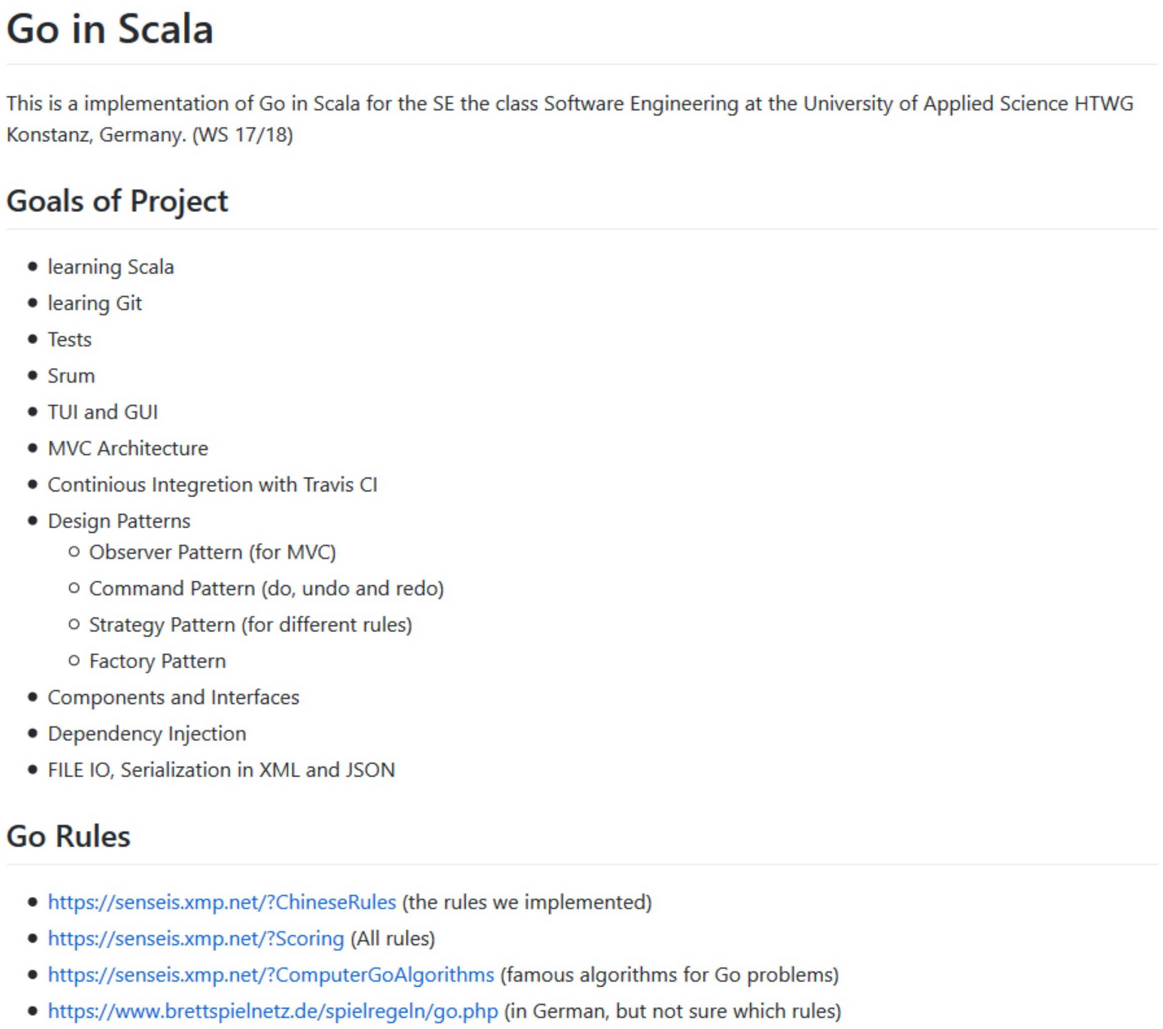


```json
{
  "state" : "NEXT_PLAYER",
  "playerOne" : "Player 2",
  "playerTwo" : "Player 1",
  "playerOneCellstatus" : "WHITE",
  "playerTwoCellstatus" : "BLACK",
  "grid" : {
    "size" : 11,
    "cells" : [ {
      "cellstatus" : "EMPTY",
      "row" : 0,
      "col" : 0
    }, {
      "cellstatus" : "WHITE",
      "row" : 0,
      "col" : 1
    }, {
      "cellstatus" : "BLACK",
      "row" : 0,
      "col" : 2
    }, {
```



```xml
<go>
      <information>
        <activePlayer>
          Player 1
        </activePlayer>
        <activePlayerCellstatus>
          BLACK
        </activePlayerCellstatus>
        <otherPlayer>
          Player 2
        </otherPlayer>
        <otherPlayerCellstatus>
          WHITE
        </otherPlayerCellstatus>
        <state>
          NEXT_PLAYER
        </state>
      </information><grid size="11">
      <cell row="0" col="0">
      WHITE
    </cell><cell row="0" col="1">
      WHITE
    </cell><cell row="0" col="2">
      EMPTY
```

DOCUMENTATION



Go in Scala

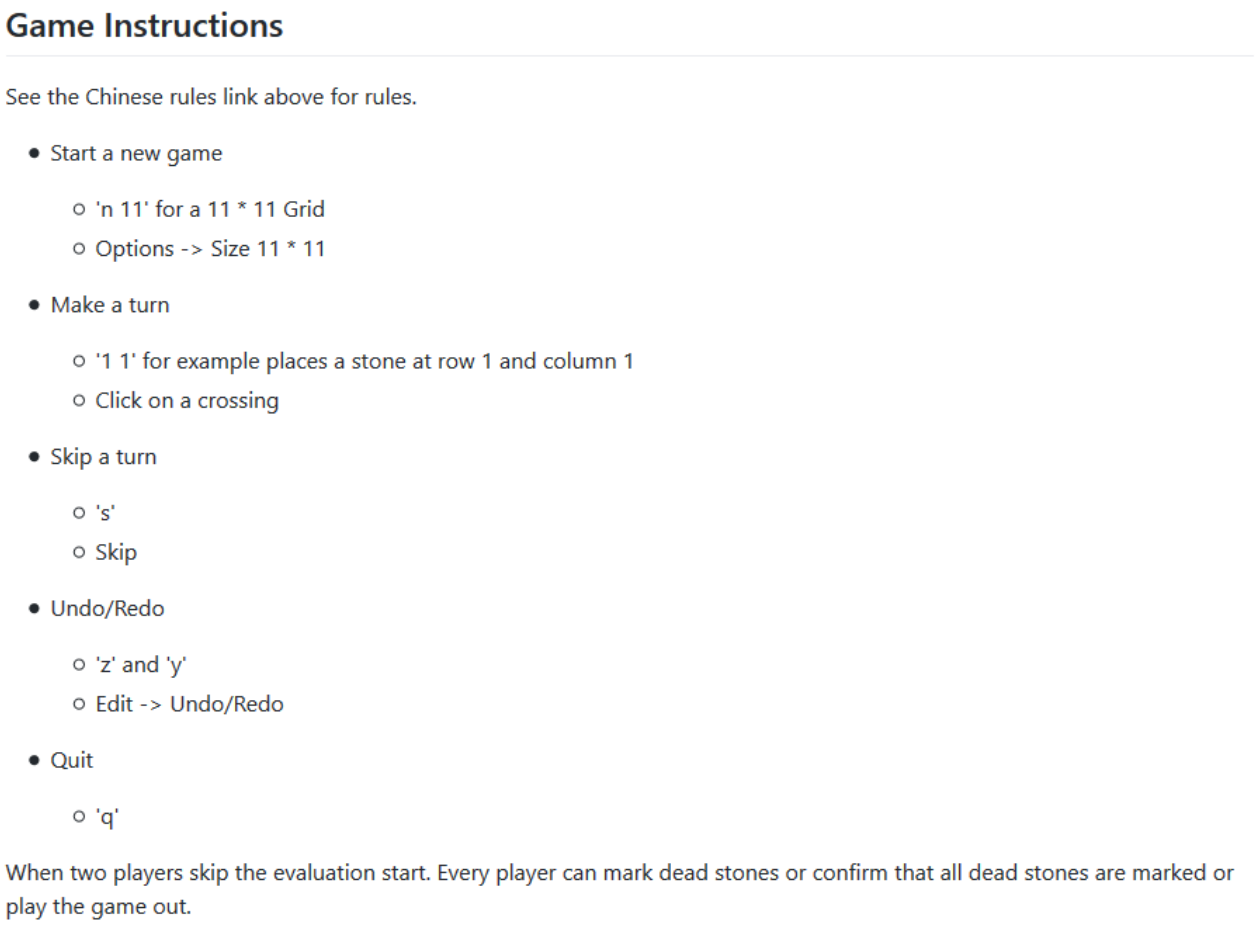
This is a implementation of Go in Scala for the SE the class Software Engineering at the University of Applied Science HTWG Konstanz, Germany. (WS 17/18)

Goals of Project

- learning Scala
- learing Git
- Tests
- Srum
- TUI and GUI
- MVC Architecture
- Continious Integretion with Travis CI
- Design Patterns
  - Observer Pattern (for MVC)
  - Command Pattern (do, undo and redo)
  - Strategy Pattern (for different rules)
  - Factory Pattern
- Components and Interfaces
- Dependency Injection
- FILE IO, Serialization in XML and JSON

Go Rules

- https://senseis.xmp.net/?ChineseRules (the rules we implemented)
- https://senseis.xmp.net/?Scoring (All rules)
- https://senseis.xmp.net/?ComputerGoAlgorithms (famous algorithms for Go problems)
- https://www.brettspielnetz.de/spielregeln/go.php (in German, but not sure which rules)



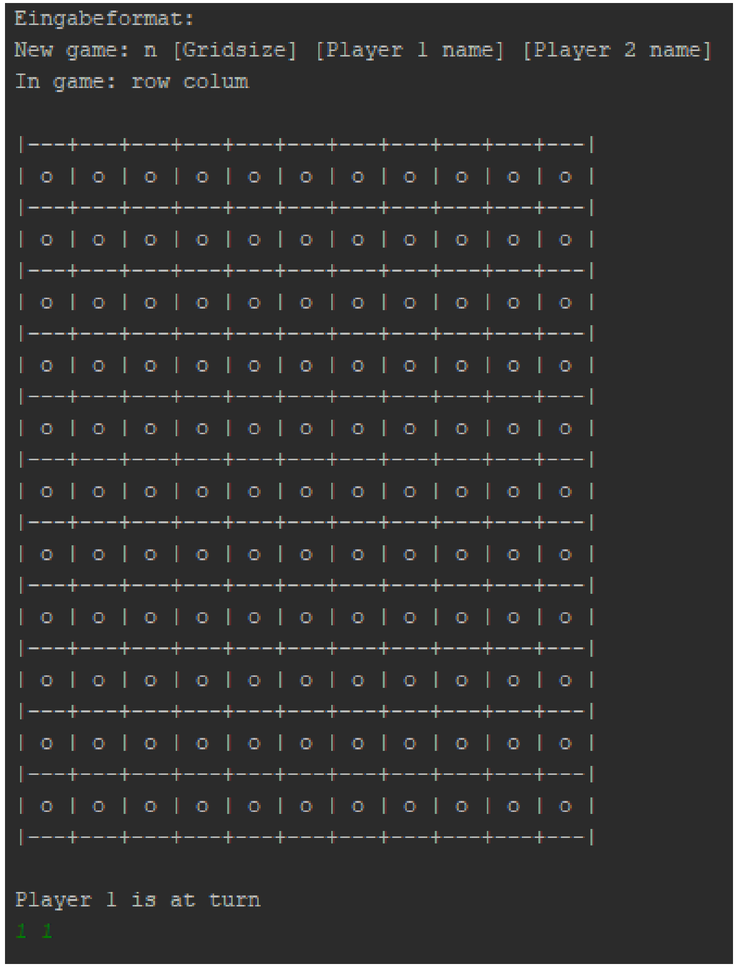
Game Instructions

See the Chinese rules link above for rules.

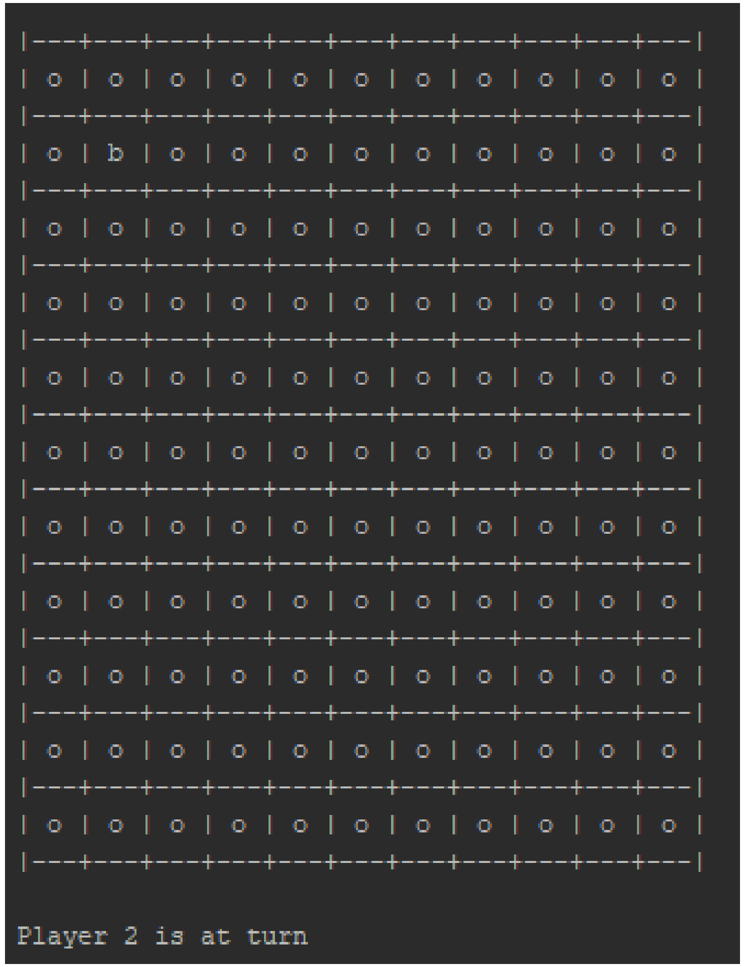
- Start a new game
  - 'n 11' for a 11 * 11 Grid
  - Options -> Size 11 * 11
- Make a turn
  - '1 1' for example places a stone at row 1 and column 1
  - Click on a crossing
- Skip a turn
  - 's'
  - Skip
- Undo/Redo
  - 'z' and 'y'
  - Edit -> Undo/Redo
- Quit
  - 'q'

When two players skip the evaluation start. Every player can mark dead stones or confirm that all dead stones are marked or play the game out.

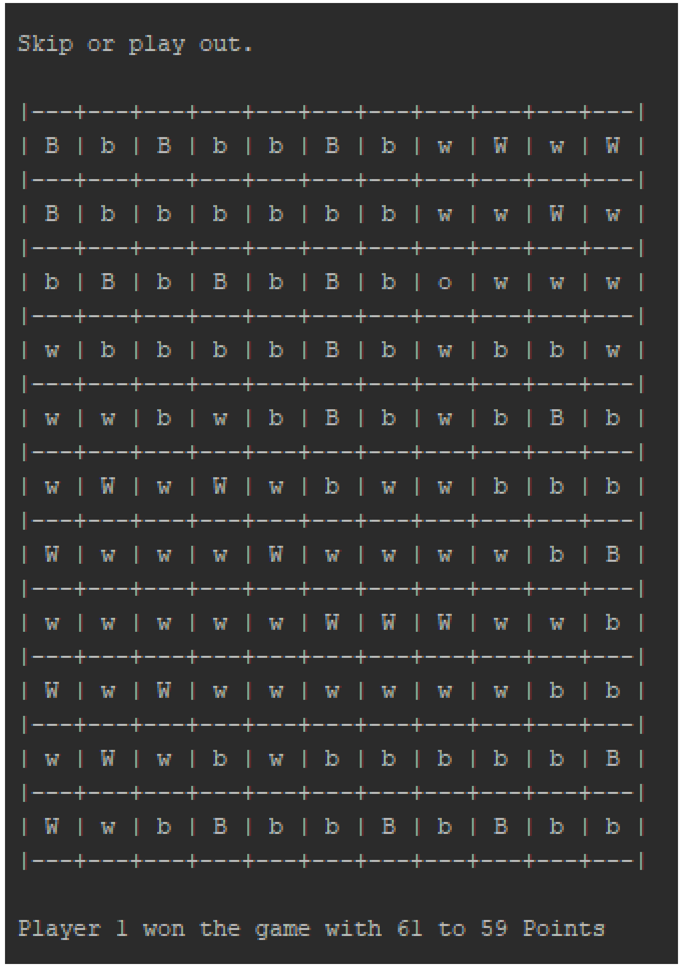
TUI DEVELOPMENT



```
Eingabeformat:
New game: n [Gridsize] [Player 1 name] [Player 2 name]
In game: row colum

|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|

Player 1 is at turn
1 1
```

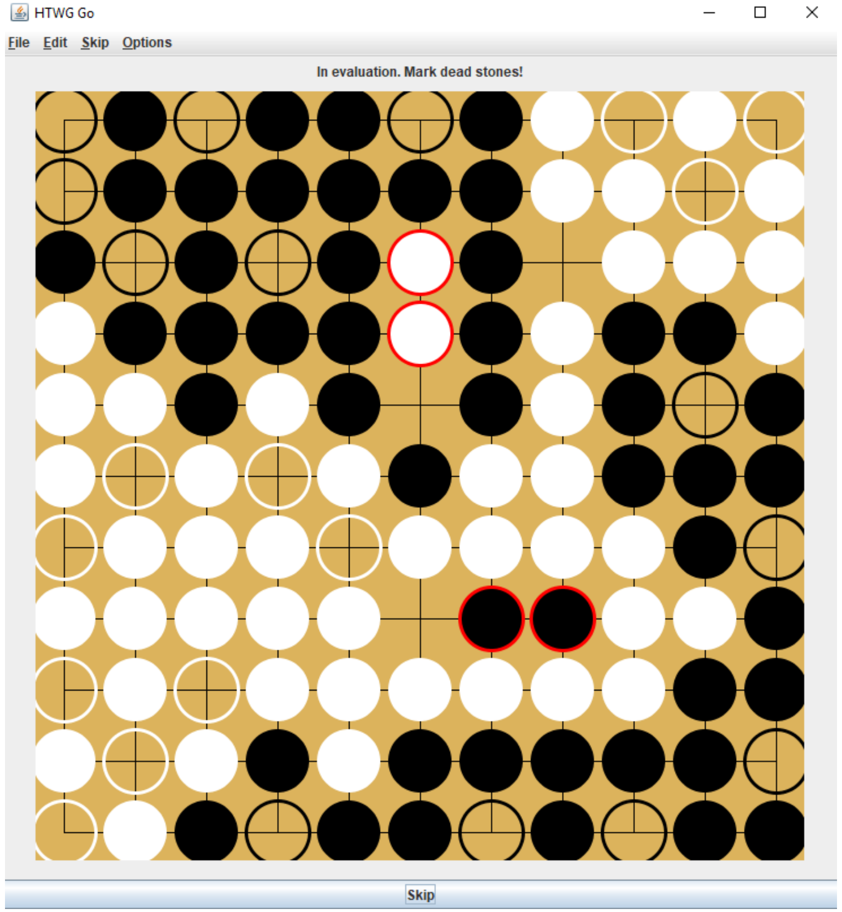


```
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | b | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|
| o | o | o | o | o | o | o | o | o | o | o |
|---+---+---+---+---+---+---+---+---+---+---|

Player 2 is at turn
```

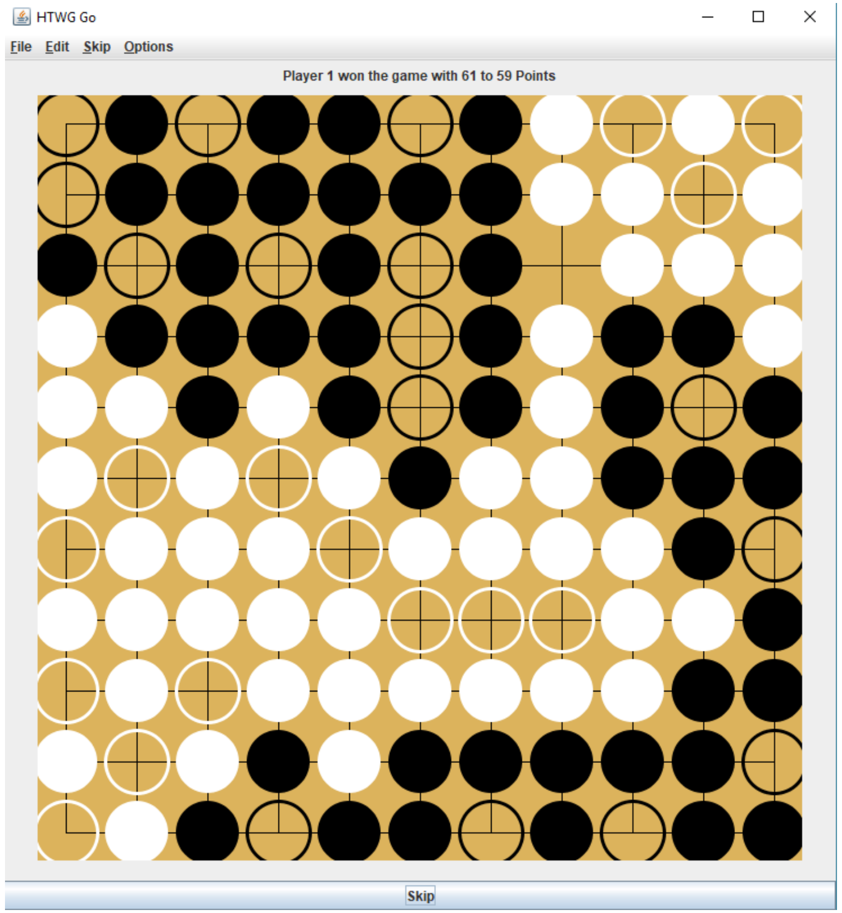


```
Skip or play out.

|---+---+---+---+---+---+---+---+---+---+---|
| B | b | B | b | b | B | b | w | W | w | W |
|---+---+---+---+---+---+---+---+---+---+---|
| B | b | b | b | b | b | b | w | w | W | w |
|---+---+---+---+---+---+---+---+---+---+---|
| b | B | b | B | b | B | b | o | w | w | w |
|---+---+---+---+---+---+---+---+---+---+---|
| w | b | b | b | b | B | b | w | b | b | w |
|---+---+---+---+---+---+---+---+---+---+---|
| w | w | b | w | b | B | b | w | b | B | b |
|---+---+---+---+---+---+---+---+---+---+---|
| w | W | w | W | w | b | w | w | b | b | b |
|---+---+---+---+---+---+---+---+---+---+---|
| W | w | w | w | W | w | w | w | w | b | B |
|---+---+---+---+---+---+---+---+---+---+---|
| w | w | w | w | w | W | W | W | w | w | b |
|---+---+---+---+---+---+---+---+---+---+---|
| W | w | W | w | w | w | w | w | w | b | b |
|---+---+---+---+---+---+---+---+---+---+---|
| w | W | w | b | w | b | b | b | b | b | B |
|---+---+---+---+---+---+---+---+---+---+---|
| W | w | b | B | b | b | B | b | B | b | b |
|---+---+---+---+---+---+---+---+---+---+---|

Player 1 won the game with 61 to 59 Points
```

GUI DEVELOPMENT



In evaluation. Mark dead stones!



Player 1 won the game with 61 to 59 Points