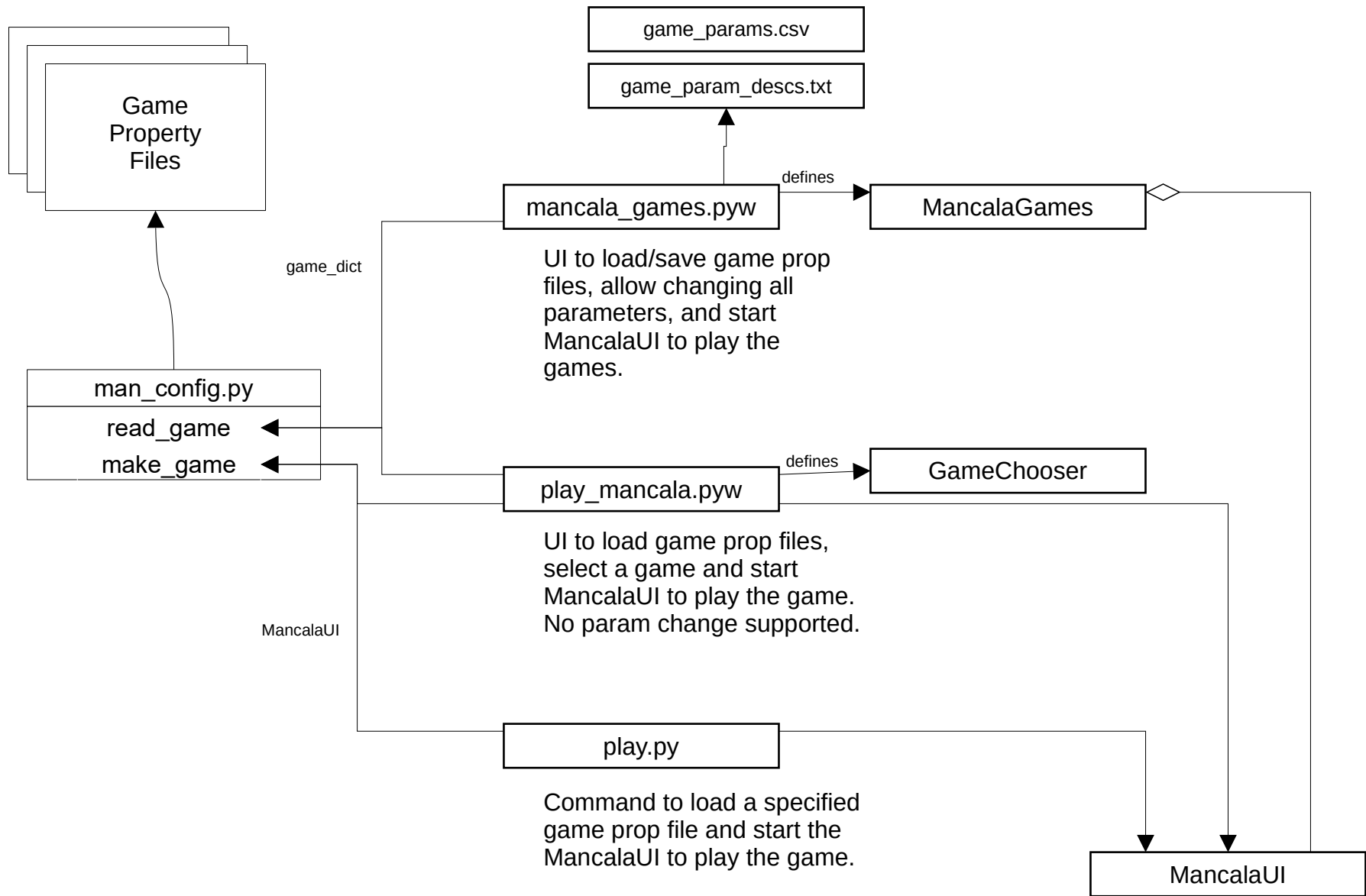
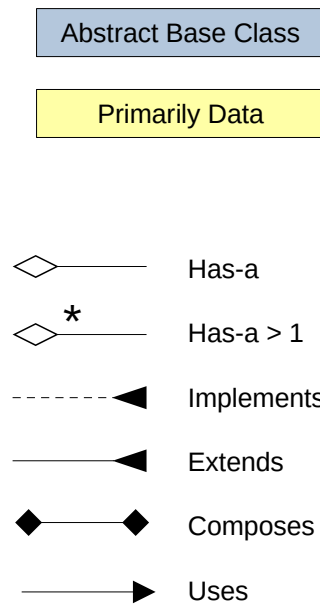


Mancala Games



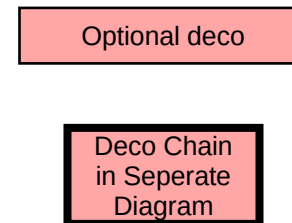
Notation Conventions

Class Diagram Conventions



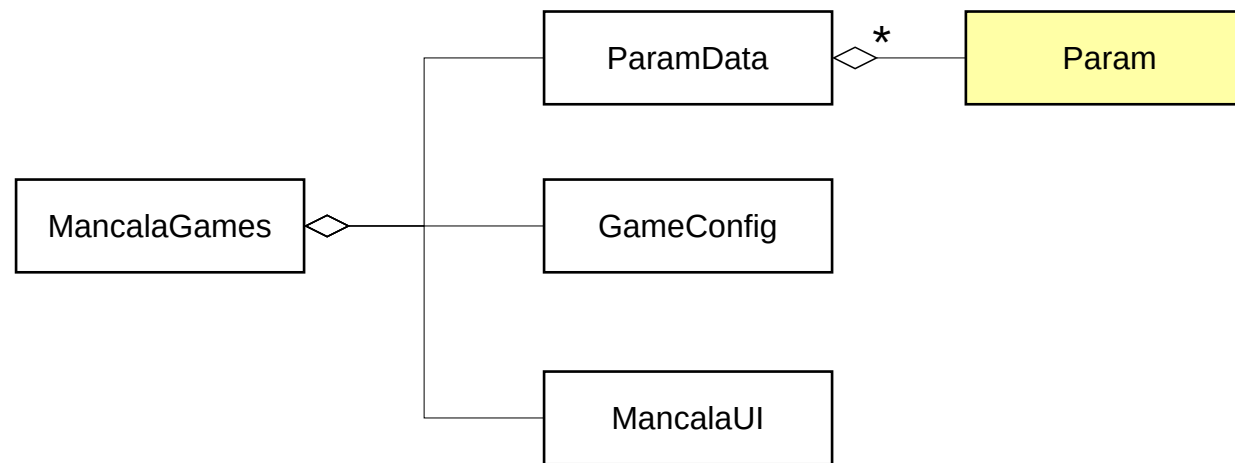
Deco Chain Conventions

- One path down the deco chain is used.
- Intersecting arrows are decision points.
- Shown in **call order** from start dot (constructed in reverse order).
- Calls down the deco chain maybe at any point in each deco's processing.
- Some deco's do not call down the deco chain even if there is a follow-on deco.
- All paths shown might not be possible (see ginfo_rules).



MancalaGames

(the Mancala Games UI class)

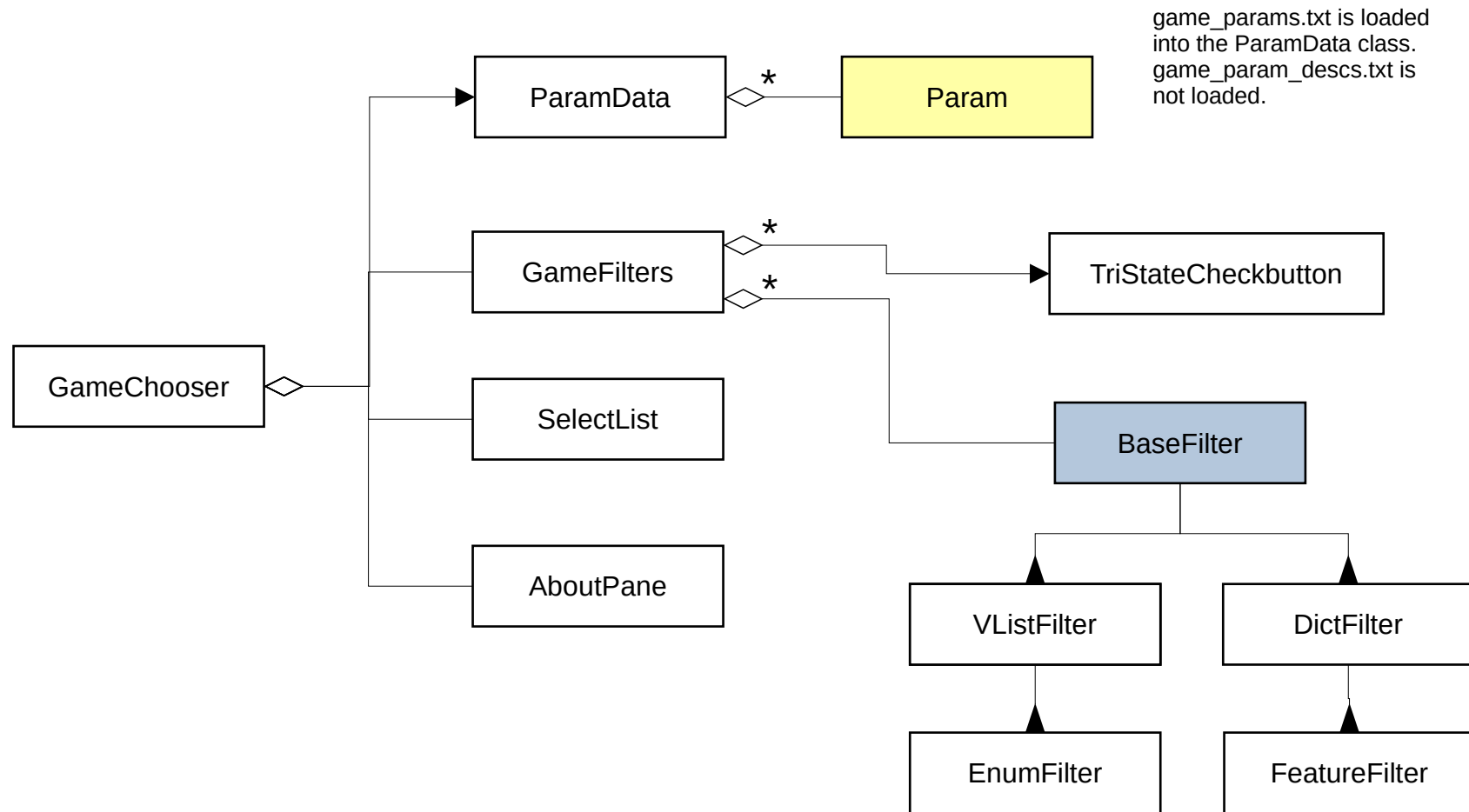


game_params.txt and game_param_descs.txt are loaded into the ParamData class.

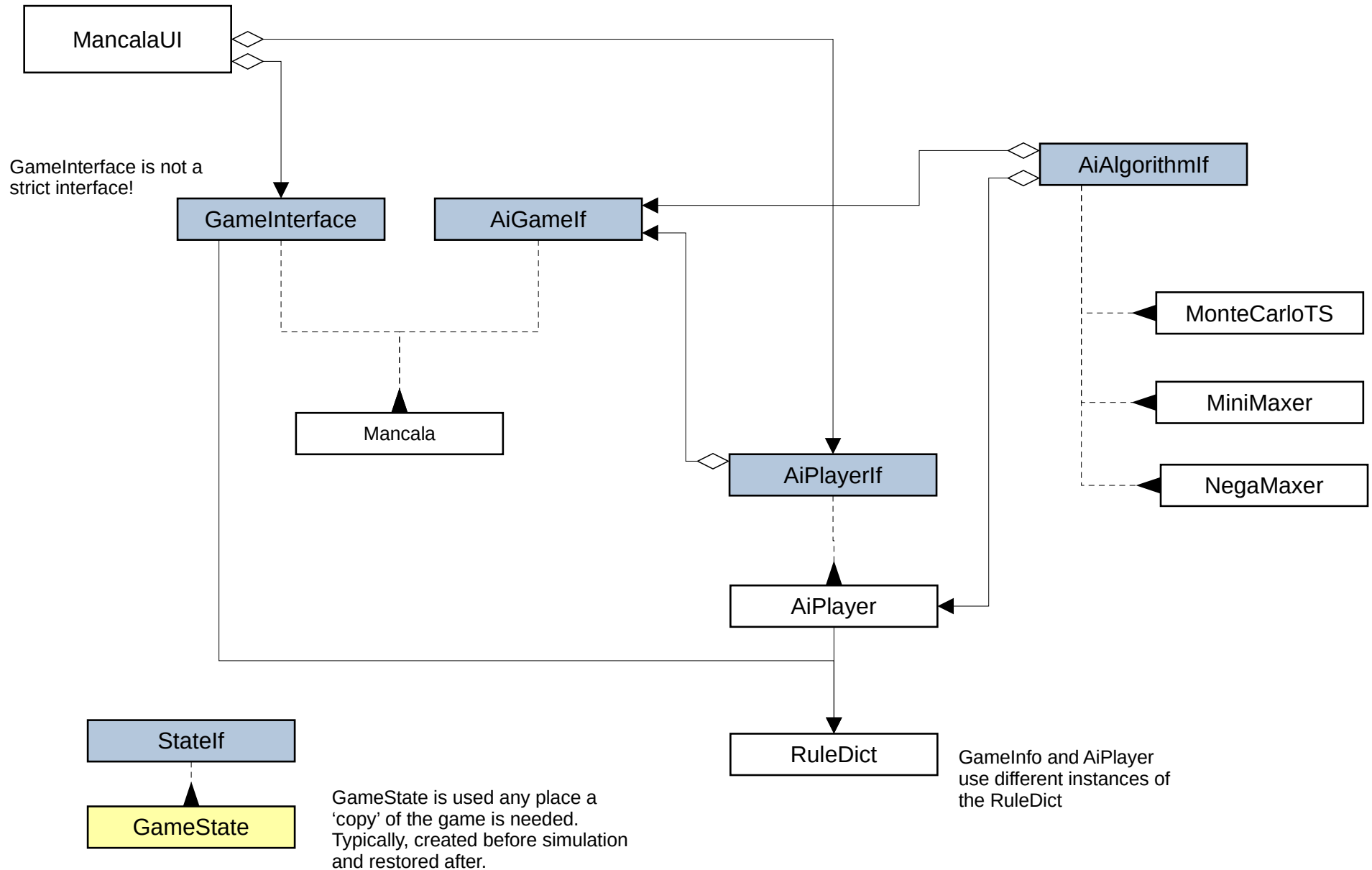
Management of the game configuration file is done with the GameConfig class in MancalaUI

GameChooser

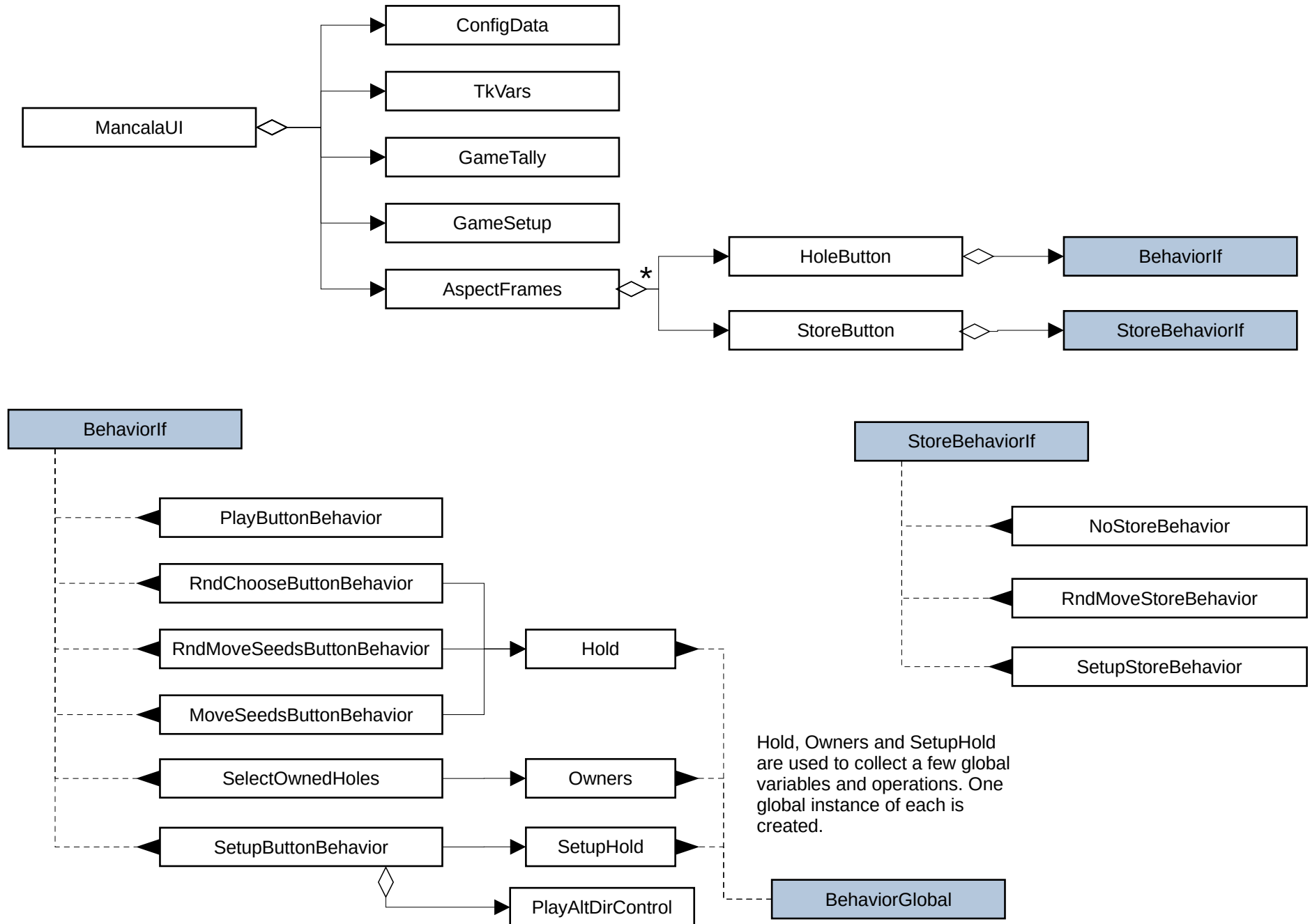
(the Play Mancala UI class)



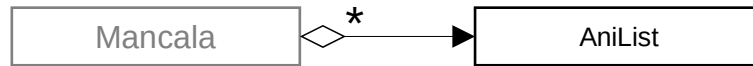
Mancala, GameState, AIPlayer and AIAlgorithm



Mancala UI Classes



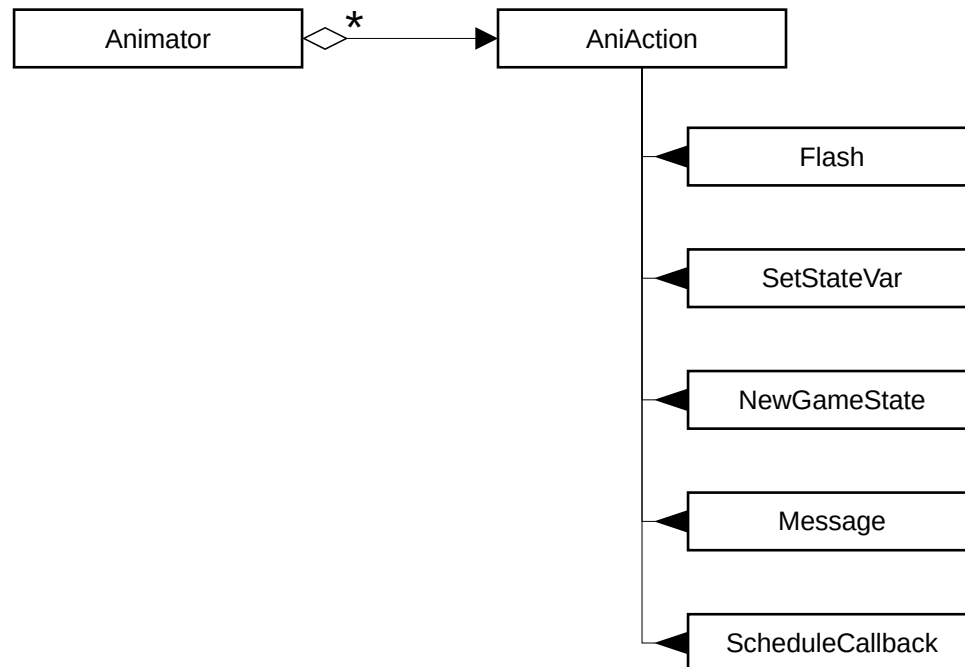
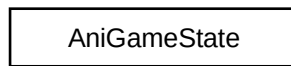
Animator Classes



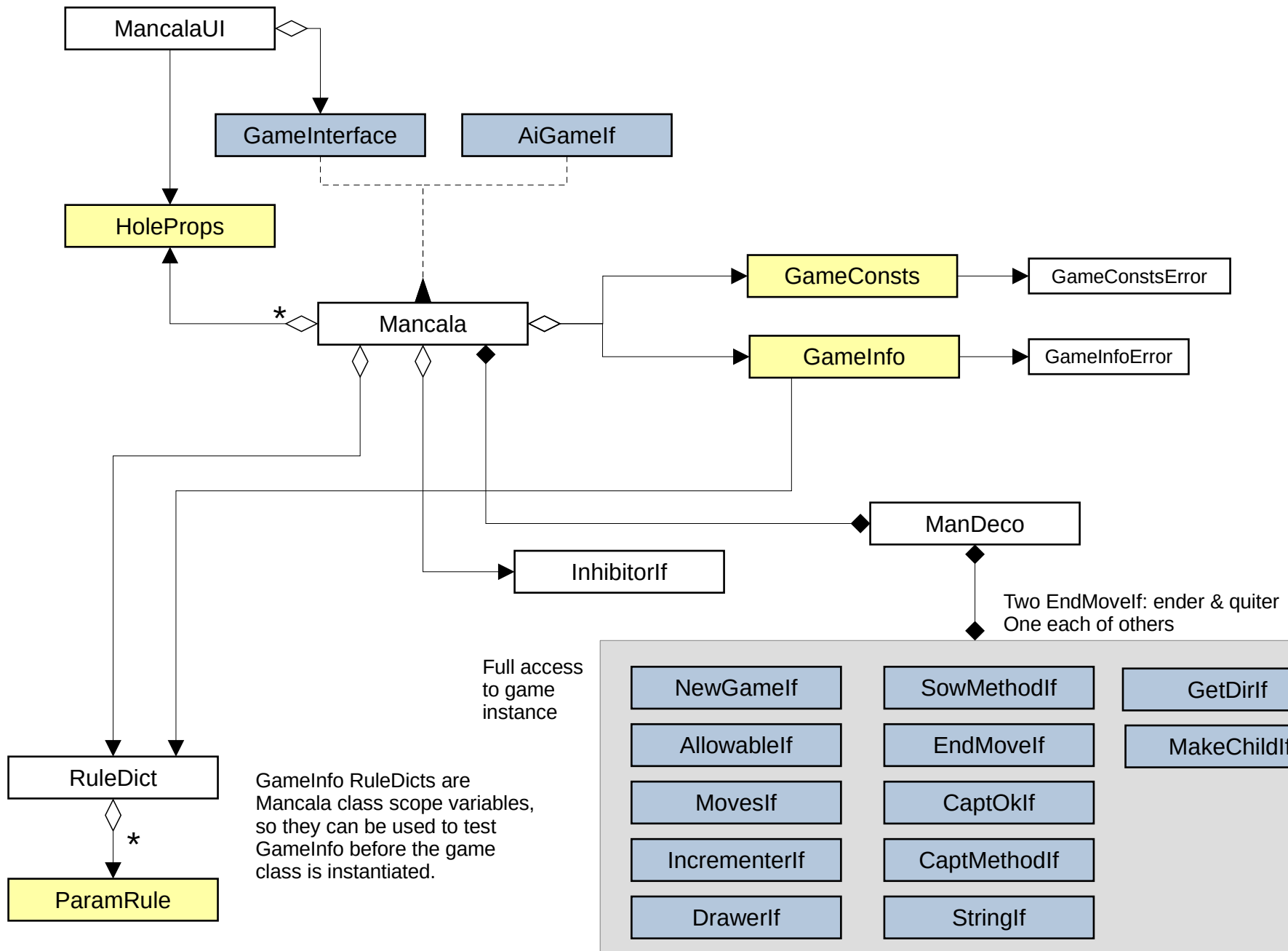
Assignments to an AniList generate SetStateVar animations.

These animator hooks are used for 5 state variable and only when they are configured for use in a game.

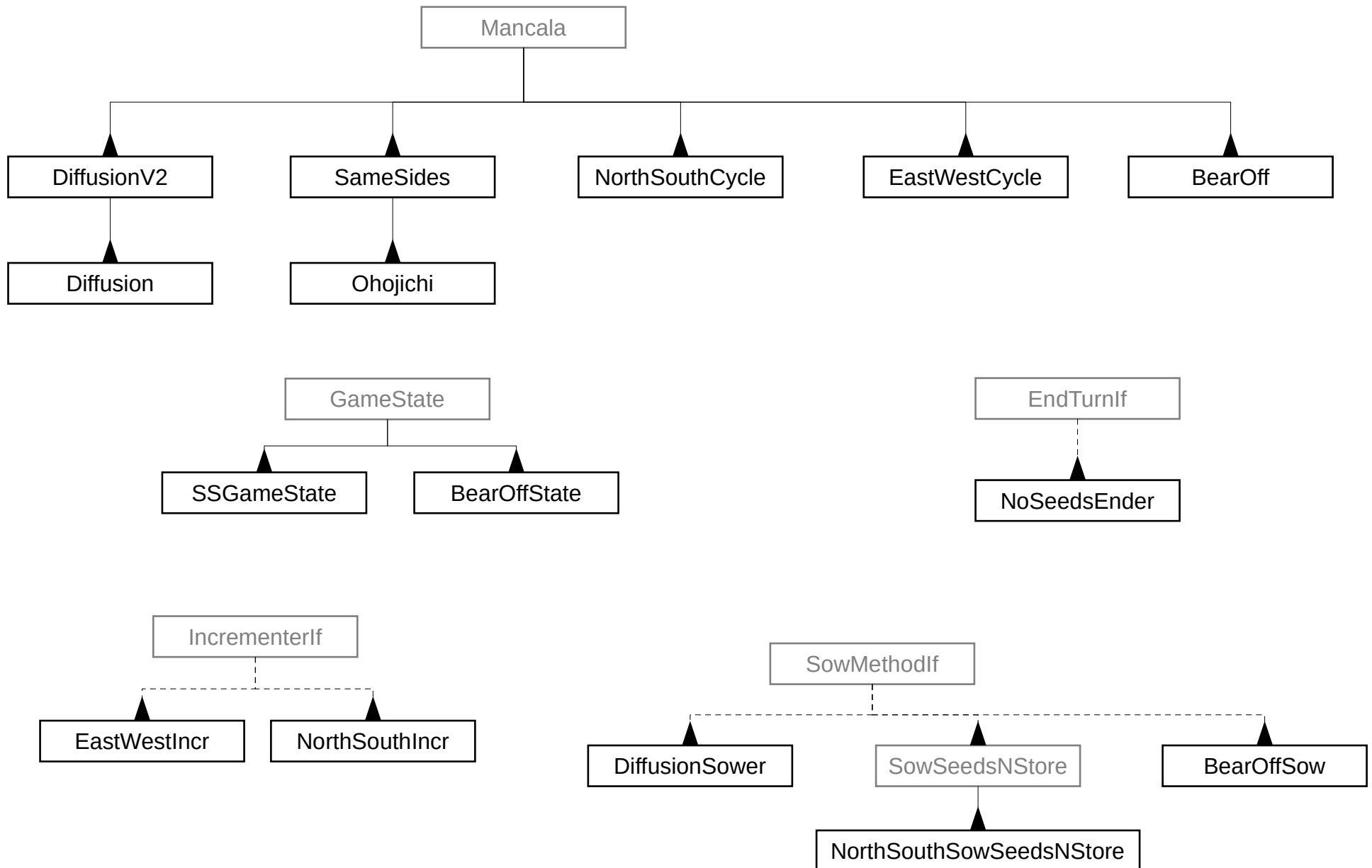
These hooks are not included if animator.ENABLED is set False.



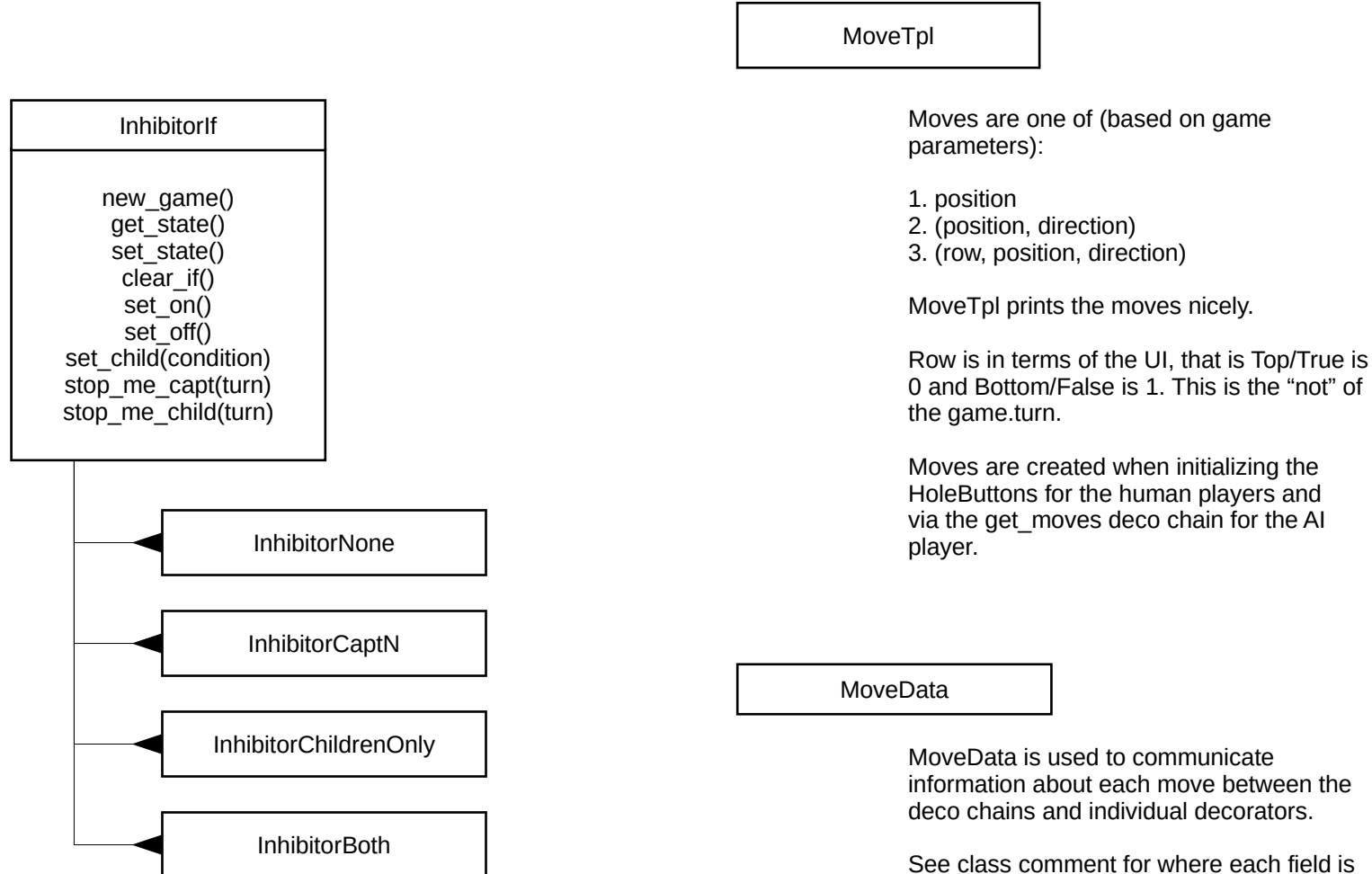
Mancala Classes



Additional Game Classes and Supporting Decorators



Import Classes for Moves

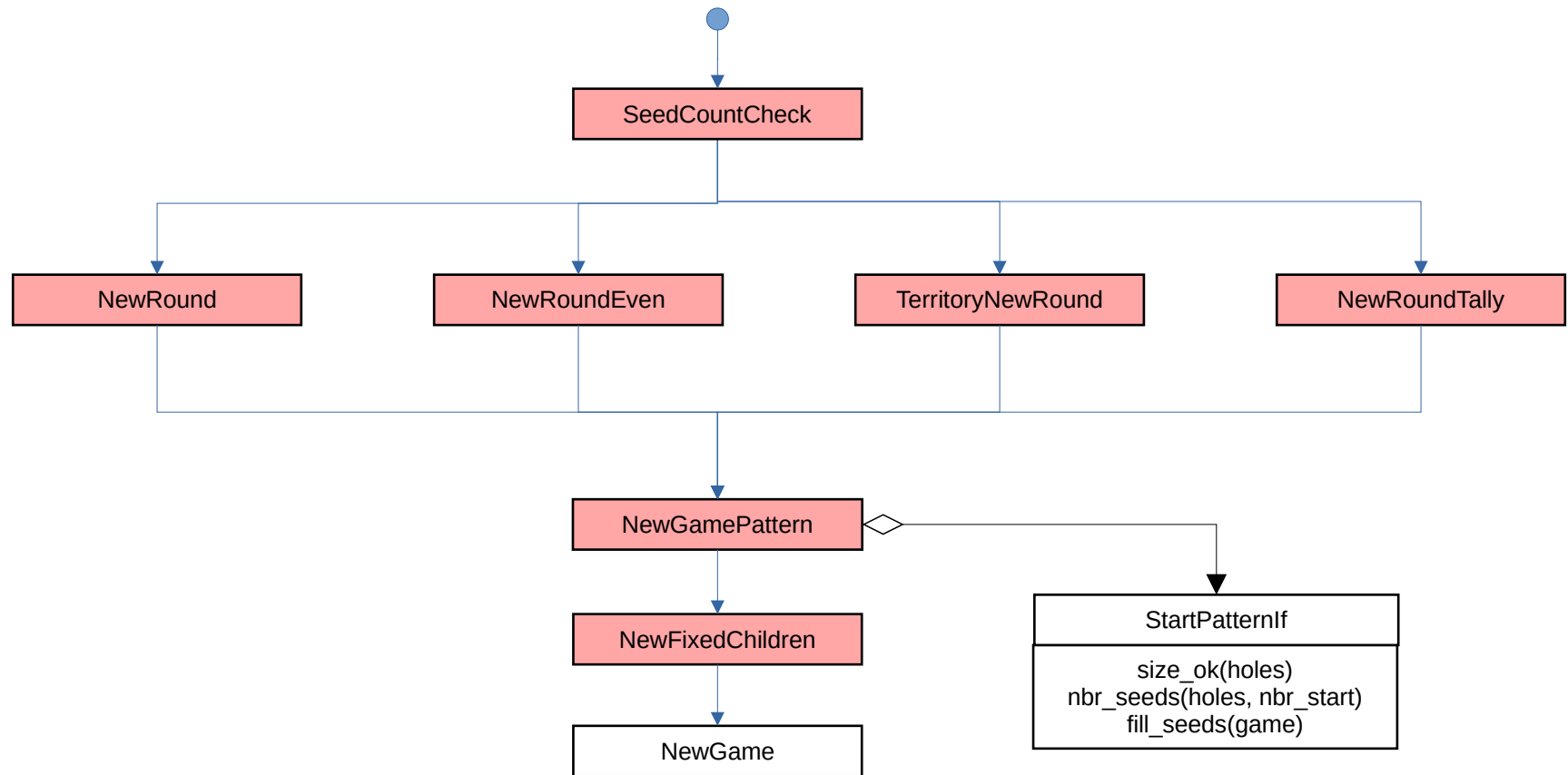


The decorator chains and button behaviors use and control the inhibitor.

Decorator Usage

| Game Op/Step | Primary Decorator | Other Classes & Decorators Used | Description |
|----------------------------|--------------------|---------------------------------------|--|
| New Game | new_game | StartPattern, inhibitor | Setups the game for initial play. Applies any prescribed moves. |
| Determine Drawable Holes | allow | | Return a list of holes that are playable. |
| Collect Moves | get_moves | | Return a list of possible moves. |
| Draw seeds to start a move | drawer | | Parse the move, determine number of seeds to sow, possibly leave one seed |
| Determine sow direction | get_direction | | Convert the move & location into an actual sowable direction: clockwise or counter-clockwise. |
| Sow | sower | MoveData, incr, make_child, inhibitor | Drop the seeds into the board holes. |
| Capture seeds | capturer & capt_ok | MoveData, incr, make_child, inhibitor | Perform any captures. |
| Evaluate end of game | ender | MoveData | At the end of each move determine if the game is over: game has been won, no more moves, game outcome can't change, etc. |
| Logging | get_string | | Creates an ASCII string for the game. |
| Force end of game | quitter | | The game needs to end either because of endless sow or user selection. Something fair will be done. |

New Game Decorators and Chain



State variables changed:

blocked
board
owner
starter
store
turn

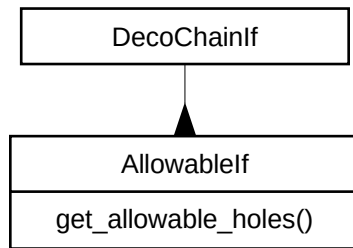
Parameters:

blocks
goal
min_move
round_starter
round_fill
rounds
start_pattern

DecoChainIf

NewGameIf
new_game(wind_cond, new_round_ok)

Allowables Decorators and Chain

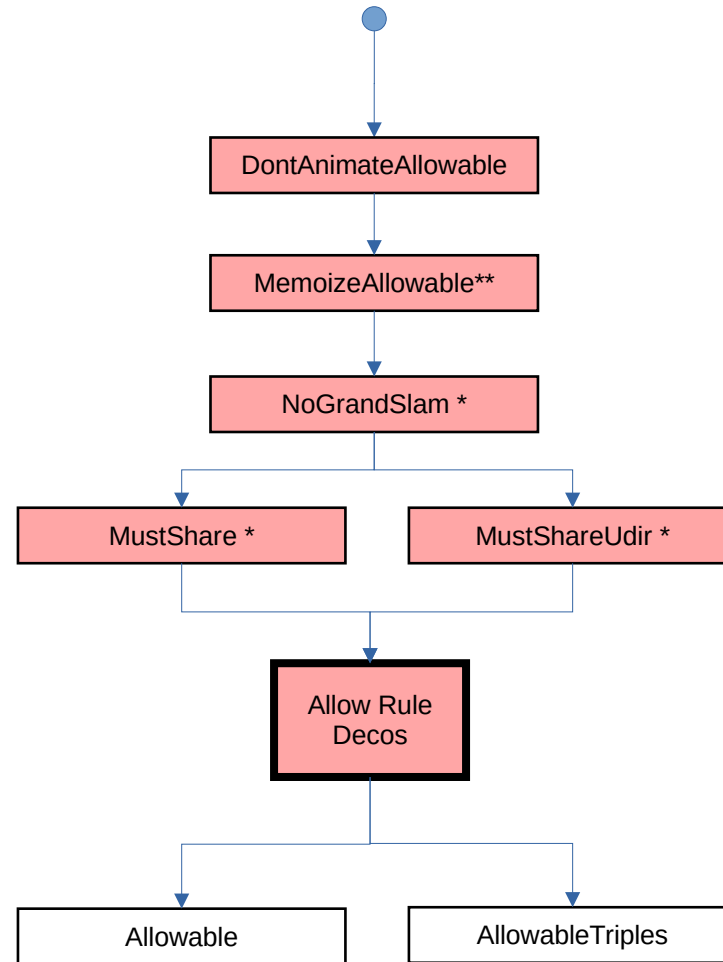


State variables read:

turn
board
store
blocked
owner
child
mcount

Parameters:

min_move
allow_rule
mlength
mustshare
grandslam
udir_holes

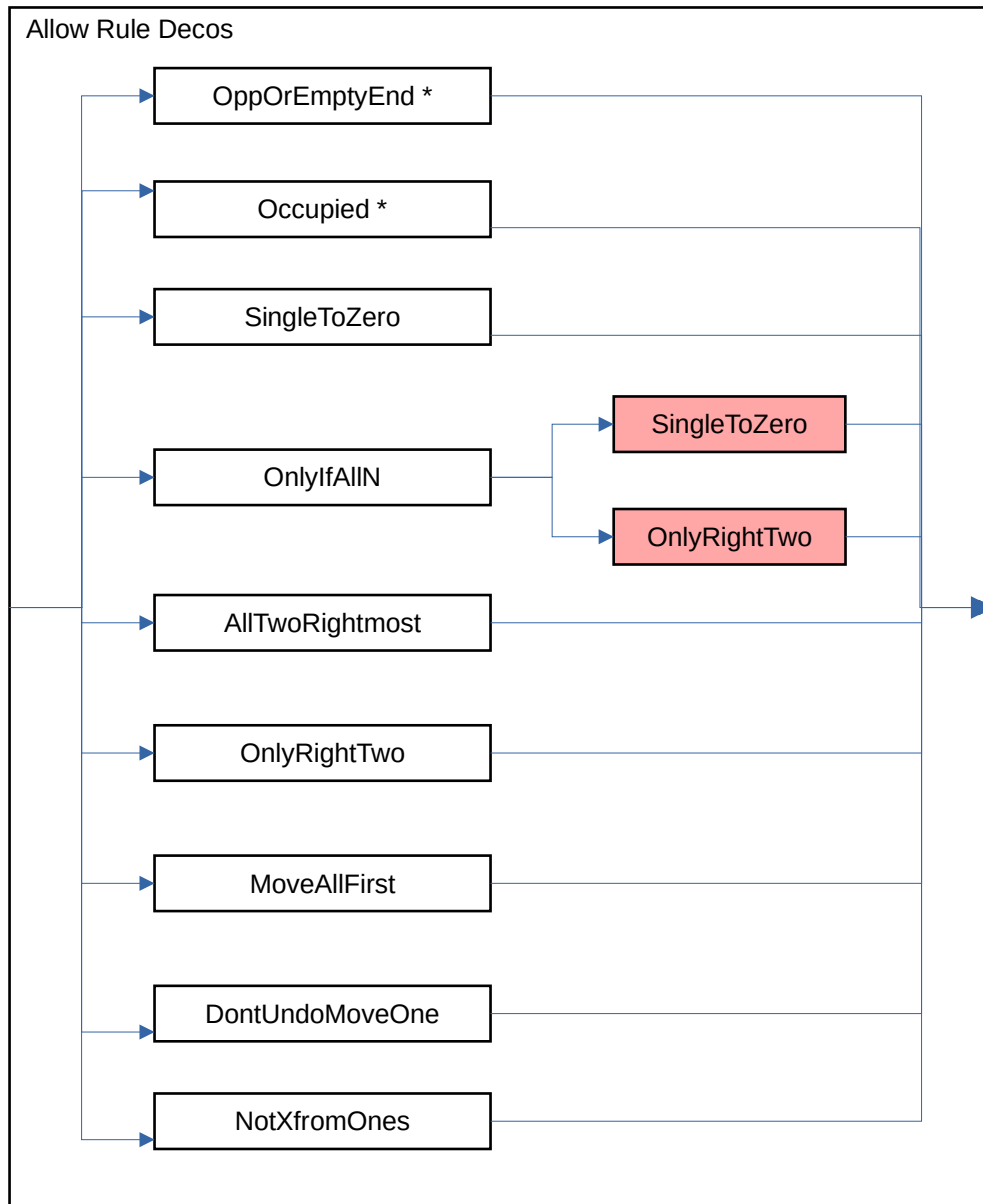


Notes:

* Simulates some portion of moves to determine allowables

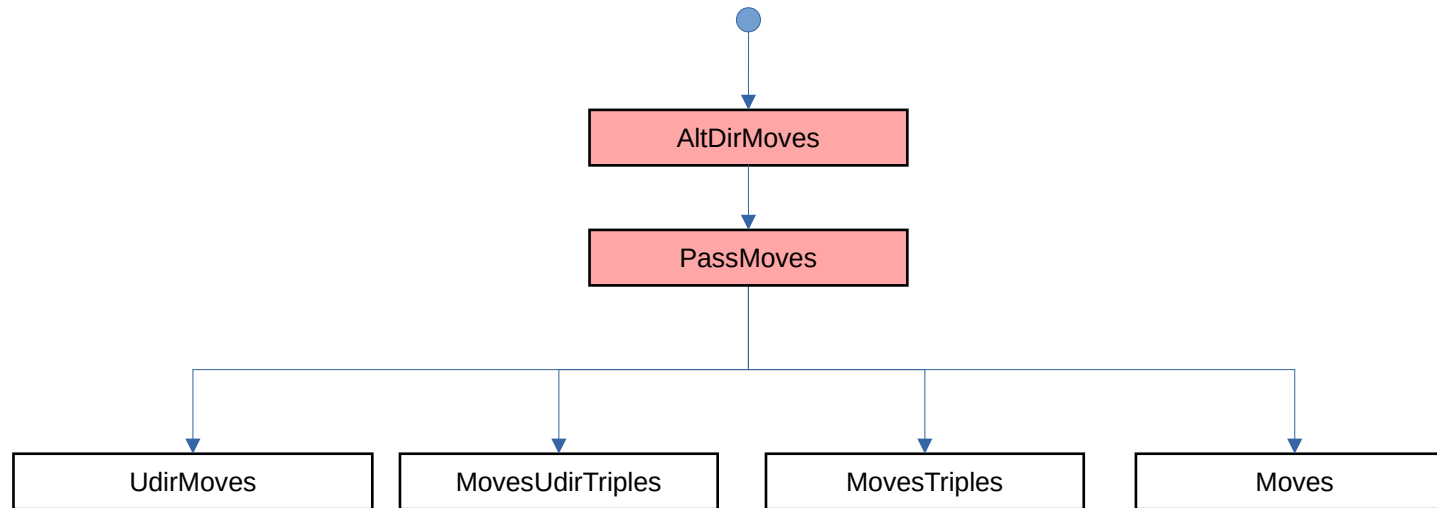
** MemoizeAllowable is used for deco's that simulate moves

Allow Rule Decos



Notes:
Some allow rule decos are shown more than once for clarity.
* Simulates some portion of moves to determine allowables

Get Moves Decorators and Chain

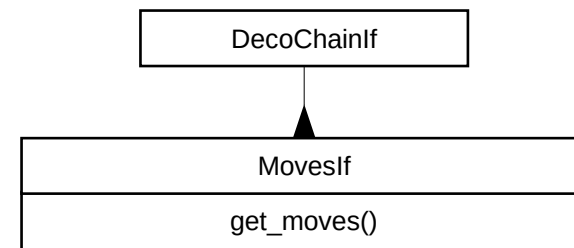


State variables read:

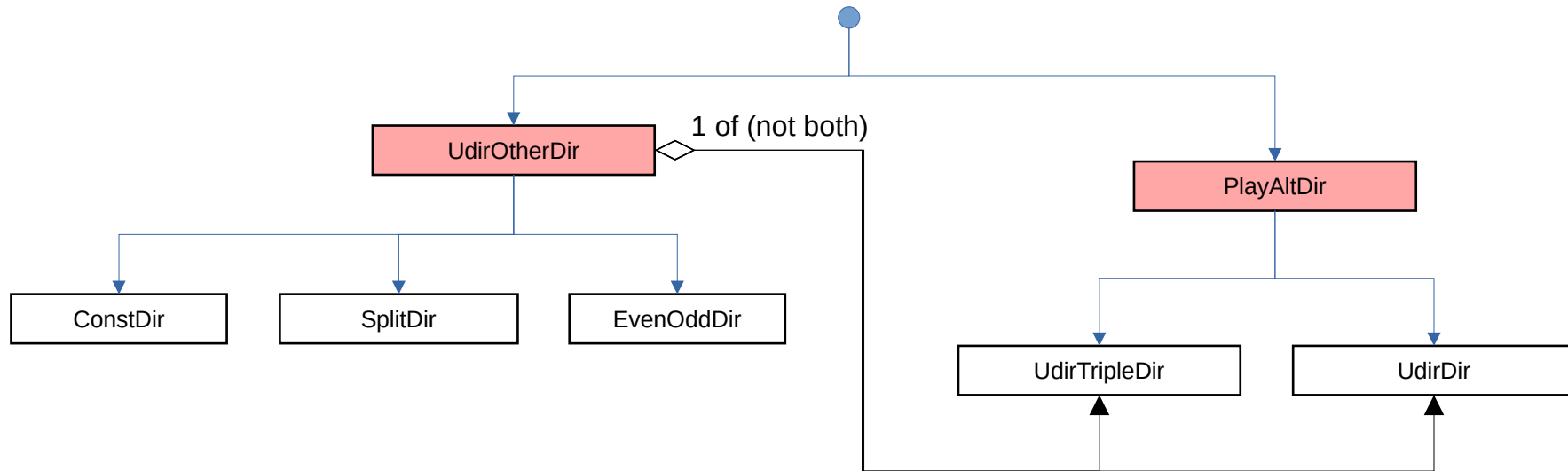
blocked
board
owner
starter
store
turn

Parameters:

mlength
mustpass
sow_direct
udir_holes
udirect

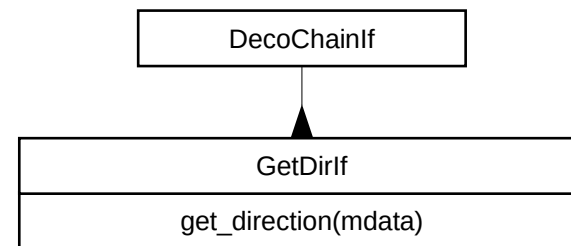


Get Direction Decorators and Chain

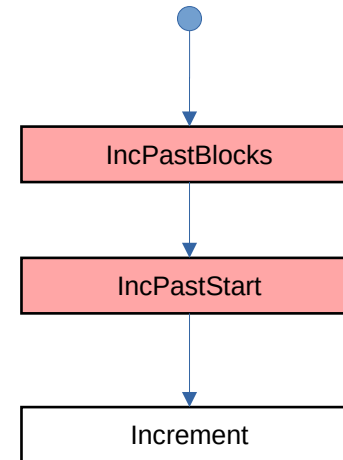
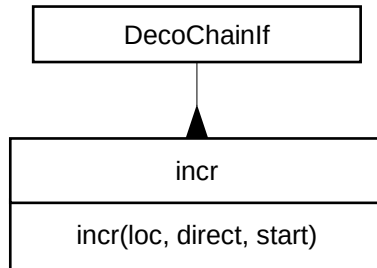


State variables read:
mcount
turn

Parameters:
no_sides
sow_direct
udir_holes
udirect



Incrementer Decorators and Chains



State variables read:
blocked

Parameters:
blocks
skip_start

MakeChild Decorator and Chain

State variables read:

board
child
inhibitor
owner
turn

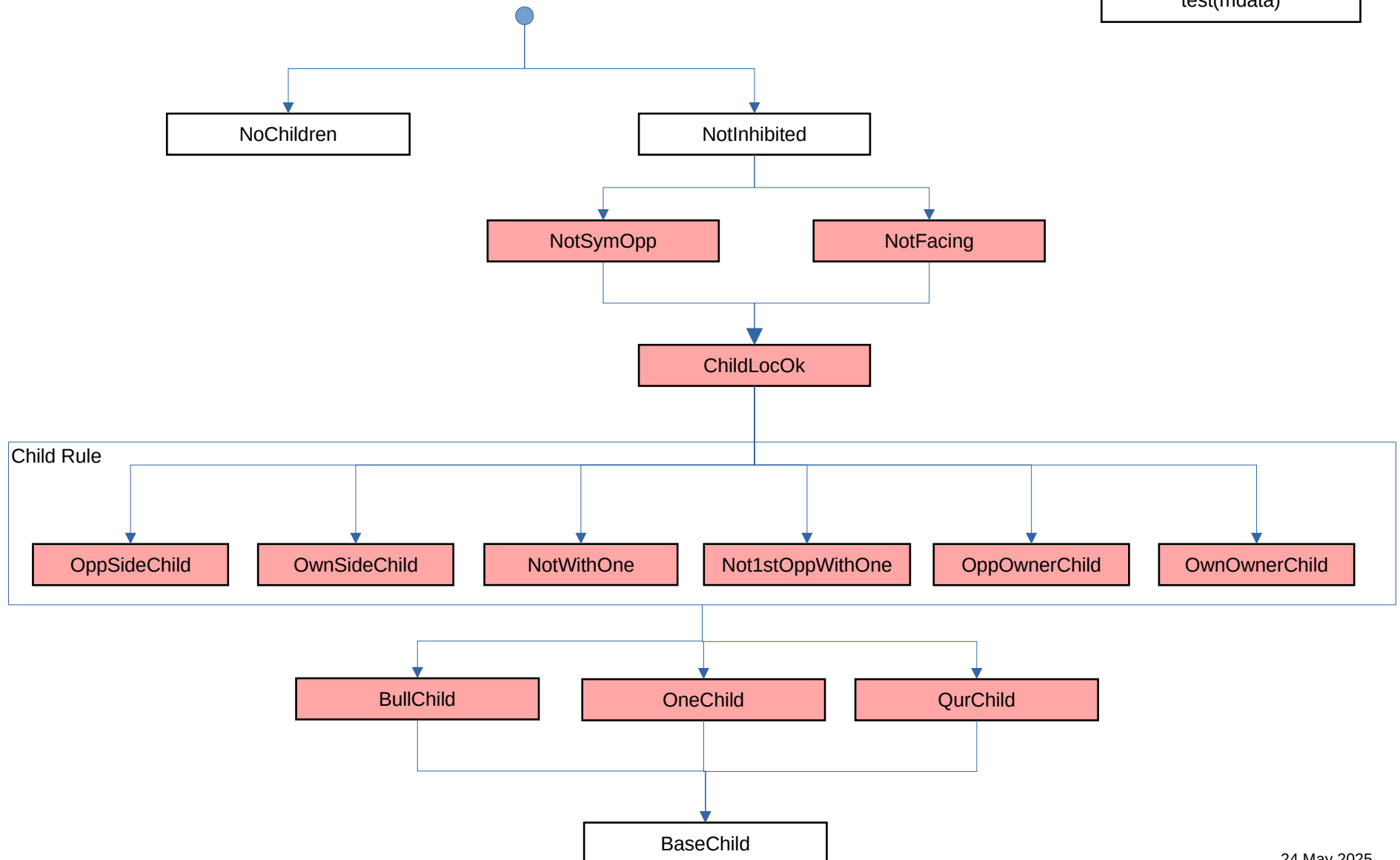
Parameters:

child_cvt
child_locs
child_rule
child_type

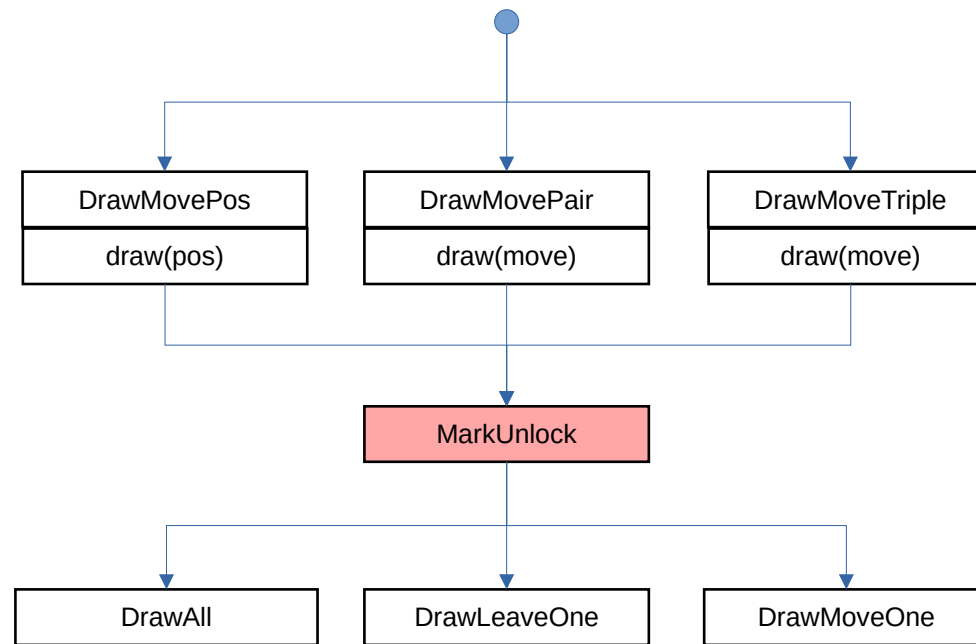
DecoChainIf

MakeChildIf

test(mdata)



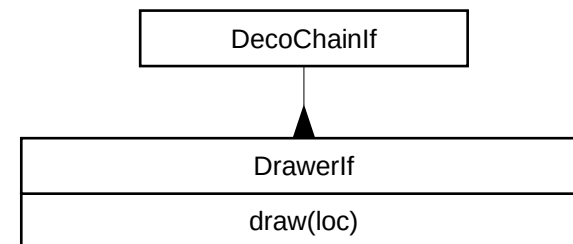
Draw Decorators and Chain



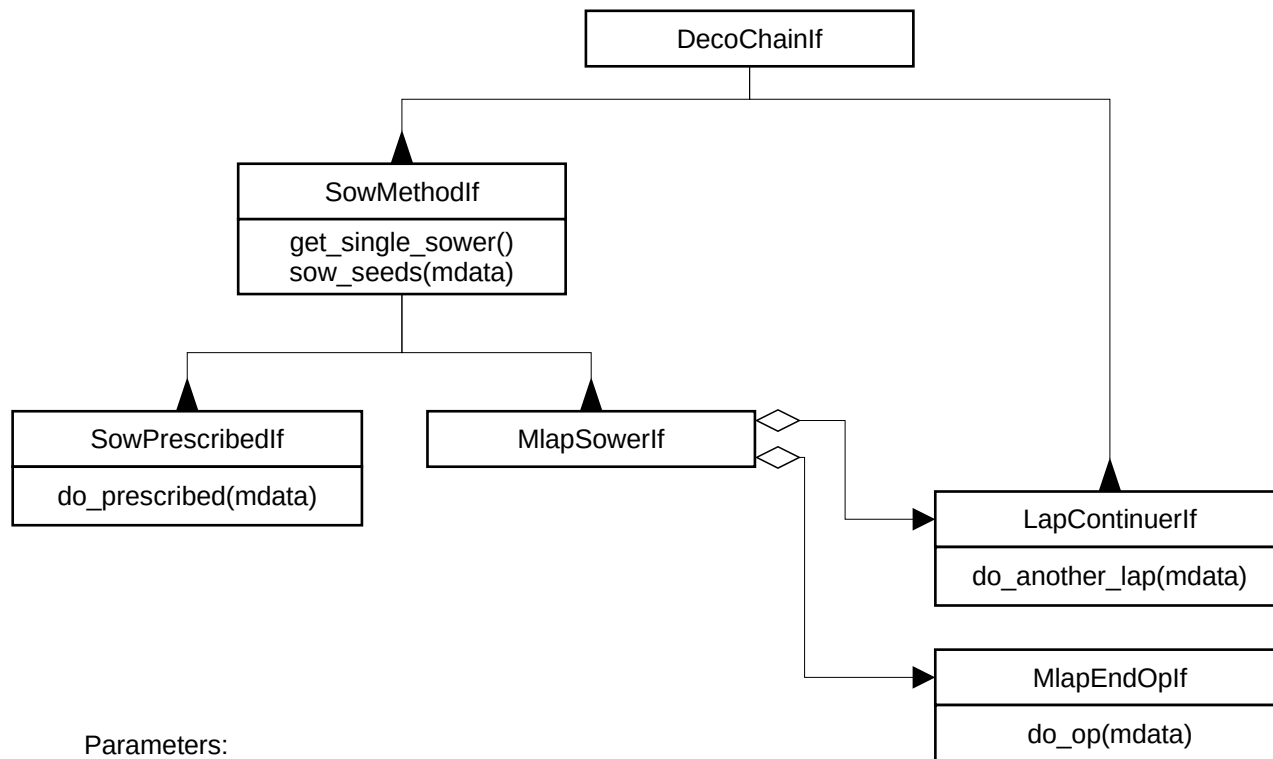
The first drawer converts the move into board location.

State variables:
Read:
 turn
Changed:
 board
 unlocked

Parameters:
 allow_rule
 mlength
 move_one
 moveunlock
 sow_start



Sower Decorators

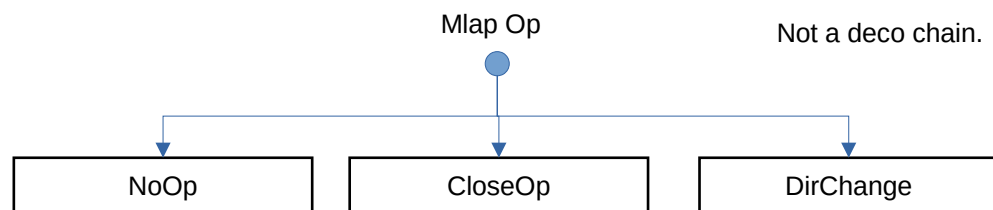


State variables:

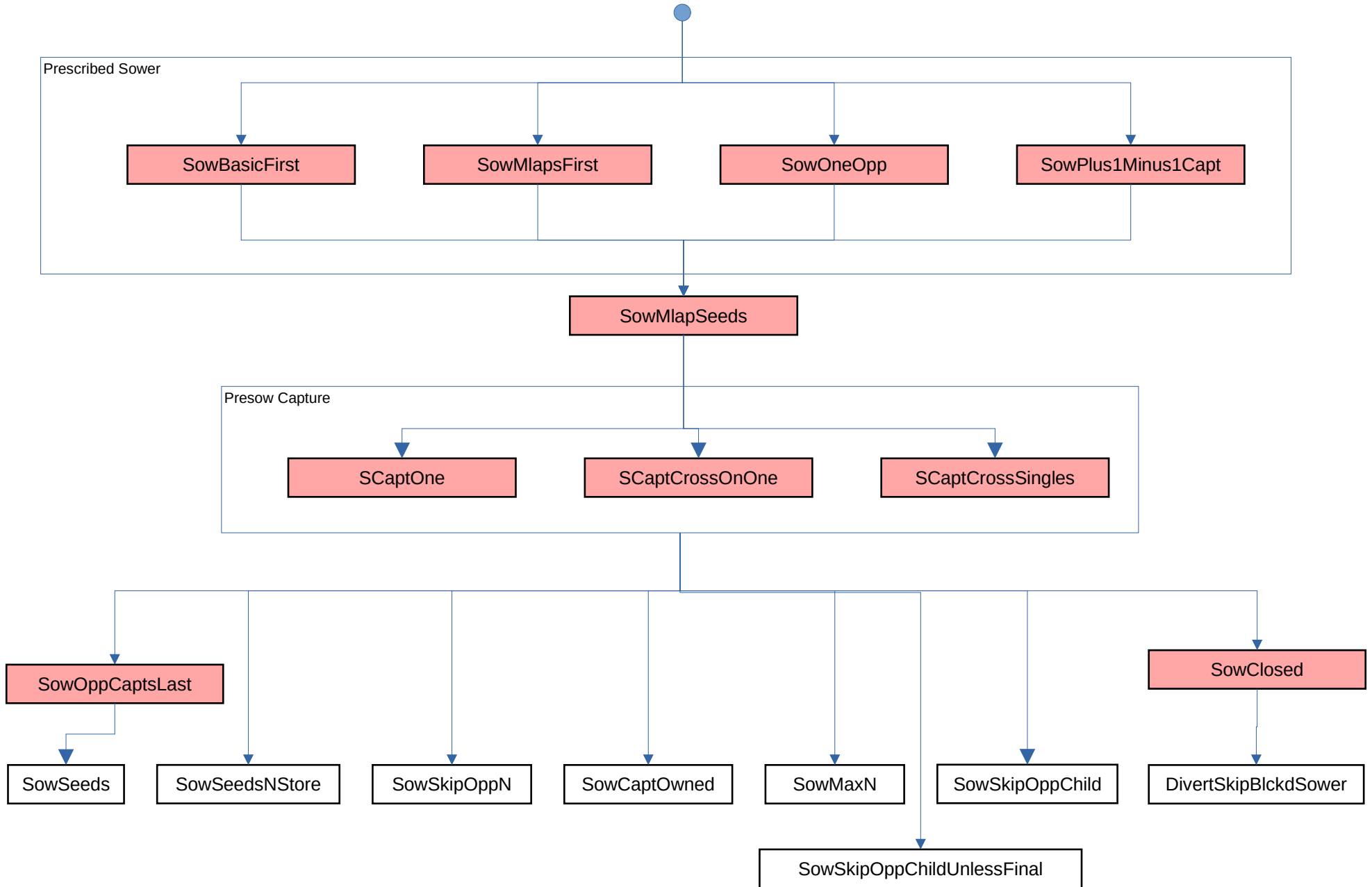
Reads
inhibitor
turn
child
mcount
Changes
board
store
blocked

Parameters:

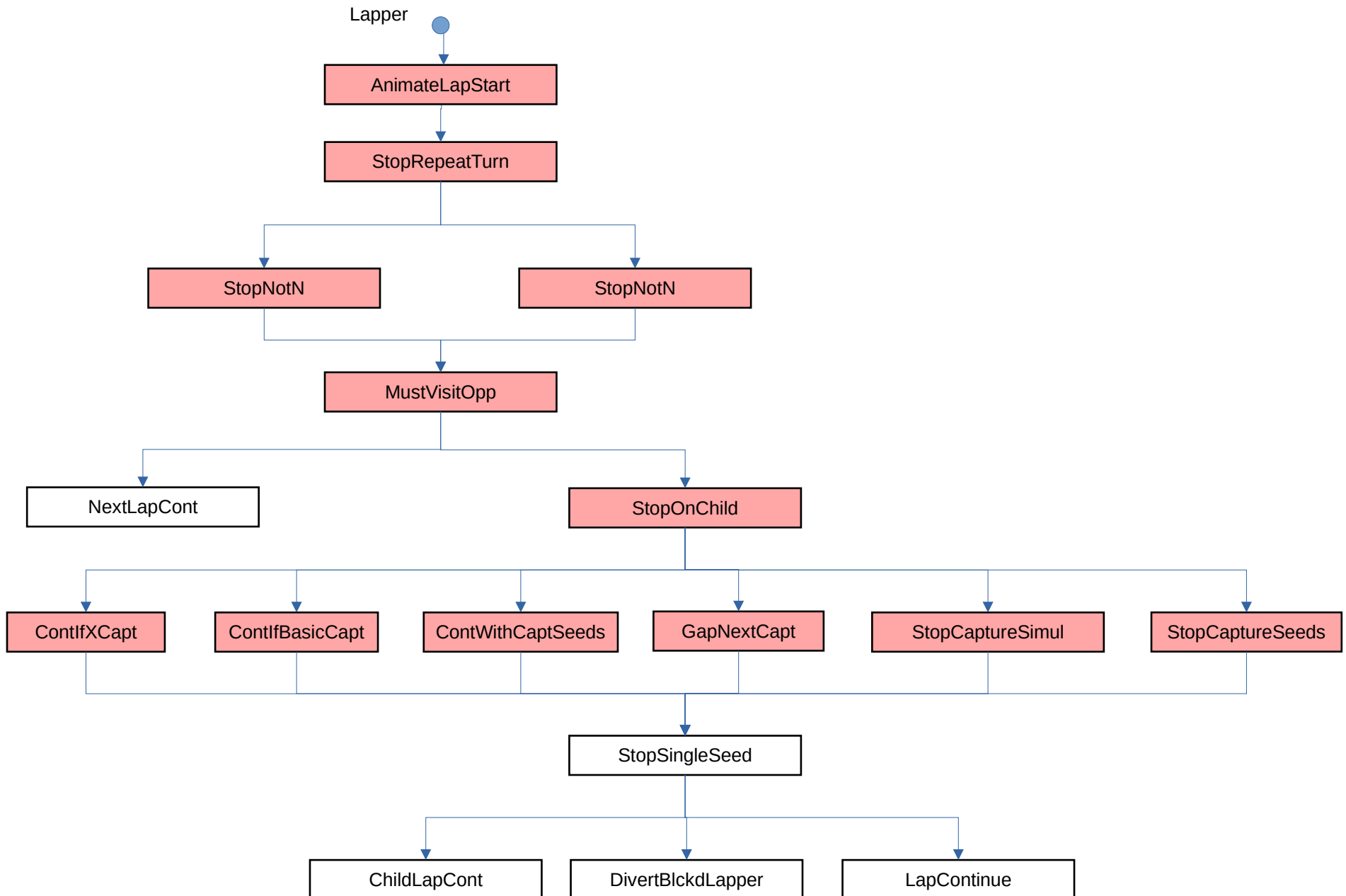
capt_max
capt_min
capt_on
child_type
crosscapt
evens
goal
gparam_one
mlaps
prescribed
presowcapt
sow_direct
sow_own_store
sow_param
sow_rule
visit_opp



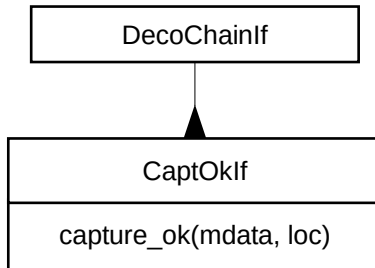
Sower Deco Chain



Lap Continuer Deco Chain and Mlap Operation



Capt Ok Decorators and Chains

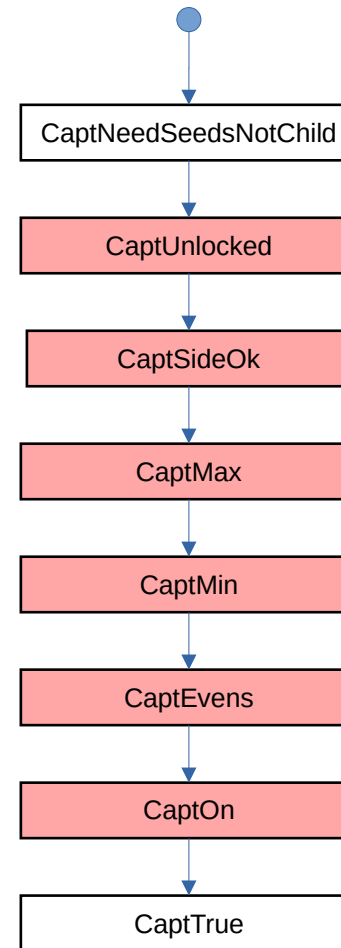


State variables read:

board
child
turn
unlocked

Parameters:

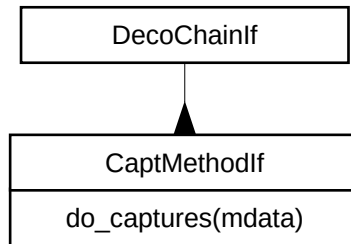
capt_max
capt_min
capt_on
capt_side
moveunlock



This is the Basic Capture Criteria.

These are effectively ANDed. If any deco condition is false, it returns false, otherwise it calls down the deco chain.

Capturer Decorators and Chain



State variables

Reads

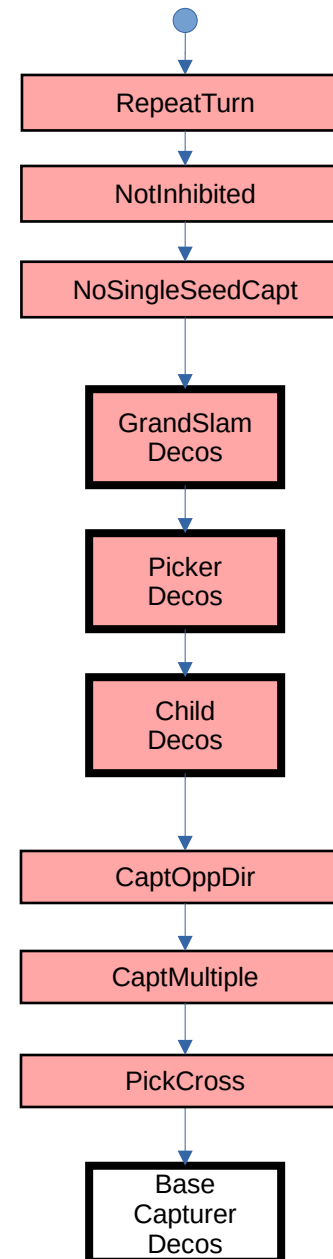
inhibitor
starter
turn

Changes

board
child
store

Parameters:

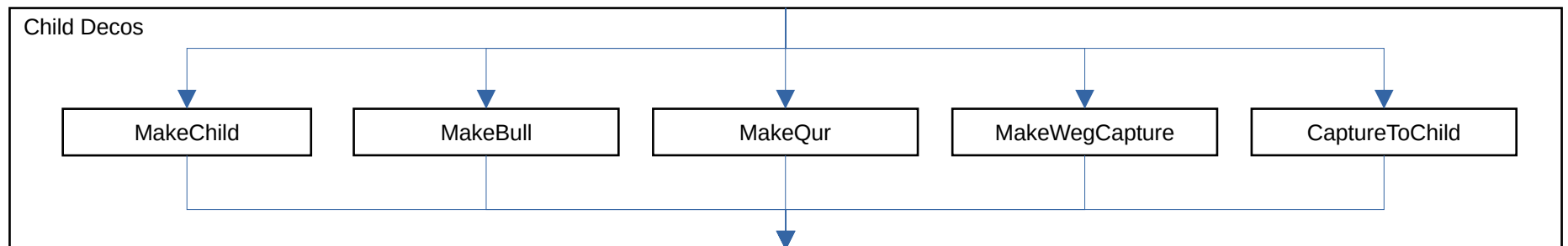
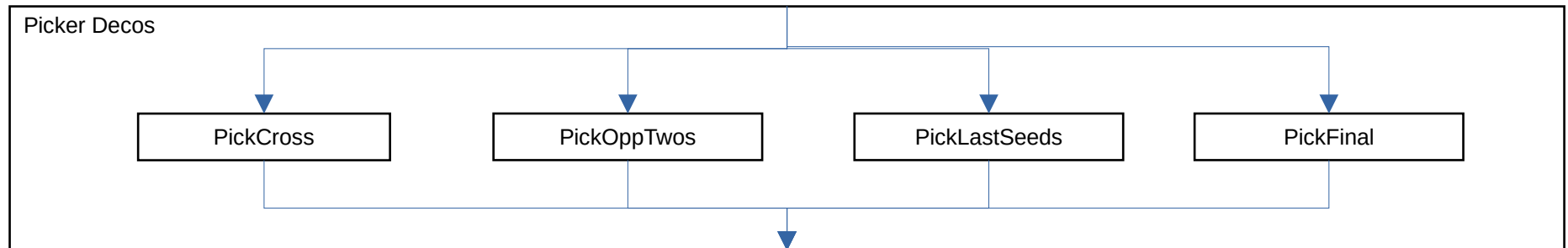
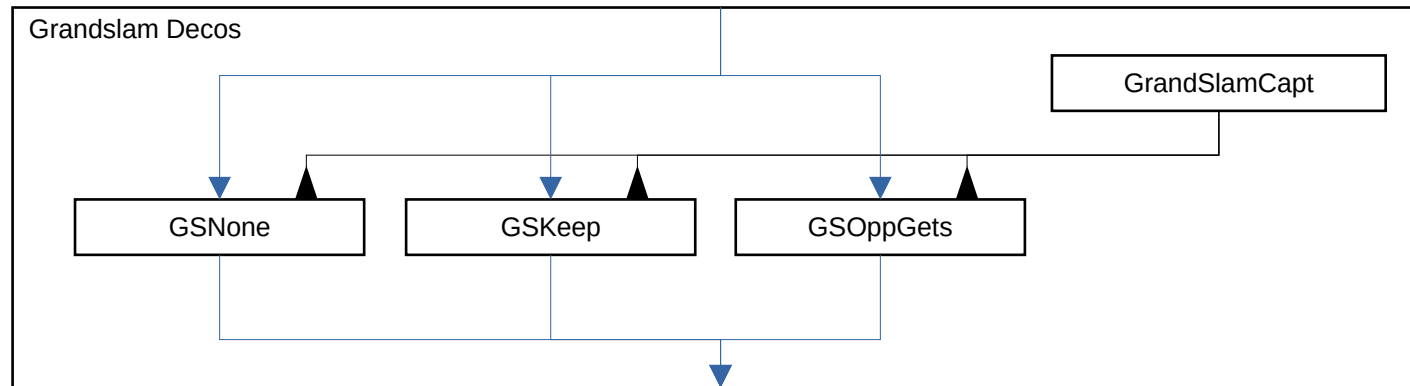
capsamedir
capt_max
capt_min
capt_on
capt_rturn
capt_side
capt_type
child_cvt
child_type
crosscapt
evens
grandslam
mlaps
multicapt
nocaptmoves
nosingcapt
pickextra
prescribed
round_fill
xc_sown
xcpickown



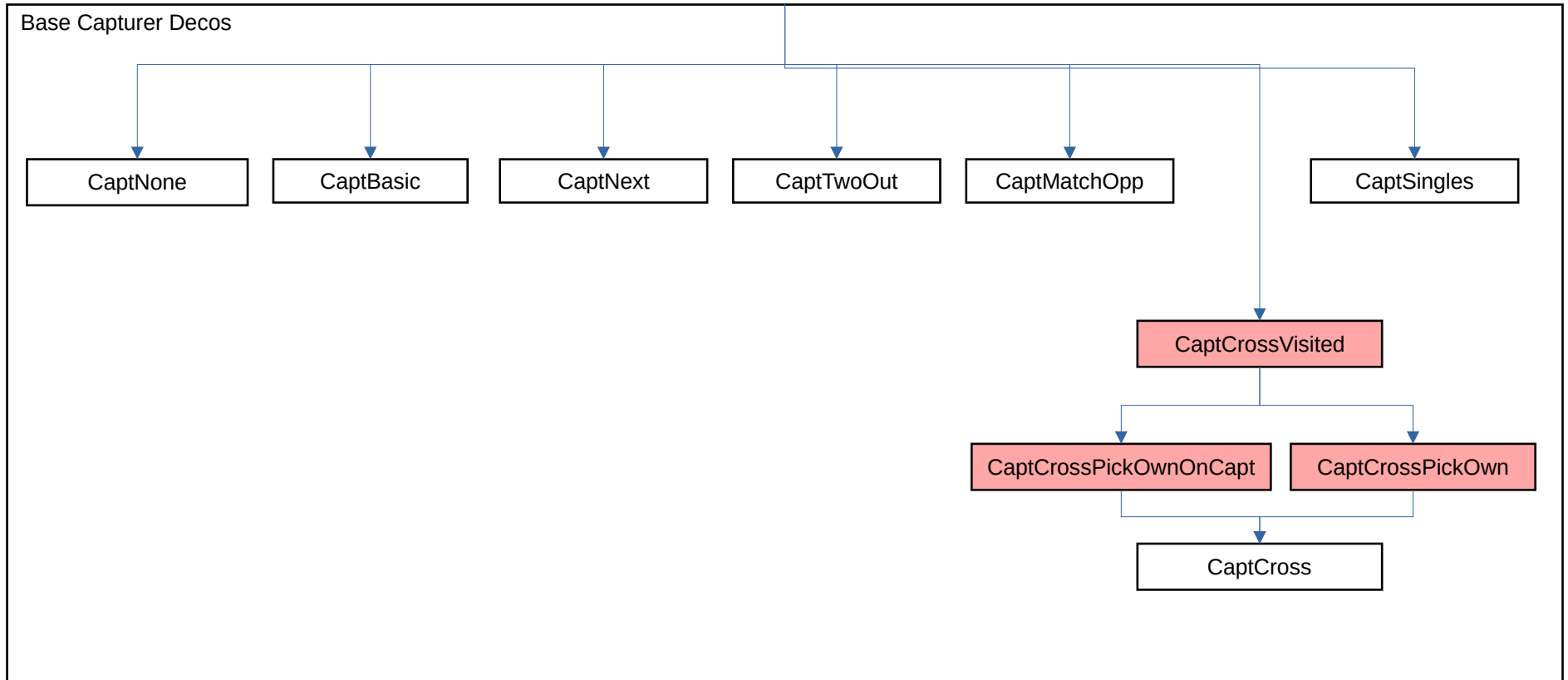
Notes:

- Not all paths are allowed: see ginfo_rules.
- Child and Grand Slam decos cannot occur together.
- Pickers do nothing when a child is made.
- PickCross is only put in the deco chain once, either in Picker Decos or after CaptMultiple.

Capturer Deco Chains (1 of 2)



Capturer Deco Chains (2 of 2)



Ender & Quitter Decorators and Chains (1 of 2)

State variables:

Reads:

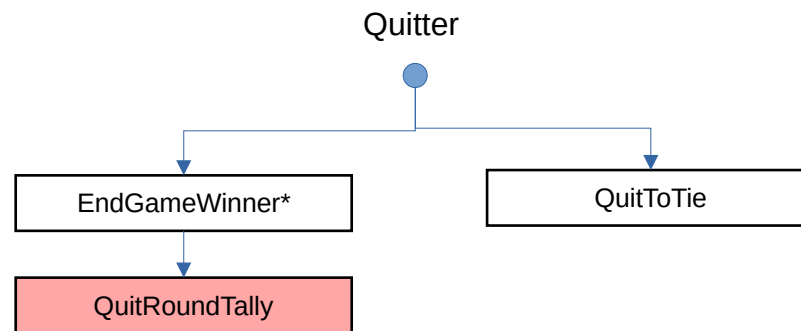
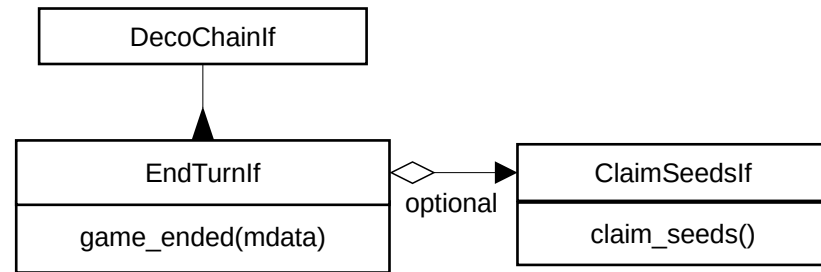
child
owner
turn

Changes:

board
store

Parameters:

capt_min
capt_next
capt_on
capttwoout
child_cvt
child_type
crosscapt
evens
goal
gparam_one
min_move
mlaps
mustpass
mustshare
no_sides
round_fill
rounds
sow_own_store
stores
unclaimed

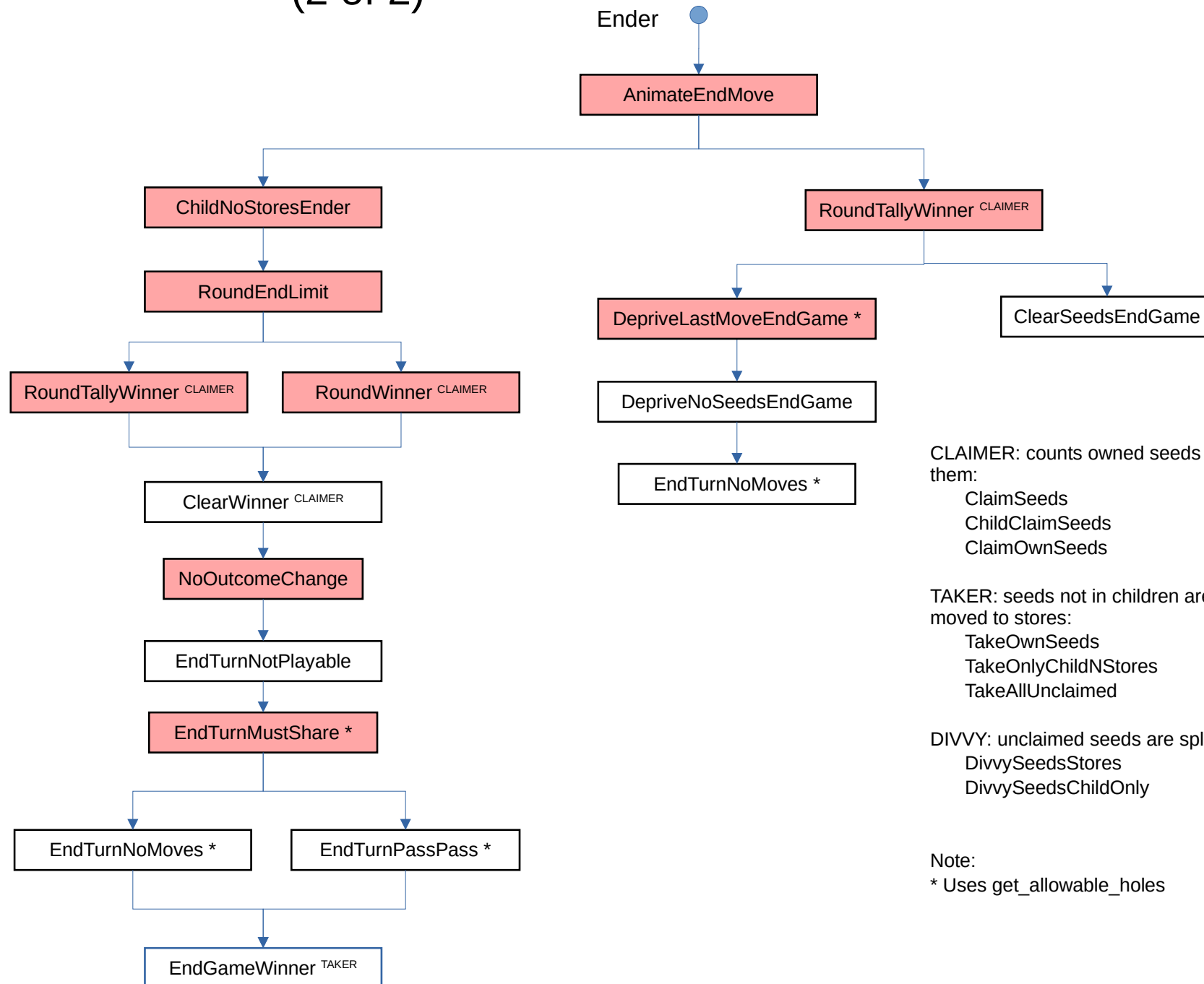


Note:

*A claimer, taker or divvier is selected based on the unclaimed, child_type and store properties (see next page).

Ender & Quitter Decorators and Chains

(2 of 2)



CLAIMER: counts owned seeds but does not move them:

- ClaimSeeds
- ChildClaimSeeds
- ClaimOwnSeeds

TAKER: seeds not in children are claimed and moved to stores:

- TakeOwnSeeds
- TakeOnlyChildNStores
- TakeAllUnclaimed

DIVVY: unclaimed seeds are split between players:

- DivvySeedsStores
- DivvySeedsChildOnly

Note:

* Uses get_allowable_holes