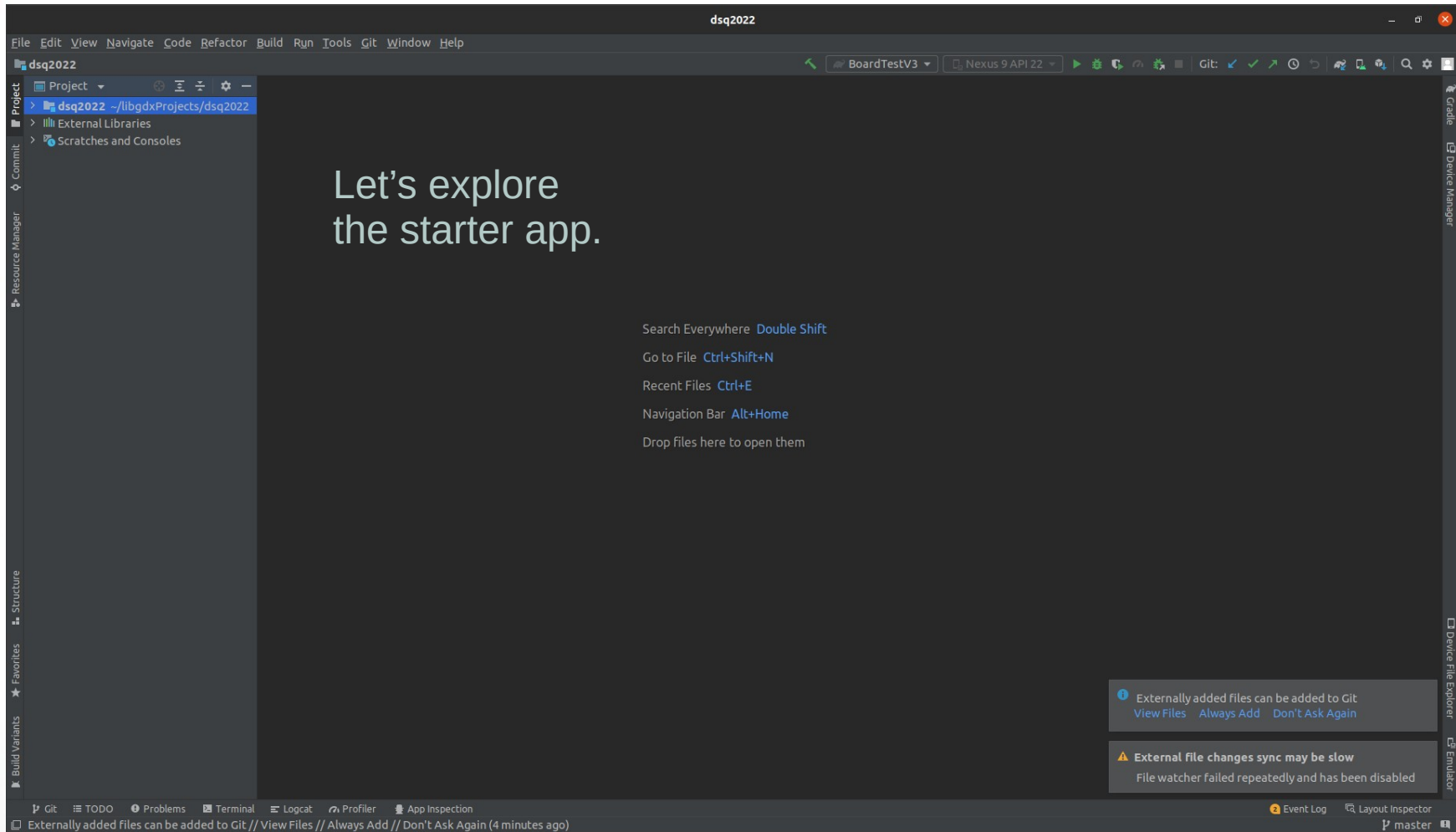
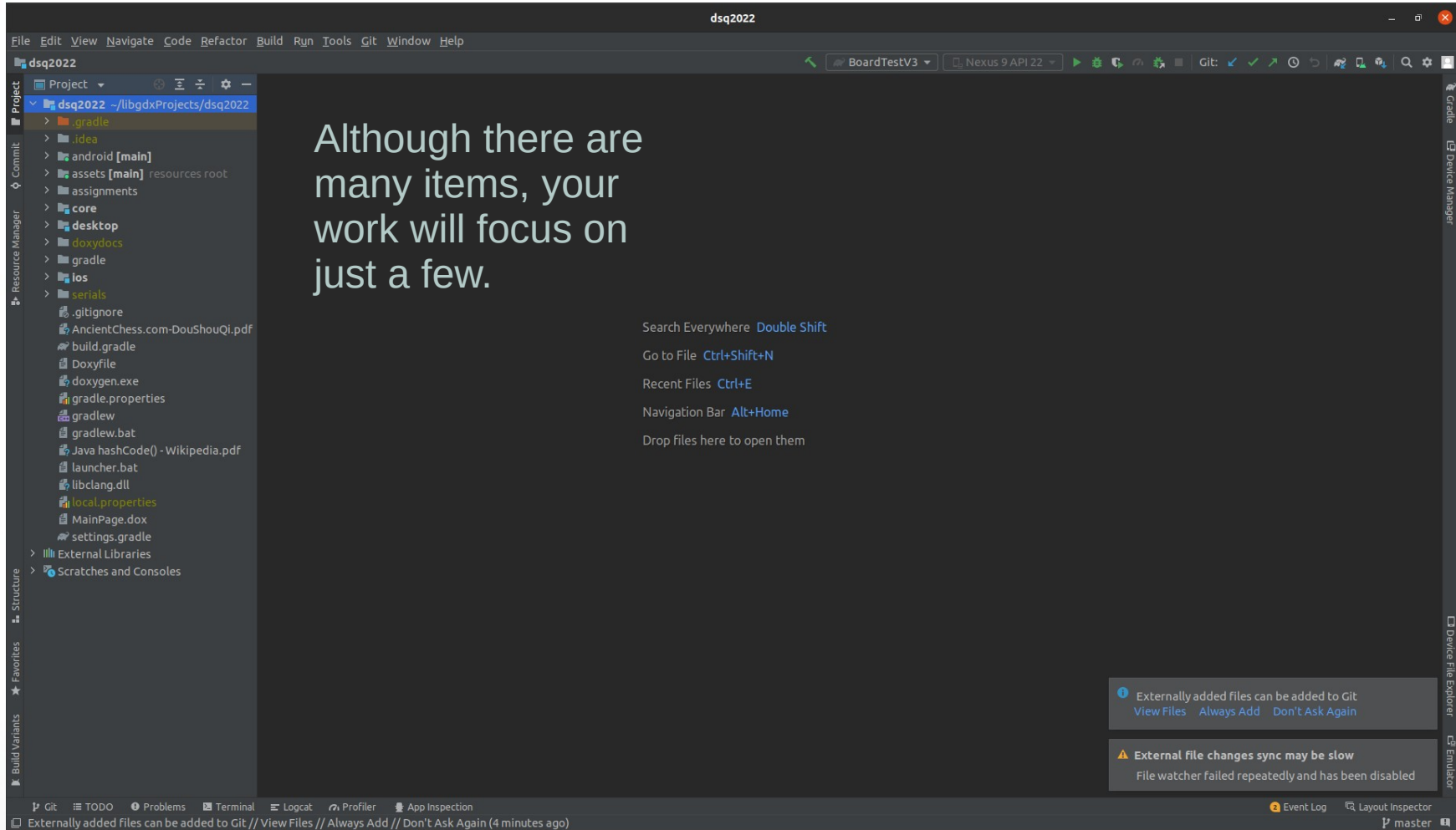
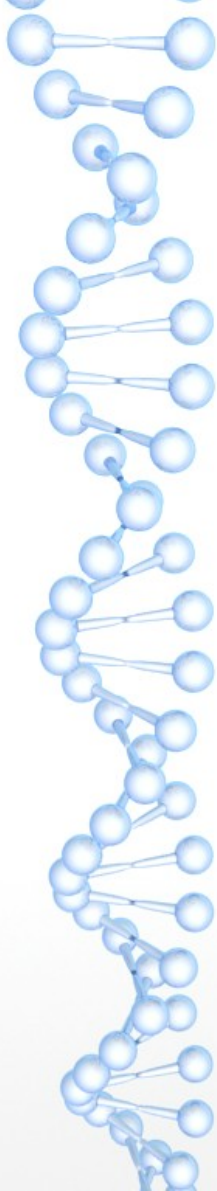
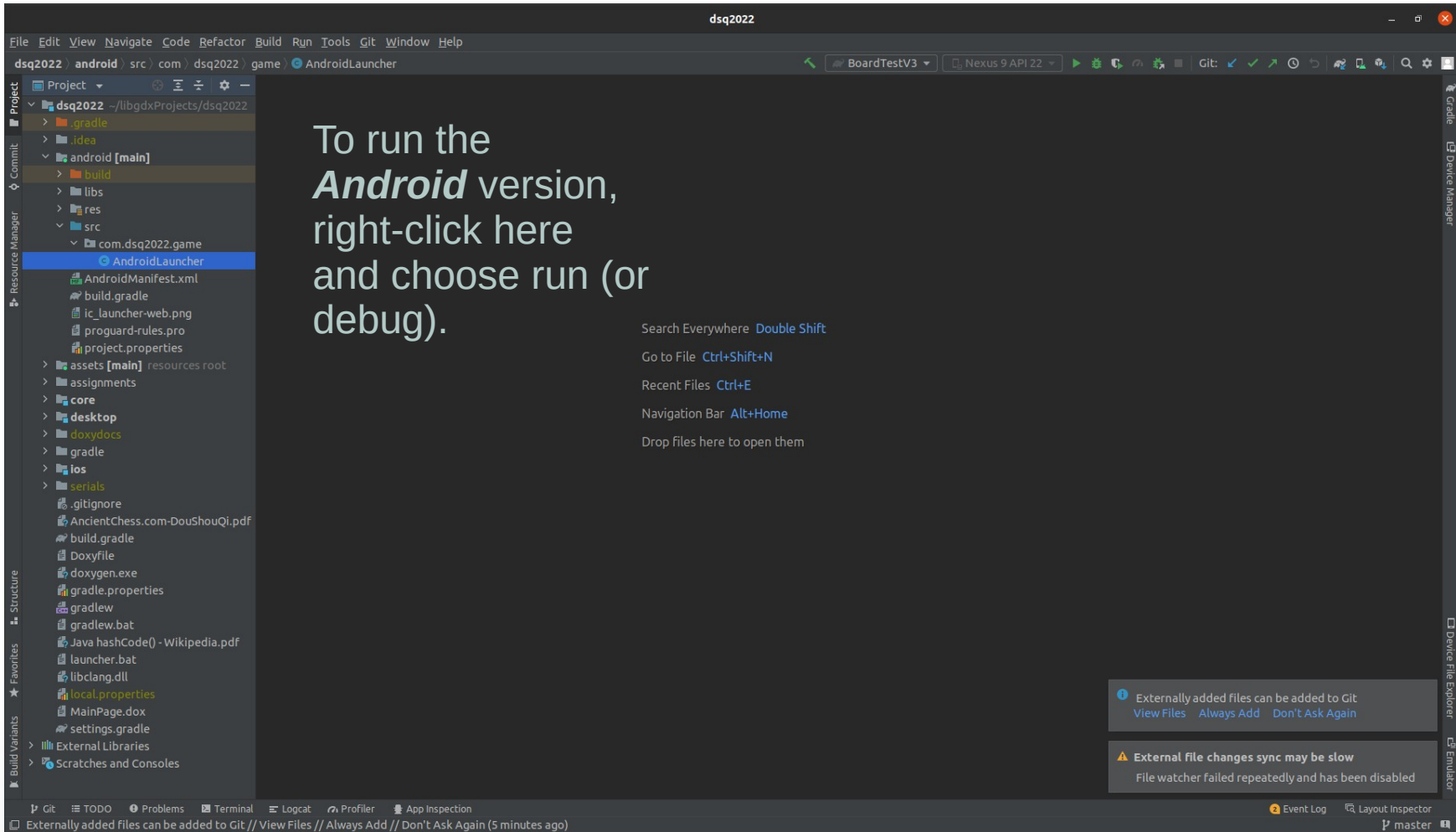
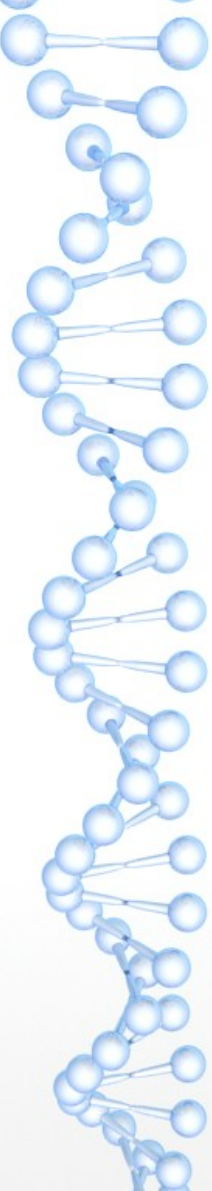


Dou Shou Qi (animal chess) cont'd.

assignment starter code







To run the **Android** version, right-click here and choose run (or debug).

Search Everywhere [Double Shift](#)

Go to File [Ctrl+Shift+N](#)

Recent Files [Ctrl+E](#)

Navigation Bar [Alt+Home](#)

Drop files here to open them

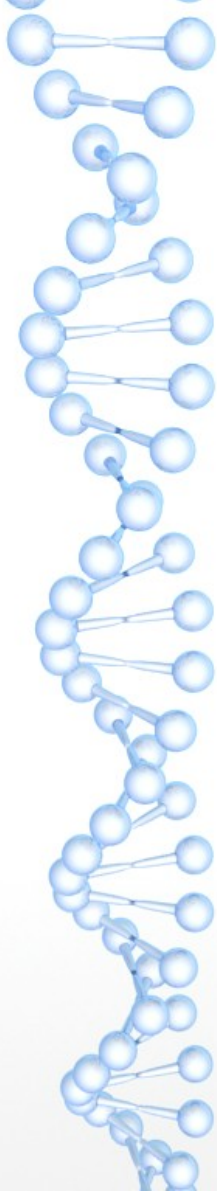
Externally added files can be added to Git
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External file changes sync may be slow
File watcher failed repeatedly and has been disabled

Git TODO Problems Terminal Logcat Profiler App Inspection

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Event Log Layout Inspector master



dsq2022

File Edit View Navigate Code Refactor Build Run Tools Git Window Help

dsq2022 ios src com dsq2022 game IOSLauncher

BoardTestV3 Nexus 9 API 22

Project dsq2022 ~/libgdxProjects/dsq2022

- .gradle
- .idea
- android [main]
- assets [main] resources root
- assignments
- core
- desktop
- doxydocs
- gradle
- ios
 - build
 - data
 - src [main] sources root
 - com.dsq2022.game
 - IOSLauncher**
- build.gradle
- Info.plist.xml
- robvm.properties
- robvm.xml
- serials
- .gitignore
- AncientChess.com-DouShouQi.pdf
- build.gradle
- Doxyfile
- doxygen.exe
- gradle.properties
- gradlew
- gradlew.bat
- Java hashCode() - Wikipedia.pdf
- launcher.bat
- libclang.dll
- local.properties
- MainPage.dox
- settings.gradle
- External Libraries
- Scratches and Consoles

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Drop files here to open them

Externally added files can be added to Git
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External file changes sync may be slow
File watcher failed repeatedly and has been disabled

Git TODO Problems Terminal Logcat Profiler App Inspection

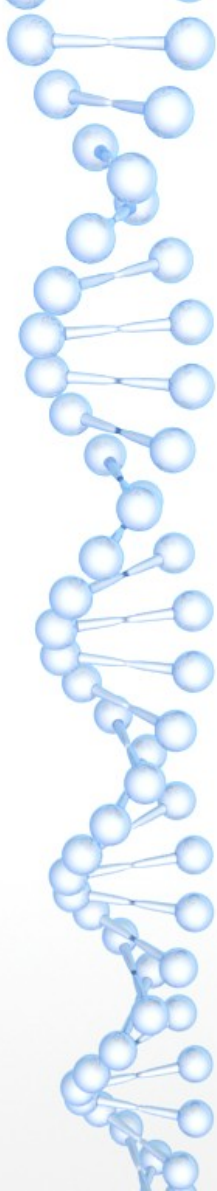
Externally added files can be added to Git // View Files // Always Add // Don't Ask Again (7 minutes ago)

Event Log Layout Inspector

master

To run the **IOS** version, right-click here and choose run (or debug).

(I have no experience with this.)



dsq2022

File Edit View Navigate Code Refactor Build Run Tools Git Window Help

dsq2022 desktop src com dsq2022 game DesktopLauncher

BoardTestV3 Nexus 9 API 22

Project dsq2022 ~/libgdxProjects/dsq2022

- .gradle
- .idea
- android [main]
- assets [main] resources root
- assignments
- core
- desktop
 - .gradle
 - build
 - src [main] sources root
 - com.dsq2022.game
- DesktopLauncher

build.gradle

- doxydocs
- gradle
- ios
- serials

.gitignore

AncientChess.com-DouShouQi.pdf

build.gradle

Doxyfile

doxygen.exe

gradle.properties

gradlew

gradlew.bat

Java hashCode() - Wikipedia.pdf

launcher.bat

libclang.dll

local.properties

MainPage.dox

settings.gradle

External Libraries

Scratches and Consoles

Search Everywhere Double Shift

Go to File Ctrl+Shift+N

Recent Files Ctrl+E

Navigation Bar Alt+Home

Drop files here to open them

Externally added files can be added to Git
[View Files](#) [Always Add](#) [Don't Ask Again](#)

External file changes sync may be slow
File watcher failed repeatedly and has been disabled

Git TODO Problems Terminal Logcat Profiler App Inspection

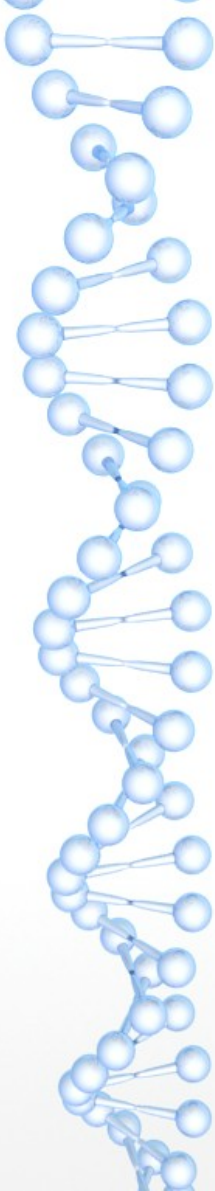
Externally added files can be added to Git // View Files // Always Add // Don't Ask Again (8 minutes ago)

Event Log Layout Inspector

master

To run the *desktop* version (Windows, Linux, Mac OS), right-click here and choose run (or debug).

Start with this.



dsq2022

File Edit View Navigate Code Refactor Build Run Tools Git Window Help

dsq2022 android

Project

- Project
- dsq2022 ~/libgdxProjects/dsq2022
 - .gradle
 - .idea
 - android [main]
 - assets [main] resources root
 - assignments
 - core
 - .gradle
 - build
 - src [main] sources root
 - main.java.com.dsq2022.game
 - Base
 - Board
 - DSQ2022Game
 - GameColor
 - GetMove.java
 - MainController
 - MainView
 - Piece
 - PrefController
 - PublicForTesting
 - test
 - build.gradle

- desktop
- doxydocs
- gradle
- ios
- serials
- .gitignore
- AncientChess.com-DouShouQi.pdf
- build.gradle
- Doxyfile
- doxygen.exe
- gradle.properties
- gradlew
- gradlew.bat
- Java hashCode() - Wikipedia.pdf
- launcher.bat
- libclang.dll
- local.properties
- Build Variants
- Structure
- Favorites

Resource Manager

Commit

Device Manager

Crash

Device File Explorer

Emulator

Search Everywhere Double Shift

Go to File Ctrl+Shift+N

Recent Files Ctrl+E

Navigation Bar Alt+Home

Drop files here to open them

Externally added files can be added to Git
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External file changes sync may be slow
File watcher failed repeatedly and has been disabled

Git TODO Problems Terminal Logcat Profiler App Inspection

Externally added files can be added to Git // View Files // Always Add // Don't Ask Again (6 minutes ago)

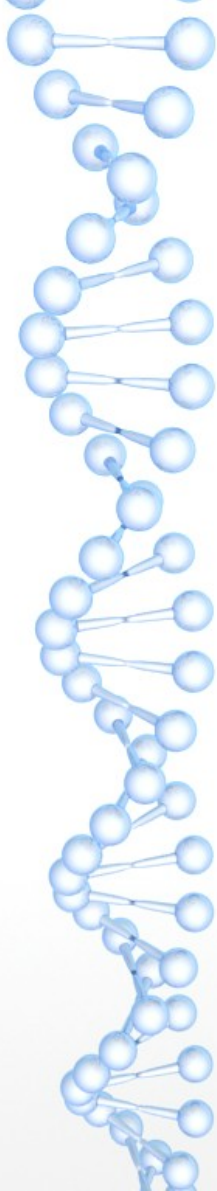
Event Log Layout Inspector

master

This (Board.java) is where you will do all of your work.

We will visit it shortly.

Do not change anything else!



dsq2022

File Edit View Navigate Code Refactor Build Run Tools Git Window Help

dsq2022 android

Project

- Project
- dsq2022 ~/libgdxProjects/dsq2022
 - .gradle
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 - build
 - src [main] sources root
 - main.java.com.ds2022.game
 - Base
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 - DSQ2022Game
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 - PublicForTesting
 - test
 - build.gradle
 - desktop
 - doxydocs
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 - ios
 - serials
- Structure
 - .gitignore
 - AncientChess.com-DouShouQi.pdf
 - build.gradle
 - Doxyfile
 - doxygen.exe
 - gradle.properties
 - gradlew
 - gradlew.bat
 - Java hashCode() - Wikipedia.pdf
 - launcher.bat
 - libclang.dll
 - local.properties
- Build Variants

Resource Manager

Commit

Device Manager

Device File Explorer

Emulator

Search Everywhere Double Shift

Go to File Ctrl+Shift+N

Recent Files Ctrl+E

Navigation Bar Alt+Home

Drop files here to open them

Externally added files can be added to Git
[View Files](#) [Always Add](#) [Don't Ask Again](#)

External file changes sync may be slow
File watcher failed repeatedly and has been disabled

Git TODO Problems Terminal Logcat Profiler App Inspection

Externally added files can be added to Git // View Files // Always Add // Don't Ask Again (6 minutes ago)

Event Log Layout Inspector

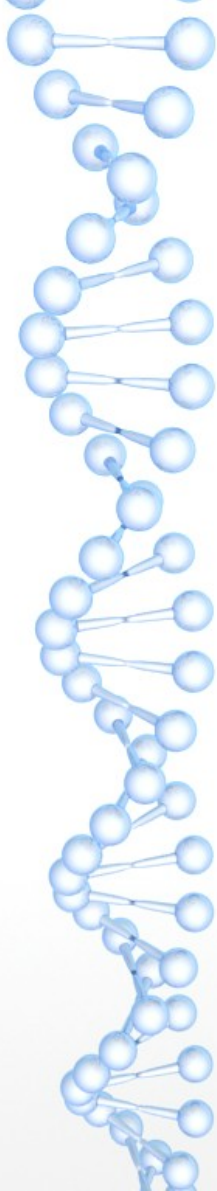
master



Base.java

```
package com.ds2022.game;

/**
 * Define constants for the board itself.
 * These never move as they are part of the board.
 *
 * Copyright © George J. Grevera, 2016. All rights reserved.
 */
public enum Base {
    cGround,    ///< ordinary ground
    cWater,     ///< water
    cRTrap,     ///< red (side of board) trap
    cBTrap,     ///< blue (side of board) trap
    cRDen,      ///< red (side of board) den
    cBDen,      ///< blue (side of board) den
    cNone       ///< not used/out of bounds
}
```



dsq2022

File Edit View Navigate Code Refactor Build Run Tools Git Window Help

dsq2022 android

Project

- Project
- dsq2022 ~/libgdxProjects/dsq2022
 - .gradle
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Resource Manager

Structure

Build Variants

GameColor.java

You will also need to be familiar with GameColor.java.

Search Everywhere Double Shift

Go to File Ctrl+Shift+N

Recent Files Ctrl+E

Navigation Bar Alt+Home

Drop files here to open them

Externally added files can be added to Git
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External file changes sync may be slow
File watcher failed repeatedly and has been disabled

Git TODO Problems Terminal Logcat Profiler App Inspection

Externally added files can be added to Git // View Files // Always Add // Don't Ask Again (6 minutes ago)

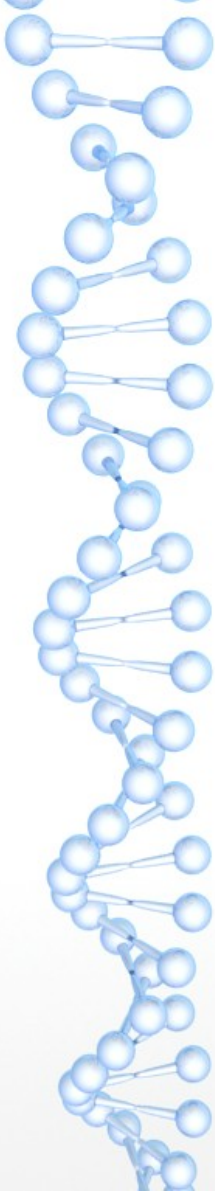
Event Log Layout Inspector

master



GameColor.java

```
package com.dsqa2022.game;  
  
/**  
 * Color of piece (or none).  
 *  
 * Copyright © George J. Grevera, 2016. All rights reserved.  
 */  
public enum GameColor {  
    None,  
    Red,  
    Blue  
}
```



dsq2022

File Edit View Navigate Code Refactor Build Run Tools Git Window Help

dsq2022 android

Project

- Project
- dsq2022 ~/libgdxProjects/dsq2022
 - .gradle
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 - android [main]
 - assets [main] resources root
 - assignments
 - core
 - .gradle
 - build
 - src [main] sources root
 - main.java.com.dsq2022.game
 - Base
 - Board
 - DSQ2022Game
 - GameColor
 - GetMove.java
 - MainController
 - MainView
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 - gradle
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 - serials

Resource Manager

Structure

Build Variants

Search Everywhere Double Shift

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Recent Files Ctrl+E

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Drop files here to open them

You will also need to be familiar with Piece.java.

Externally added files can be added to Git
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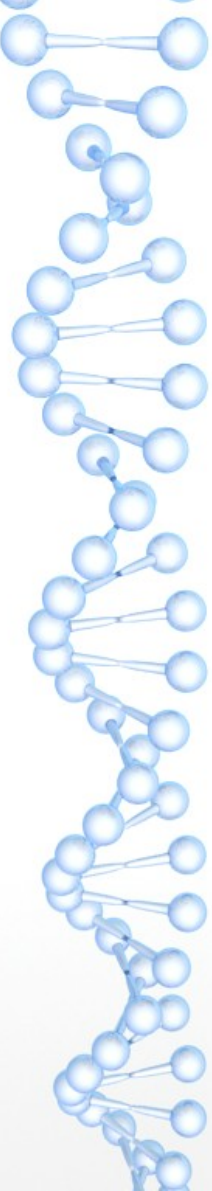
External file changes sync may be slow
File watcher failed repeatedly and has been disabled

Git TODO Problems Terminal Logcat Profiler App Inspection

Externally added files can be added to Git // View Files // Always Add // Don't Ask Again (6 minutes ago)

Event Log Layout Inspector

master



```
package com.ds2022.game;
```

```
/**
```

Piece.java

```
 * Define constants for moveable playing pieces (or none).
```

```
 * <a href="https://docs.oracle.com/javase/tutorial/java/java00/enum.html">Here</a>
```

```
 * is a nice discussion regarding enum's in Java.
```

```
 *
```

```
 * This is how one would do an enum in C/C++. However, Java enum's are more "powerful."
```

```
 * <pre>
```

```
 *     public enum Piece {
```

```
 *         rbNone, //no piece present
```

```
 *         //red pieces
```

```
 *         rRat, rCat, rDog, rWolf, rLeopard, rTiger, rLion, rElephant,
```

```
 *         //blue pieces
```

```
 *         bRat, bCat, bDog, bWolf, bLeopard, bTiger, bLion, bElephant
```

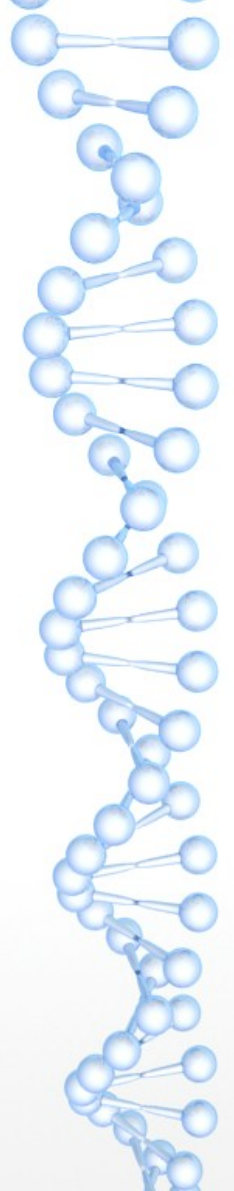
```
 *     }
```

```
 * </pre>
```

```
 *
```

```
 * Copyright © George J. Grevera, 2016. All rights reserved.
```

```
 */
```



```
public enum Piece {  
    rbNone(    GameColor.None ), //no piece present  
    //red pieces  
    rRat(      GameColor.Red ),  
    rCat(      GameColor.Red ),  
    rDog(      GameColor.Red ),  
    rWolf(     GameColor.Red ),  
    rLeopard(  GameColor.Red ),  
    rTiger(    GameColor.Red ),  
    rLion(     GameColor.Red ),  
    rElephant( GameColor.Red ),  
    //blue pieces  
    bRat(      GameColor.Blue ),  
    bCat(      GameColor.Blue ),  
    bDog(      GameColor.Blue ),  
    bWolf(     GameColor.Blue ),  
    bLeopard(  GameColor.Blue ),  
    bTiger(    GameColor.Blue ),  
    bLion(     GameColor.Blue ),  
    bElephant( GameColor.Blue );  
  
    public final GameColor color;  
    /** This ctor is never used directly. */  
    private Piece ( GameColor c ) { this.color = c; }  
}
```

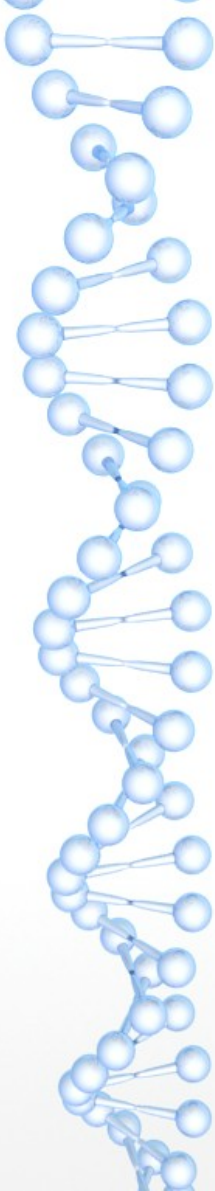
Piece.java

Enums are simply a way of defining constants. They are a more elegant alternative to the following:

```
public class Piece {  
    public static final int rbNone = 0;  
    public static final int rRat = 1;  
    public static final int rCat = 2;  
    ...  
}
```

Examples:

```
Piece p = Piece.bDog;  
System.out.println( p.color );
```

dsq2022

File Edit View Navigate Code Refactor Build Run Tools Git Window Help

dsq2022 android

Project

- dsq2022 ~/libgdxProjects/dsq2022
 - .gradle
 - .idea
 - android [main]
 - assets [main] resources root
 - assignments
 - core
 - .gradle
 - build
 - src [main] sources root
 - main.java.com.dsq2022.game
 - Base
 - Board
 - DSQ2022Game
 - GameColor
 - GetMove.java
 - MainController
 - MainView
 - Piece
 - PrefController
 - PublicForTesting
 - test
 - build.gradle

Resource Manager

Structure

- desktop
- doxydocs
- gradle
- ios
- serials
- .gitignore
- AncientChess.com-DouShouQi.pdf
- build.gradle
- Doxyfile
- doxygen.exe
- gradle.properties
- gradlew
- gradlew.bat
- Java hashCode() - Wikipedia.pdf
- launcher.bat
- libclang.dll
- local.properties

Build Variants

Search Everywhere Double Shift

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Drop Files here to open them

FYI.

This code follows the MVC (Model-View-Controller) pattern (<https://en.wikipedia.org/wiki/Model%E2%80%93view%E2%80%93controller>).

The model is Board.java.

The view is MainView.java.

The controller is MainController.java.

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View Files Always Add Don't Ask Again

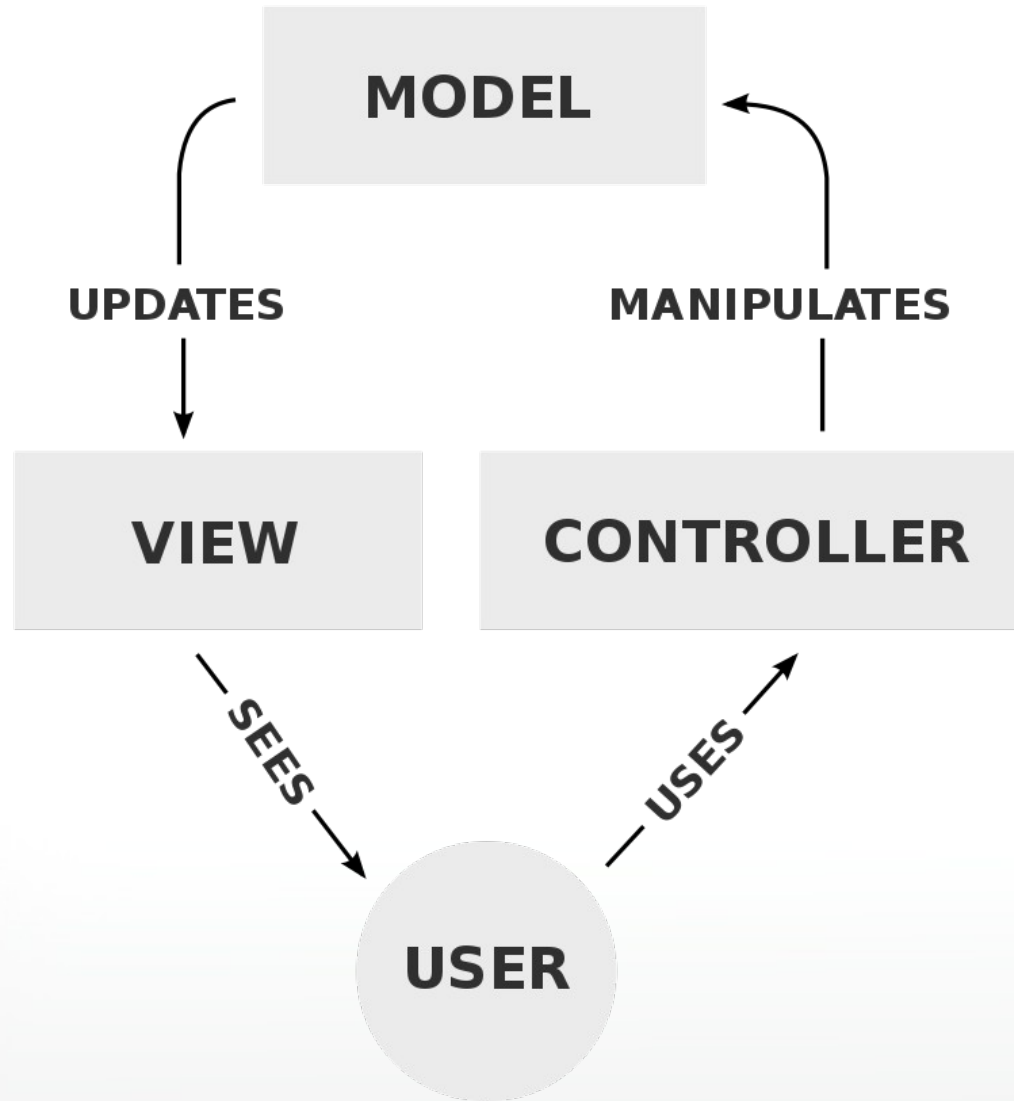
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File watcher failed repeatedly and has been disabled

Git TODO Problems Terminal Logcat Profiler App Inspection

Externally added files can be added to Git // View Files // Always Add // Don't Ask Again (6 minutes ago)

Event Log Layout Inspector

master





```
public class Board implements Serializable {
```

```
    private static final long serialVersionUID = 208041731299892L;
```

Board.java

```
    // constants for the size of the Board
```

```
    public static final int  fRows = 9; ///< no. of Board rows
```

```
    public static final int  fCols = 7; ///< no. of Board cols
```

```
    // the (underlying) playing surface/base. base[0][0] is the upper left corner.
```

```
    public Base[][] base = new Base[ fRows ][ fCols ];
```

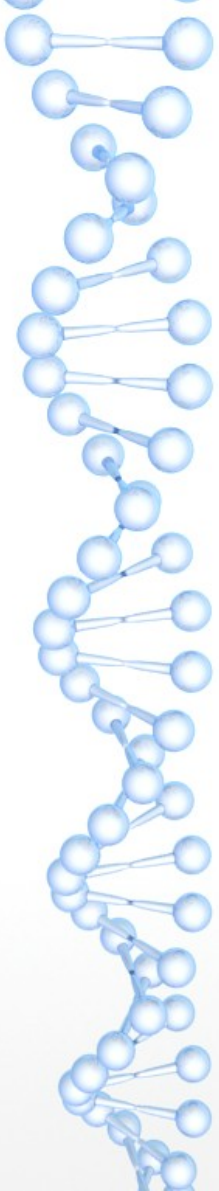
```
    // the noveable pieces on the playing Board. piece[0][0] is the upper left corner.
```

```
    public Piece[][] piece = new Piece[ fRows ][ fCols ];
```

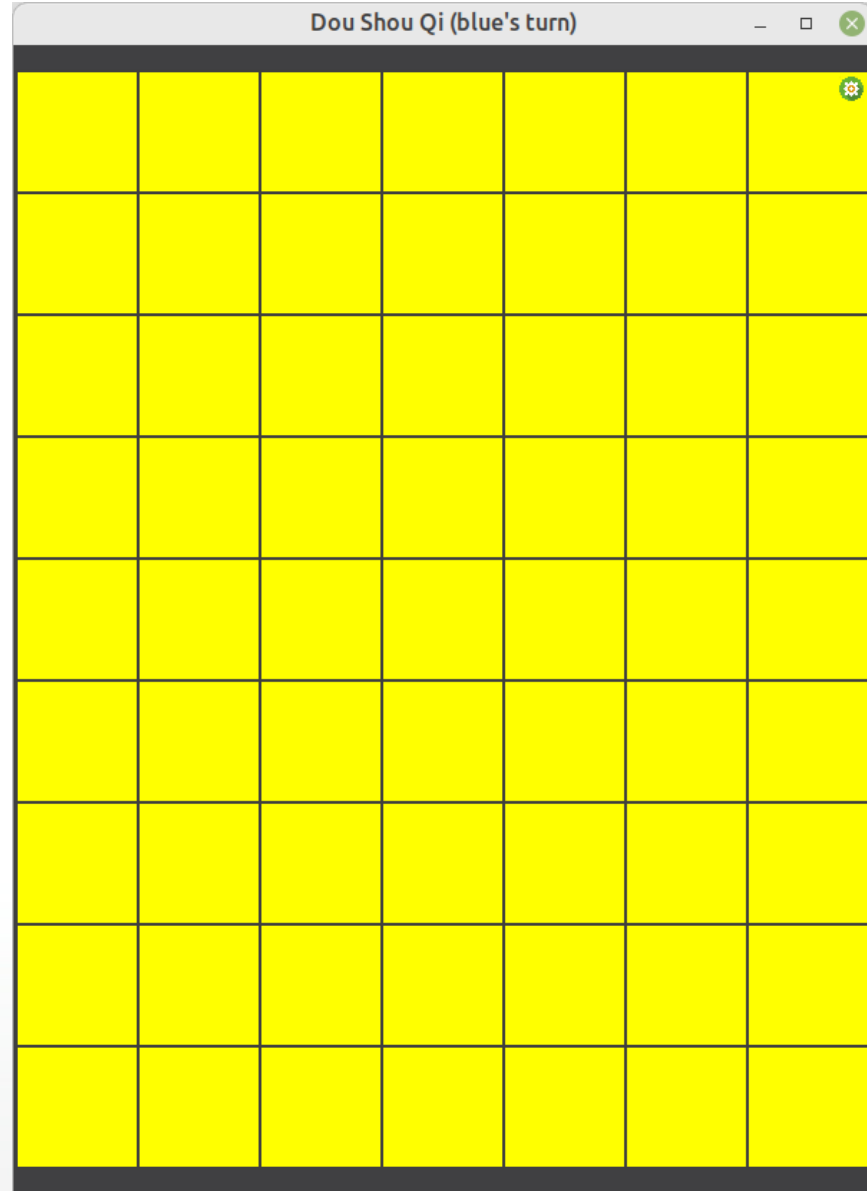
```
    public boolean  bluesTurn = true; ///< by convention, blue goes first
```

```
    public boolean  moveWasCapture = false; ///< last move resulted in a capture
```

```
    public static final boolean  universalTraps = true; ///< all traps are universal (see 17  
below)
```

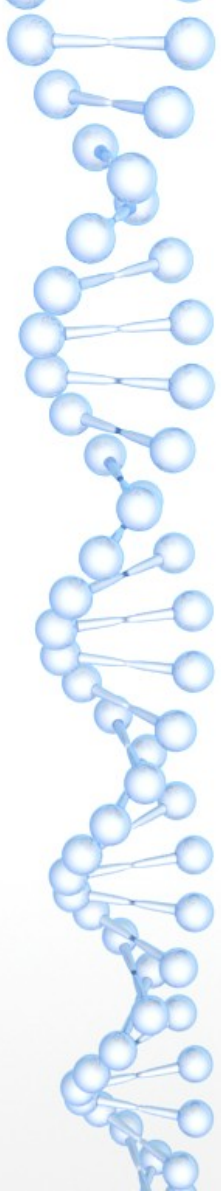
This is the result.





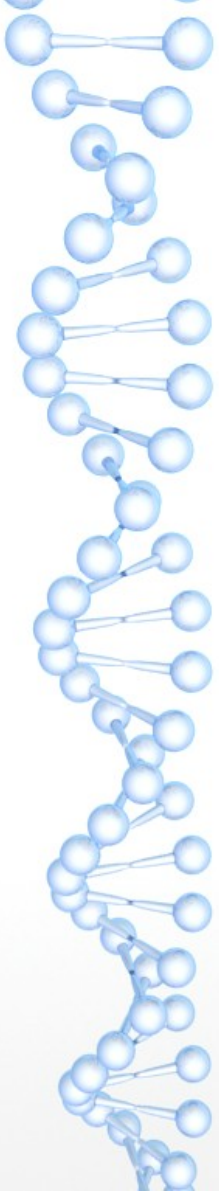
Version 1 assignment: Board.java.

Please do not change any other files.

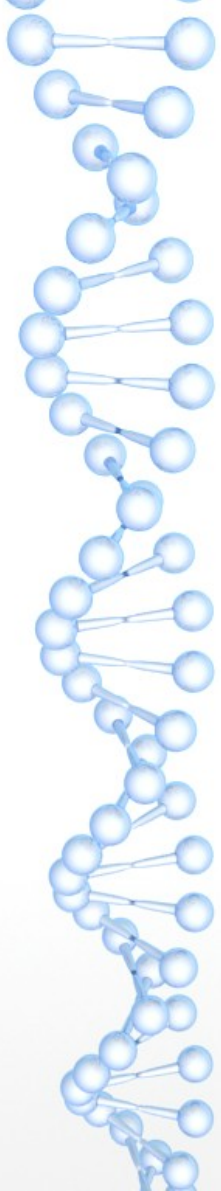


```
/** Init the Board. The "Board" consists of the base which doesn't change
 * and the pieces which move.
 * By convention, red will initially be in the top half (0,0) of the
 * Board, and blue will start in the bottom half. be careful. the
 * opposite sides do not mirror each other!
 * @todo v1
 */
public Board ( ) {
    //init the underlying Board base
    //this.base[0][0] = Base.cGround;
    // ...

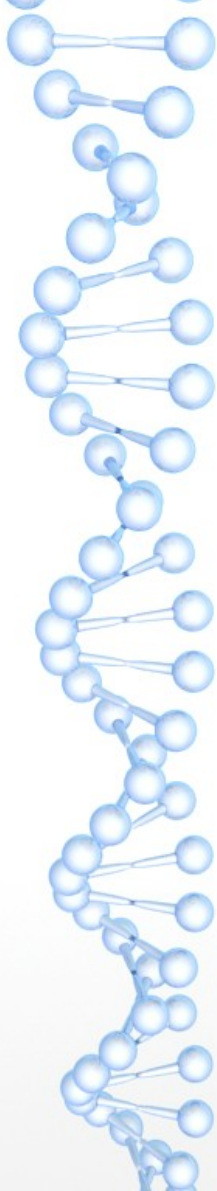
    //place the pieces
    //this.piece[0][0] = Piece.rLion;
    // ...
}
```



```
/** @return the specific (moveable) piece (e.g., bWolf or rbNone) at the  
 * indicated position.  
 * @todo v1  
 */  
public Piece getPiece ( int r, int c ) {  
    return Piece.rbNone;  
}
```



```
/** @return what appears on the underlying Board base at the specified position  
 * (e.g., cWater), or cNone if out of bounds.  
 * @todo v1  
 */  
public Base getBase ( int r, int c ) {  
    return Base.cNone;  
}
```

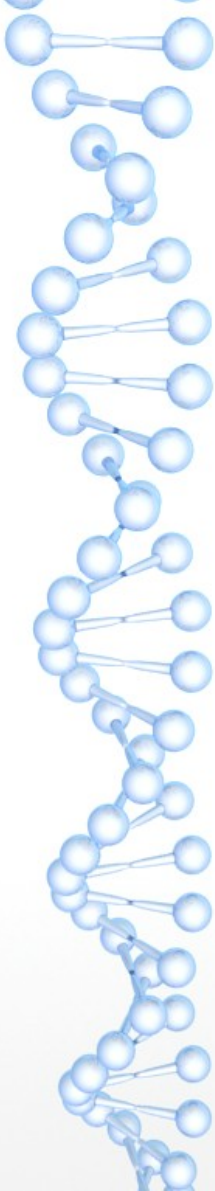


```
/** @return a string representing the Board that can be pretty-printed.
 * It should look something like the following:
 * <pre><code>
 *      - - - - -      - - - - -      \\n
 *      |          |      |          |      \\n
 *      .          .      .          .      .
 *      .          .      .          .      .
 *      .          .      .          .      .
 *      |          |      |          |      \\n
 *      - - - - -      - - - - -      \\n
 * </code></pre>
 * The left side of the string should be the underlying Board base.
 * The right side should be the pieces at their specific locations.
 * Put the first 3 characters of the name at each location
 * (e.g., rLi for the red lion, and bEl for the blue elephant).
 * If you have a better idea, please let me know!
 * @todo v1
 */
@Override public String toString ( ) {
    return "";
}
```

Note:

\\n is used in the comments so it will appear in the documentation.

You should only use \\n in your code.



```
/** @return a string representing the Board that can be pretty-printed.
 * It should look something like the following:
 * <pre><code>
 *      - - - - -      - - - - -      \\n
 *      |          |          |          |      \\n
 *      .          .          .          .      .
 *      .          .          .          .      .
 *      .          .          .          .      .
 *      |          |          |          |      \\n
 *      - - - - -      - - - - -      \\n
 * </code></pre>
 * The left side of the string should be the underlying Board base.
 * The right side should be the pieces at their specific locations.
 * Put the first 3 characters of the name at each location
 * (e.g., rLi for the red lion, and bEl for the blue elephant).
 * If you have a better idea, please let me know!
 * @todo v1
 */
@Override public String toString ( ) {
    return "";
}
```

This is also acceptable but will not receive full credit:

```
base: \n
- - - - -  \n
|          | \n
.          .
.          .
.          .
|          | \n
- - - - -  \n
pieces: \n
- - - - -  \n
|          | \n
.          .
.          .
.          .
|          | \n
- - - - -  \n
```

File Edit View Navigate Code Refactor Build Run Tools Git Window Help

dsq2020 > desktop > src > com > dsq2022 > game > DesktopLauncher

Project

- Android
 - android
 - manifests
 - java
 - java (generated)
 - assets
 - jniLibs
 - res
 - res (generated)
 - core
 - main
 - java
 - main.java.com.ds2022.game
 - Base
 - Board
 - DSQ2022Game
 - GameColor
 - GetMove.java
 - MainController
 - MainView
 - Piece
 - PrefController
 - PublicForTesting

test ~/AndroidStudioProjects/dsq2

Search Everywhere Double Shift

Go to File Ctrl+Shift+N

Recent Files Ctrl+E

Navigation Bar Alt+Home

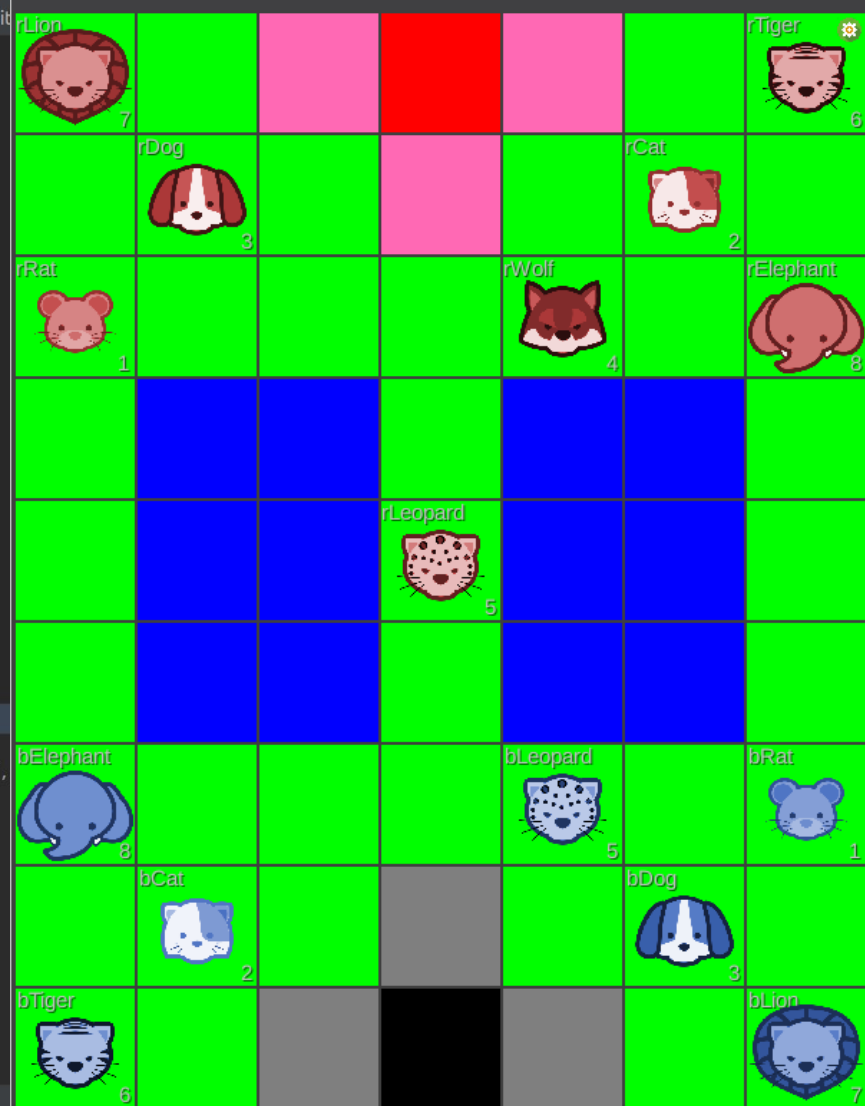
Drop files here to open them

Run: dsq2020:desktop [desktop:DesktopLauncher.main]

dsq2020:desktop [desktop:DesktopLauncher.main] 1 sec

dsq2020:desktop [desktop:DesktopLauncher.main] 1 sec

```
> Task :desktop:DesktopLauncher.main()
load board: {base:[cGround,cGround,cRTrip,cRDen,cRTrip,cGround,cGround],
|G G RT RD RT G G | |rLi . . . . rTi |
|G G G RT G G G | |. rDo . . . . rCa . |
|G G G G G G G | |rRa . . . . rWo . rEL |
|G W W G W W G | |. . . . . rLe . . . |
|G W W G W W G | |. . . . . rLe . . . |
|G G G G G G G | |bEL . . . . bLe . bRa |
|G G G BT G G G | |. bCa . . . . bDo . |
|G G BT BD BT G G | |bTi . . . . . bLi |
[ bluesTurn=true isBlueWinner=false isRedWinner=false gameOver=false ]
key: rat is 1, cat is 2, dog is 3, wolf is 4,
leopard is 5, tiger is 6, lion is 7, elephant is 8.
```



Executing tasks: [desktop:DesktopLauncher.main()] in project /home/george/AndroidStudioProjects/ds... (moments ago) | Gradle Build Running

If you don't already know ...
please learn how to use the debugger.



dsq2020 – Board.java [dsq2020.core.main]

File Edit View Navigate Code Refactor Build Run Tools Git Window Help

src > main > java > com > dsq2022 > game > Board > toString DesktopLauncher Pixel XL API 33 Git

Project

- android
 - manifests
 - java
 - java (generated)
 - assets
 - jniLibs
 - res
 - res (generated)
- core
 - main
 - java
 - main.java.com.dsq2022.game
 - Base
 - Board
 - DSQ2022Game
 - GameColor
 - GetMove.java
 - MainController
 - MainView
 - Piece
 - PrefController

Resource Manager

Commit

Device Manager

Board.java

```
380 s += gameOver() + this.gameOver() + "\n";
381 s += "]\n";
382 s += "\nkey: rat is 1, cat is 2, dog is 3, wolf is 4, \n    leopard is 5, tiger is 6, lion is 7, elephant is 8, \n";
383
384 return s;
385 }
386
387 /** Set the piece at the specified position (r,c).
388  * This function should NOT change the underlying Board pieces contents
389  * (e.g., cWater) at the specified location.
390  * @param r is the row
391  * @param c is the col
392  * @param p should/must be rbNone or rRat ... rElephant or rWater
393  * @param bElephant.
394  * @todo v2
395  */
396 public void setPiece ( int r, int c, Piece p ) {
397     //solution:
398     //bounds check
399     if ( r < 0 || c < 0 || r >= fRows || c >= fCols ) return;
400     this.piece[r][c] = p;
401 }
402
```

Set a breakpoint(s) in your code by clicking in the margin. A red dot will appear.

Debug: dsq2020.desktop [:desktop:DesktopLauncher.mai...]

Debugger Console

Frames Variables Coroutines

Frames are not available

Variables are not available

Build Variants

Event Log Layout Inspector

Gradle build cancelled with 1 error(s) in 1 m 26 s 208 ms (2 minutes ago)

384:1 LF UTF-8 4 spaces master

dsq2020 – Board.java [dsq2020.core.main]

File Edit View Navigate Code Refactor Build Run Tools Git Window Help

src > main > java > com > dsq2022 > game > Board > toString DesktopLauncher Pixel XL API 33

Project

- android
 - manifests
 - java
 - java (generated)
 - assets
 - jniLibs
 - res
 - res (generated)
- core
 - main
 - main.java.com.dsq2022.game
 - Base
 - Board
 - DSQ2022Game
 - GameColor
 - GetMove.java
 - MainController
 - MainView
 - Piece
 - PrefController

Resource Manager

Commit

Device Manager

Board.java

```
380 s += gameOver + " " + this.gameOver() + "\n";
381 s += "]\n";
382 s += "\nkey: rat is 1, cat is 2, dog is 3, wolf is 4, \n    leopard is 5, tiger is 6, lion is 7, elephant is 8\n";
383
384 return s;
385 }
386
387 /** Set the piece at the specified position (r,c).
388  * This function should NOT change the underlying Board pieces contents
389  * (e.g., cWater) at the specified location.
390  * @param r is the row
391  * @param c is the col
392  * @param p should/must be rbNone or rRat ... rElephant or rWater.
393  * @todo v2
394  */
395
396 public void setPiece ( int r, int c, Piece p ) {
397     //solution:
398     //bounds check
399     if ( r < 0 || c < 0 || r >= fRows || c >= fCols ) return;
400     this.piece[r][c] = p;
401 }
402
```

Instead of running by clicking on the green triangle, click on the green bug to start debugging.

Debug: dsq2020.desktop [:desktop:DesktopLauncher.mai...]

Debugger Console

Frames Variables Coroutines

Frames are not available

Variables are not available

Git Run Debug TODO Problems Terminal Logcat Build Profiler App Inspection

Gradle build cancelled with 1 error(s) in 1 m 26 s 208 ms (2 minutes ago)

384:1 LF UTF-8 4 spaces master

dsq2020 - Board.java [dsq2020.core.main]

File Edit View Navigate Code Refactor Build Run Tools Git Window Help

dsq2020 > core > src > main > java > com > dsq2022 > game > Board DesktopLauncher Pixel XL API 33 Git

Project android manifests java java (generated) assets jniLibs res res (generated) core main main.java.com.ds2022.game Base Board DSQ2022Game GameColor GetMove.java MainController MainView Piece PrefController

Board.java

```
380 s += gameOver() + this.gameOver() + "\n";
381 s += "]\n";
382 s += "\nkey: rat is 1, cat is 2, dog is 3, wolf is 4, \n Leopard is 5, tiger is 6, lion is 7, elephant is 8, \n";
383
384 return s; s: "[G G RT RD RT G G | |rLi . . . . rTi | \n[G G G RT G G G | | . ... View
385 }
386 //=====
387 /** Set the piece at the specified position (r,c).
388 * This function should NOT change the underlying Board pieces contents
389 * (e.g., cWater) at the specified location.
390 * @param r is the row
391 * @param c is the col
392 * @param p should/must be rbNone or rRat ... rElephant or rRat ...
393 * bElephant.
394 * @todo v2
395 */
396 public void setPiece ( int r, int c, Piece p ) {
397 //solution:
398 //bounds check
399 if ( r < 0 || c < 0 || r >= fRows || c >= fCols ) return;
400 this.piece[r][c] = p;
401 }
402 //=====
```

Now execution has paused at the breakpoint.

Debug: dsq2020.desktop [:desktop:DesktopLauncher.mai...]

Debugger Console Variables Coroutines

Frames Variables Coroutines

✓ "main"...UNNING ↑ ↓ ▼ + > this = {Board@1149} "[G G RT RD RT G G | |rLi rTi | \n[G G G RT G G G | | View > Coroutines

toString:384, Board (com.ds2022.game) s = "[G G RT RD RT G G | |rLi rTi | \n[G G G RT G G G | | . rDo . . . rCa . |... View

valueOf:2951, String (java.lang)

println:897, PrintStream (java.io)

init:43, DSQ2022Game (com.ds2022)

create:25, DSQ2022Game (com.ds2022)

addListener:416, Lwjgl3Window (com.ds2022)

update:366, Lwjgl3Window (com.ds2022)

loop:192, Lwjgl3Application (com.ds2022)

<init>:166, Lwjgl3Application (com.ds2022)

main:16, DesktopLauncher (com.ds2022)

Skipped breakpoint at com.ds2022.game.Board:384 because it happened inside debugger evaluation

Git Run Debug TODO Problems Terminal Logcat Build Profiler App Inspection Event Log Layout Inspector

Executing tasks: [:desktop:DesktopLauncher.main()] in project /home/george/... (moments ago) Gradle Build Running 384:1 LF UTF-8 4 spaces master

dsq2020 - Board.java [dsq2020.core.main]

File Edit View Navigate Code Refactor Build Run Tools Git Window Help

dsq2020 > core > src > main > java > com > dsq2022 > game > Board DesktopLauncher Pixel XL API 33 Git

Project android > manifests > java > java (generated) > assets > jniLibs > res > res (generated) core > main > java > main.java.com.ds2022.game > Base > Board DSQ2022Game GameColor GetMove.java MainController MainView Piece PrefController

```
380 s += gameOver + this.gameOver() + "\n";
381 s += "]\n";
382 s += "\nkey: rat is 1, cat is 2, dog is 3, wolf is 4, \n      Leopard is 5, tiger is 6, lion is 7, elephant is 8\n";
383
384 return s; s: "[G G RT RD RT G G | |rLi . . . . rTi | \n[G G G RT G G G | |. ... View
385 }
386 //=====
387 /** Set the piece at the specified position (r,c).
388  * This function should NOT change the underlying Board pieces contents
389  * (e.g., cWater) at the specified location.
390  * @param r is the row
391  * @param c is the col
392  * @param p should/must be rbNone or rRat ... rElephant or bRat ...
393  * bElephant.
394  * @todo v2
395  */
396 public void setPiece ( int r, int c, Piece p ) {
397     //solution:
398     //bounds check
399     if ( r < 0 || c < 0 || r >= fRows || c >= fCols ) return;
400     this.piece[r][c] = p;
401 }
402 //=====
```

Debug: dsq2020.desktop [:desktop:DesktopLauncher.mai... x

Debugger Console

Frames Variables Coroutines

✓ "main"...UNNING ↑ ↓ ▼ + > this = {Board@1149} "[G G RT RD RT G G | |rLi rTi | \n[G G G RT G G G | |. ... View > Coroutines

toString:384, Board (com.ds2022.game) s = "[G G RT RD RT G G | |rLi rTi | \n[G G G RT G G G | |. rDo . . . rCa . |... View

valueOf:2951, String (java.lang)

println:897, PrintStream (java.io)

init:43, DSQ2022Game (com.ds2022)

create:25, DSQ2022Game (com.ds2022)

addListener:416, Lwjgl3Window (com.badlogic.gdx)

update:366, Lwjgl3Window (com.badlogic.gdx)

loop:192, Lwjgl3Application (com.badlogic.gdx)

<init>:166, Lwjgl3Application (com.badlogic.gdx)

main:16, DesktopLauncher (com.ds2022)

Skipped breakpoint at com.ds2022.game.Board:384 because it happened inside debugger evaluation

Git Run Debug TODO Problems Terminal Logcat Build Profiler App Inspection Event Log Layout Inspector

Executing tasks: [:desktop:DesktopLauncher.main()] in project /home/george/... (moments ago) Gradle Build Running 384:1 LF UTF-8 4 spaces master

Device Manager Device File Explorer Emulator

We can control execution with these controls.

dsq2020 - Board.java [dsq2020.core.main]

File Edit View Navigate Code Refactor Build Run Tools Git Window Help

dsq2020 > core > src > main > java > com > dsq2022 > game > Board DesktopLauncher Pixel XL API 33

Project android > manifests > java > java (generated) > assets > jniLibs > res > res (generated) core > main > main.java.com.dsq2022.game > Base > Board DSQ2022Game GameColor GetMove.java MainController MainView Piece PrefController

Board.java

```
380 s += gameOver + this.gameOver() + "\n";
381 s += "]\n";
382 s += "\nkey: rat is 1, cat is 2, dog is 3, wolf is 4, \n      Leopard is 5, tiger is 6, lion is 7, elephant is 8\n";
383
384 return s; s: "|G G RT RD RT G G | |rLi . . . . rTi | \n|G G G RT G G G | | |
385 }
386 //=====
387 /** Set the piece at the specified position (r,c).
388  * This function should NOT change the underlying Board pieces contents
389  * (e.g., cWater) at the specified location.
390  * @param r is the row
391  * @param c is the col
392  * @param p should/must be rbNone or rRat ... rElephant or bRat ...
393  * bElephant.
394  * @todo v2
395  */
396 public void setPiece ( int r, int c, Piece p ) {
397     //solution:
398     //bounds check
399     if ( r < 0 || c < 0 || r >= fRows || c >= fCols ) return;
400     this.piece[r][c] = p;
401 }
402 //=====
```

Debug: dsq2020.desktop [:desktop:DesktopLauncher.main] x

Debugger Console

Frames Variables Coroutines

"main"...UNNING ↑ ↓ ▼ + > this = {Board@1149} "|G G RT RD RT G G | |rLi rTi | \n|G G G RT G G G | | ... View > Coroutines

toString:384, Board (com.dsq2022.game) s = "|G G RT RD RT G G | |rLi rTi | \n|G G G RT G G G | | . rDo . . . rCa . | ... View

valueOf:2951, String (java.lang)

println:897, PrintStream (java.io)

init:43, DSQ2022Game (com.dsq2022.game)

create:25, DSQ2022Game (com.dsq2022.game)

addListener:416, Lwjgl3Window (com.badlogic.gdx.backends.lwjgl3)

update:366, Lwjgl3Window (com.badlogic.gdx.backends.lwjgl3)

loop:192, Lwjgl3Application (com.badlogic.gdx.backends.lwjgl3)

<init>:166, Lwjgl3Application (com.badlogic.gdx.backends.lwjgl3)

main:16, DesktopLauncher (com.dsq2022.desktop)

Skipped breakpoint at com.dsq2022.game.Board:384 because it happened inside debugger evaluation

step into (a function that is called on the current line)

Executing tasks: [:desktop:DesktopLauncher.main] in project /home/george/... (moments ago) Gradle Build Running 384:1 LF UTF-8 4 spaces master

dsq2020 - Board.java [dsq2020.core.main]

File Edit View Navigate Code Refactor Build Run Tools Git Window Help

dsq2020 > core > src > main > java > com > dsq2022 > game > Board DesktopLauncher Pixel XL API 33 Git

Project android manifests java java (generated) assets jniLibs res res (generated) core main main.java.com.ds2022.game Base Board DSQ2022Game GameColor GetMove.java MainController MainView Piece PrefController

Board.java

```
380 s += gameOver + this.gameOver() + "\n";
381 s += "]\n";
382 s += "\nkey: rat is 1, cat is 2, dog is 3, wolf is 4, \n Leopard is 5, tiger is 6, lion is 7, elephant is 8\n";
383
384 return s; s: "[G G RT RD RT G G | |rLi . . . . rTi | \n[G G G RT G G G | | . ... View
385 }
386 //=====
387 /** Set the piece at the specified position (r,c).
388 * This function should NOT change the underlying Board pieces contents
389 * (e.g., cWater) at the specified location.
390 * @param r is the row
391 * @param c is the col
392 * @param p should/must be rbNone or rRat ... rElephant or bRat ...
393 * bElephant.
394 * @todo v2
395 */
396 public void setPiece ( int r, int c, Piece p ) {
397 //solution:
398 //bounds check
399 if ( r < 0 || c < 0 || r >= fRows || c >= fCols ) return;
400 this.piece[r][c] = p;
401 }
402 //=====
```

Debug: dsq2020.desktop [:desktop:DesktopLauncher.main] x

Debugger Console

Frames Variables Coroutines

"main"...UNNING ↑ ↓ ▼ + > this = {Board@1149} "[G G RT RD RT G G | |rLi rTi | \n[G G G RT G G G | | View > Coroutines

toString:384, Board (com.ds2022.game) s = "[G G RT RD RT G G | |rLi rTi | \n[G G G RT G G G | | . rDo . . . rCa . |... View

valueOf:2951, String (java.lang)

println:897, PrintStream (java.io)

init:43, DSQ2022Game (com.ds2022.game)

create:25, DSQ2022Game (com.ds2022.game)

addListener:416, Lwjgl3Window (com.ds2022.game)

update:366, Lwjgl3Window (com.ds2022.game)

loop:192, Lwjgl3Application (com.ds2022.game)

<init>:166, Lwjgl3Application (com.ds2022.game)

main:16, DesktopLauncher (com.ds2022.game)

resume execution (until we hit another breakpoint or the program ends)

Skipped breakpoint at com.ds2022.game.Board:384 because it happened inside debugger evaluation

Git Run Debug TODO Problems Terminal Logcat Build Profiler App Inspection Event Log Layout Inspector

Executing tasks: [:desktop:DesktopLauncher.main] in project /home/george/... (moments ago) Gradle Build Running 384:1 LF UTF-8 4 spaces master

dsq2020 - Board.java [dsq2020.core.main]

File Edit View Navigate Code Refactor Build Run Tools Git Window Help

dsq2020 > core > src > main > java > com > dsq2022 > game > Board DesktopLauncher Pixel XL API 33 Git

Project android > manifests > java > java (generated) > assets > jniLibs > res > res (generated) core > main > java > main.java.com.ds2022.game > Base > Board DSQ2022Game GameColor GetMove.java MainController MainView Piece PrefController

Board.java

```
380 s += gameOver + this.gameOver() + "\n";
381 s += "]\n";
382 s += "\nkey: rat is 1, cat is 2, dog is 3, wolf is 4, \n      Leopard is 5, tiger is 6, lion is 7, elephant is 8, \n";
383
384 return s; s: "[G G RT RD RT G G | |rLi . . . . rTi | \n[G G G RT G G G | |. ... View
385 }
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387 /** Set the piece at the specified position (r,c).
388  * This function should NOT change the underlying Board pieces contents
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391  * @param c is the col
392  * @param p should/must be rbNone or rRat ... rElephant or bRat ...
393  * @param bElephant.
394  * @todo v2
395  */
396 public void setPiece ( int r, int c, Piece p ) {
397     //solution:
398     //bounds check
399     if ( r < 0 || c < 0 || r >= fRows || c >= fCols ) return;
400     this.piece[r][c] = p;
401 }
402 //=====
```

Debug: dsq2020.desktop [:desktop:DesktopLauncher.mai...]

Debugger Console Variables Coroutines

Frames "main"...UNNING > > this = {Board@1149} "[G G RT RD RT G G | |rLi rTi | \n[G G G RT G G G | |. ... View > Coroutines

toString:384, Board (com.ds2022.game) s = "[G G RT RD RT G G | |rLi rTi | \n[G G G RT G G G | |. rDo . . . rCa . |... View

valueOf:2951, String (java.lang)

println:897, PrintStream (java.io)

init:43, DSQ2022Game (com.ds2022.game)

create:25, DSQ2022Game (com.ds2022.game)

addListener:416, Lwjgl3Window (com.ds2022.game)

update:366, Lwjgl3Window (com.ds2022.game)

loop:192, Lwjgl3Application (com.ds2022.game)

<init>:166, Lwjgl3Application (com.ds2022.game)

main:16, DesktopLauncher (com.ds2022.game)

Skipped breakpoint at com.ds2022.game.Board:384 because it happened inside debugger evaluation

terminate the program/end our debugging session

Executing tasks: [:desktop:DesktopLauncher.main()] in project /home/george/... (moments ago) Gradle Build Running 384:1 LF UTF-8 4 spaces master

dsq2020 - Board.java [dsq2020.core.main]

File Edit View Navigate Code Refactor Build Run Tools Git Window Help

dsq2020 > core > src > main > java > com > dsq2022 > game > Board DesktopLauncher Pixel XL API 33 Git

Project android manifests java java (generated) assets jniLibs res res (generated) core main main.java.com.ds2022.game Base Board DSQ2022Game GameColor GetMove.java MainController MainView Piece PrefController

```
380 s += gameOver() + this.gameOver() + "\n";
381 s += "]\n";
382 s += "\nkey: rat is 1, cat is 2, dog is 3, wolf is 4, \n      Leopard is 5, tiger is 6, lion is 7, elephant is 8\n";
383
384 return s; s: "[G G RT RD RT G G | |rLi . . . . rTi | \n[G G G RT G G G | |. ... View
385 }
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387 /** Set the piece at the specified position (r,c).
388  * This function should NOT change the underlying Board pieces contents
389  * (e.g., cWater) at the specified location.
390  * @param r is the row
391  * @param c is the col
392  * @param p should/must be rbNone or rRat ... rElephant or bRat ...
393  * bElephant.
394  * @todo v2
395  */
396 public void setPiece ( int r, int c, Piece p ) {
397     //solution:
398     //bounds check
399     if ( r < 0 || c < 0 || r >= fRows || c >= fCols ) return;
400     this.piece[r][c] = p;
401 }
402 //=====
```

Debug: dsq2020.desktop [:desktop:DesktopLauncher.mai...]

Debugger Console Variables Coroutines

Frames Variables Coroutines

✓ "main"...UNNING ↑ ↓ ▼ + > this = {Board@1149} "[G G RT RD RT G G | |rLi rTi | \n[G G G RT G G G | |. ... View > Coroutines

toString:384, Board (com.ds2022.game) s = "[G G RT RD RT G G | |rLi rTi | \n[G G G RT G G G | |. rDo . . . rCa . |... View

valueOf:2951, String (java.lang)

println:897, PrintStream (java.io)

init:43, DSQ2022Game (com.ds2022)

create:25, DSQ2022Game (com.ds2022)

addListener:416, Lwjgl3Window (com.ds2022)

update:366, Lwjgl3Window (com.ds2022)

loop:192, Lwjgl3Application (com.ds2022)

<init>:166, Lwjgl3Application (com.ds2022)

main:16, DesktopLauncher (com.ds2022)

Skipped breakpoint at com.ds2022.game.Board:384 because it happened inside debugger evaluation

Executing tasks: [:desktop:DesktopLauncher.main()] in project /home/george/... (moments ago) Gradle Build Running 384:1 LF UTF-8 4 spaces master

Event Log Layout Inspector

Device Manager Device File Explorer Emulator

We can inspect the values of variables as our program runs.

dsq2020 - Board.java [dsq2020.core.main]

File Edit View Navigate Code Refactor Build Run Tools Git Window Help

dsq2020 > core > src > main > java > com > dsq2022 > game > Board DesktopLauncher Pixel XL API 33 Git

Project android manifests java java (generated) assets jniLibs res res (generated) core main main.java.com.ds2022.game Base Board DSQ2022Game GameColor GetMove.java MainController MainView Piece PrefController

Board.java

```
380 s += gameOver() + this.gameOver() + "\n";
381 s += "]\n";
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383
384 return s; s: "[G G RT RD RT G G | |rLi . . . . rTi | \n[G G G RT G G G | |. ... View
385 }
386 //=====
387 /** Set the piece at the specified position (r,c).
388  * This function should NOT change the underlying Board pieces contents
389  * (e.g., cWater) at the specified location.
390  * @param r is the row
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392  * @param p should/must be rbNone or rRat ... rElephant or bRat ...
393  * bElephant.
394  * @todo v2
395  */
396 public void setPiece ( int r, int c, Piece p ) {
397     //solution:
398     //bounds check
399     if ( r < 0 || c < 0 || r >= fRows || c >= fCols ) return;
400     this.piece[r][c] = p;
401 }
402 //=====
```

Debug: dsq2020.desktop [:desktop:DesktopLauncher.mai... x

Debugger Console

Frames Variables Coroutines

"main"...UNNING ↑ ↓ ▼ + > this = {Board@1149} "[G G RT RD RT G G | |rLi rTi | \n[G G G RT G G G | |. ... View > Coroutines

toString:384, Board (com.ds2022.game) s = "[G G RT RD RT G G | |rLi rTi | \n[G G G RT G G G | |. rDo . . . rCa . |... View

valueOf:2951, String (java.lang)

println:897, PrintStream (java.io)

init:43, DSQ2022Game (com.ds2022.game)

create:25, DSQ2022Game (com.ds2022.game)

addListener:416, Lwjgl3Window (com.ds2022.game)

update:366, Lwjgl3Window (com.ds2022.game)

loop:192, Lwjgl3Application (com.ds2022.game)

<init>:166, Lwjgl3Application (com.ds2022.game)

main:16, DesktopLauncher (com.ds2022.game)

Skipped breakpoint at com.ds2022.game.Board:384 because it happened inside debugger evaluation

We can inspect the values of variables as our program runs. "Mousing over" variables in our source code works too!

Device Manager Device File Explorer Emulator

Event Log Layout Inspector

Executing tasks: [:desktop:DesktopLauncher.main()] in project /home/george/... (moments ago) Gradle Build Running 384:1 LF UTF-8 4 spaces master

dsq2020 - Board.java [dsq2020.core.main]

File Edit View Navigate Code Refactor Build Run Tools Git Window Help

dsq2020 > core > src > main > java > com > dsq2022 > game > Board DesktopLauncher Pixel XL API 33 Git

Project android > manifests > java > java (generated) > assets > jniLibs > res > res (generated) core > main > main.java.com.dsq2022.game > Base > Board DSQ2022Game GameColor GetMove.java MainController MainView Piece PrefController

Board.java

```
380 s += gameOver + this.gameOver() + "\n";
381 s += "]\n";
382 s += "\nkey: rat is 1, cat is 2, dog is 3, wolf is 4, \n      Leopard is 5, tiger is 6, lion is 7, elephant is 8\n";
383
384 return s; s: "[G G RT RD RT G G | |rLi . . . . rTi | \n[G G G RT G G G | |. ... View
385 }
386 //=====
387 /** Set the piece at the specified position (r,c).
388  * This function should NOT change the underlying Board pieces contents
389  * (e.g., cWater) at the specified location.
390  * @param r is the row
391  * @param c is the col
392  * @param p should/must be rbNone or rRat ... rElephant or bRat ...
393  * bElephant.
394  * @todo v2
395  */
396 public void setPiece ( int r, int c, Piece p ) {
397     //solution:
398     //bounds check
399     if ( r < 0 || c < 0 || r >= fRows || c >= fCols ) return;
400     this.piece[r][c] = p;
401 }
402 //=====
```

Debug: dsq2020.desktop [:desktop:DesktopLauncher.mai...]

Debugger Console Variables Coroutines

Frames Variables Coroutines

✓ "main"...UNNING ↑ ↓ ▼ + > this = {Board@1149} "[G G RT RD RT G G | |rLi rTi | \n[G G G RT G G G | |. ... View > Coroutines

toString:384, Board (com.dsq2022.game) s = "[G G RT RD RT G G | |rLi rTi | \n[G G G RT G G G | |. rDo . . . rCa . |... View

valueOf:2951, String (java.lang)

println:897, PrintStream (java.io)

init:43, DSQ2022Game (com.dsq2022.game)

create:25, DSQ2022Game (com.dsq2022.game)

addListener:416, Lwjgl3Window (com.badlogic.gdx.backends.lwjgl3)

update:366, Lwjgl3Window (com.badlogic.gdx.backends.lwjgl3)

loop:192, Lwjgl3Application (com.badlogic.gdx.backends.lwjgl3)

<init>:166, Lwjgl3Application (com.badlogic.gdx.backends.lwjgl3)

main:16, DesktopLauncher (com.dsq2022.desktop)

Skipped breakpoint at com.dsq2022.game.Board:384 because it happened inside debugger evaluation

and many more advanced features

Executing tasks: [:desktop:DesktopLauncher.main()] in project /home/george/... (moments ago) Gradle Build Running 384:1 LF UTF-8 4 spaces master