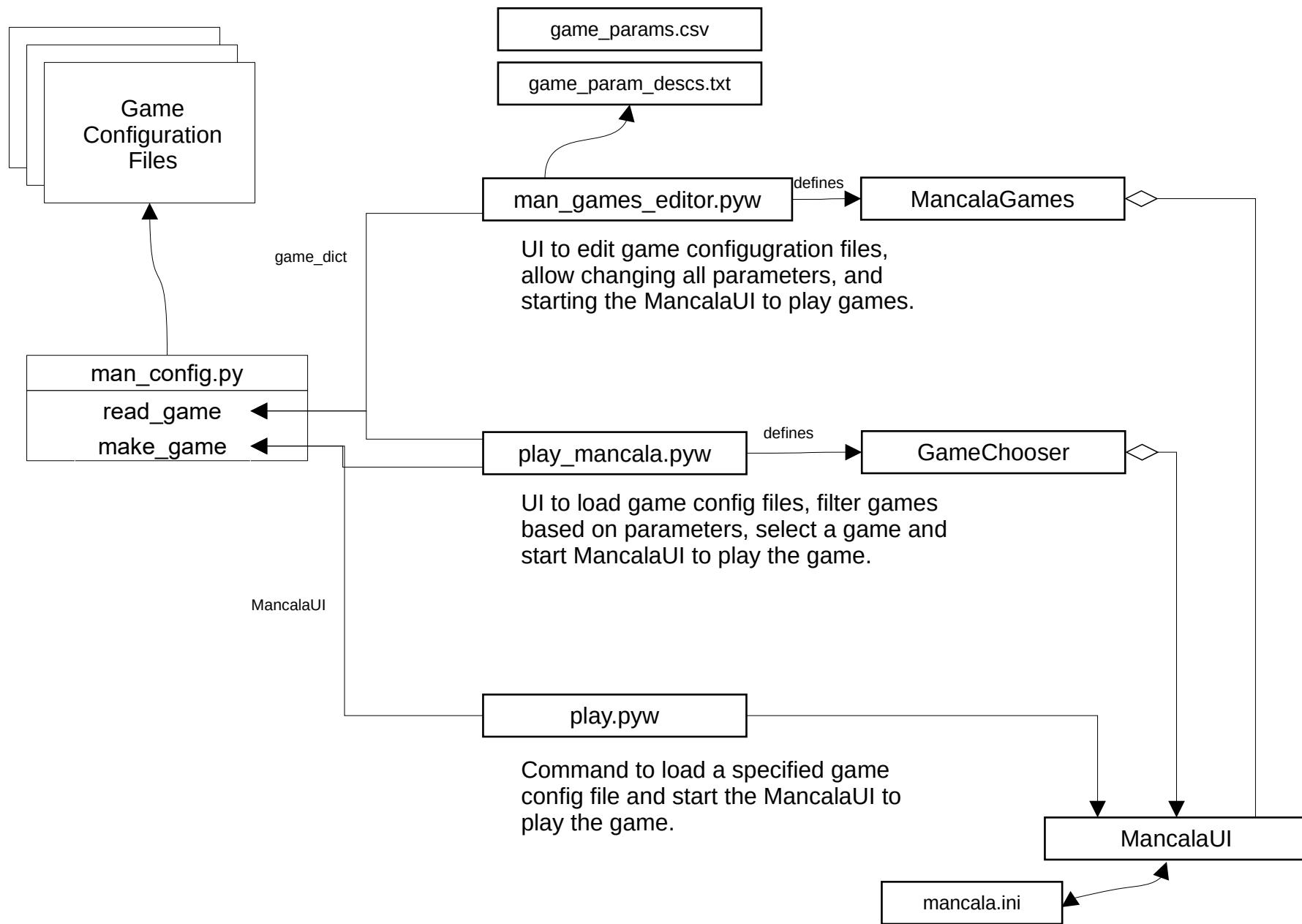
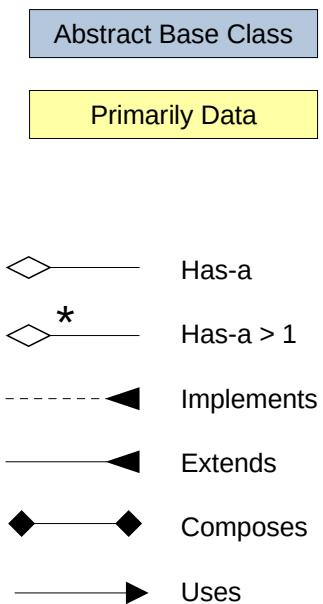


Mancala Games



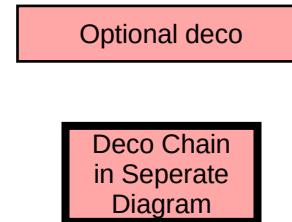
Notation Conventions

Class Diagram Conventions



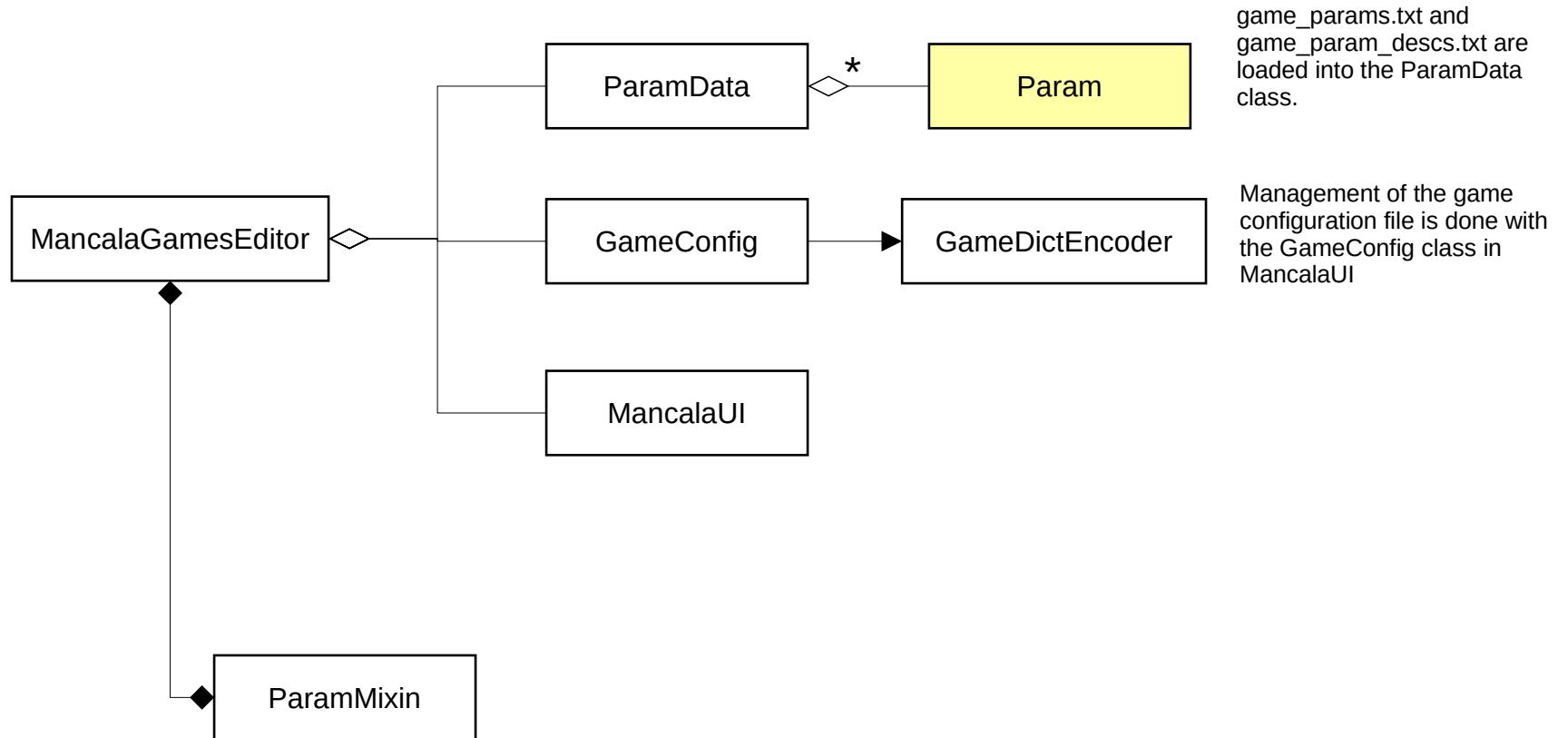
Deco Chain Conventions

- 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).



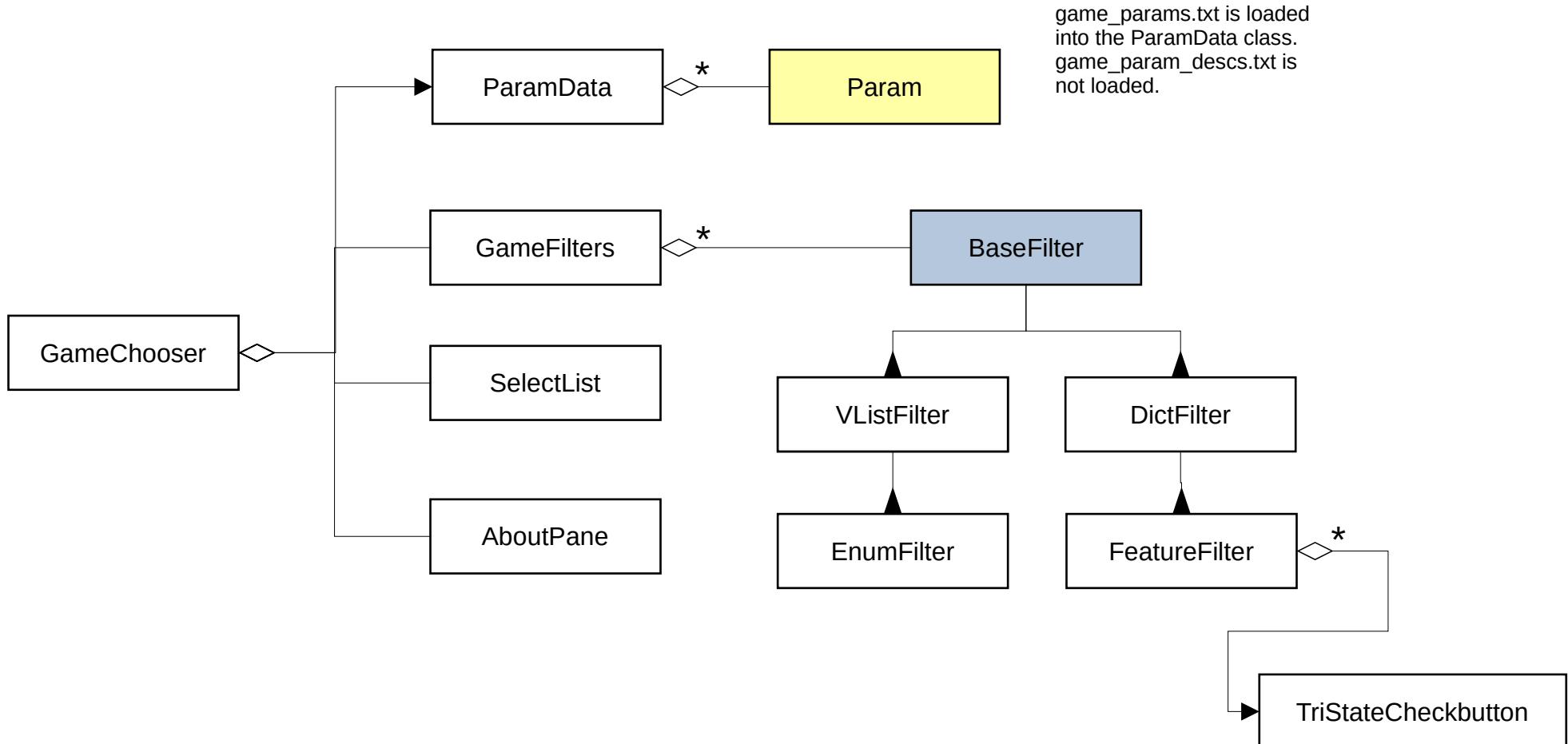
MancalaGamesEditor

man_games_editor.pyw



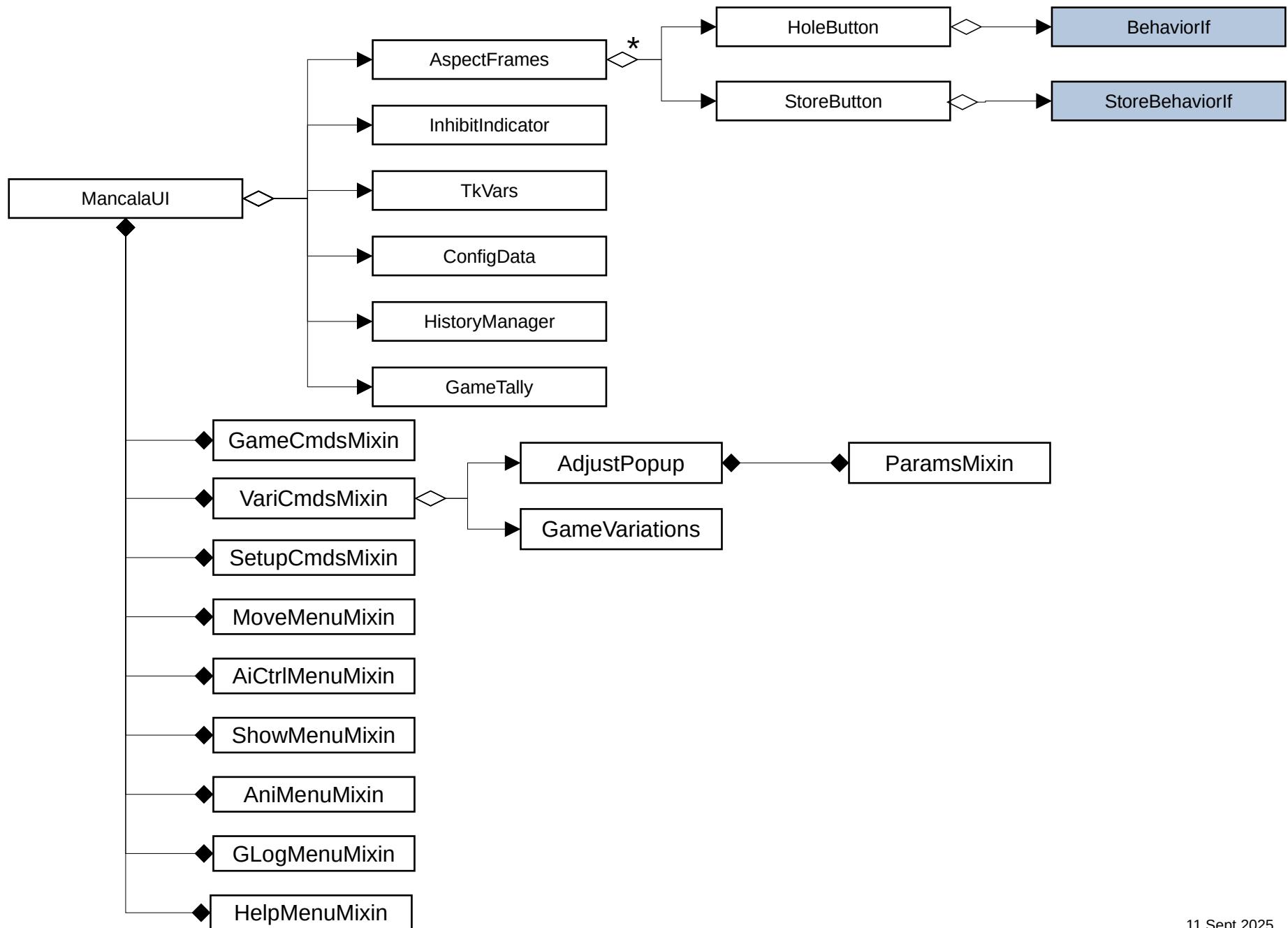
GameChooser

play_mancala.pyw

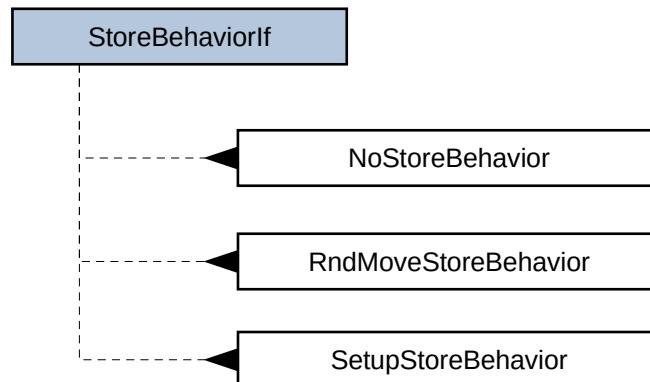
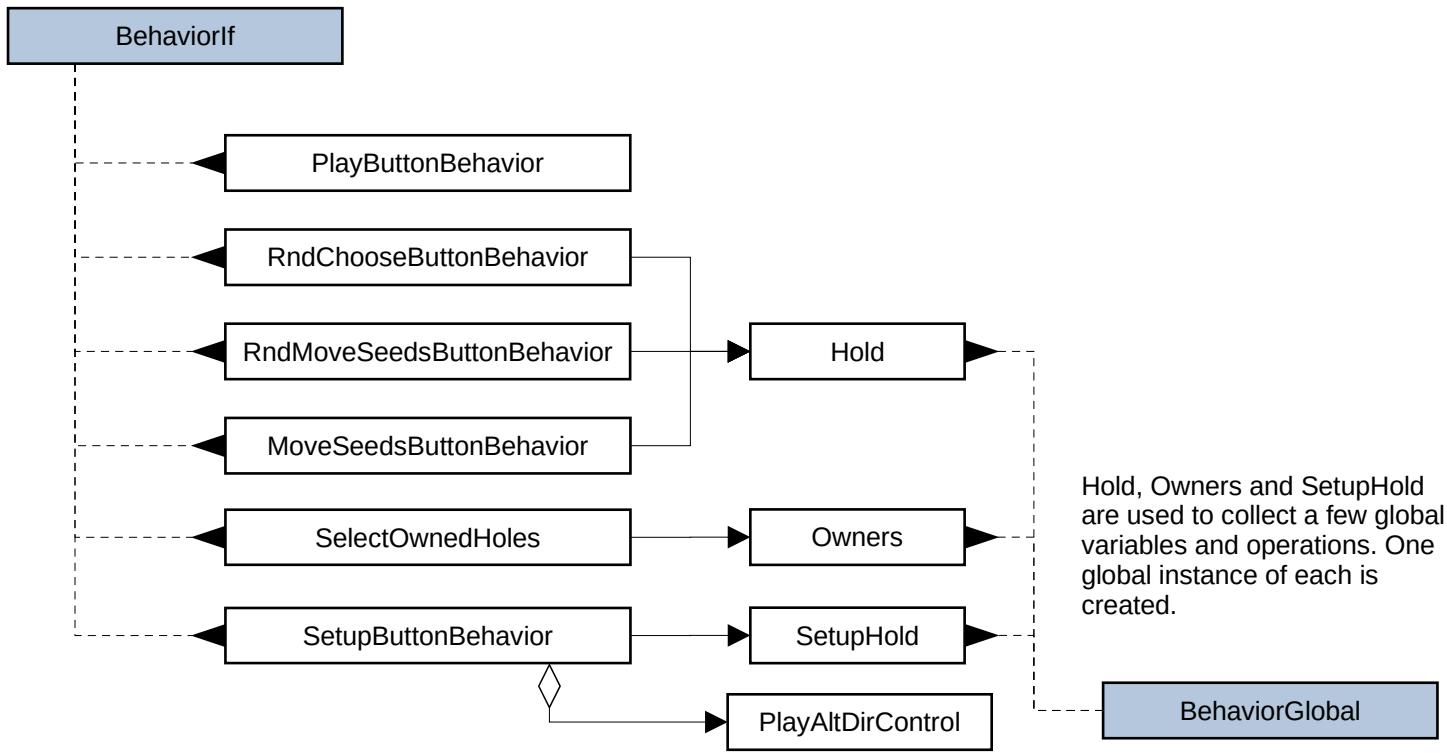


MancalaUI Classes

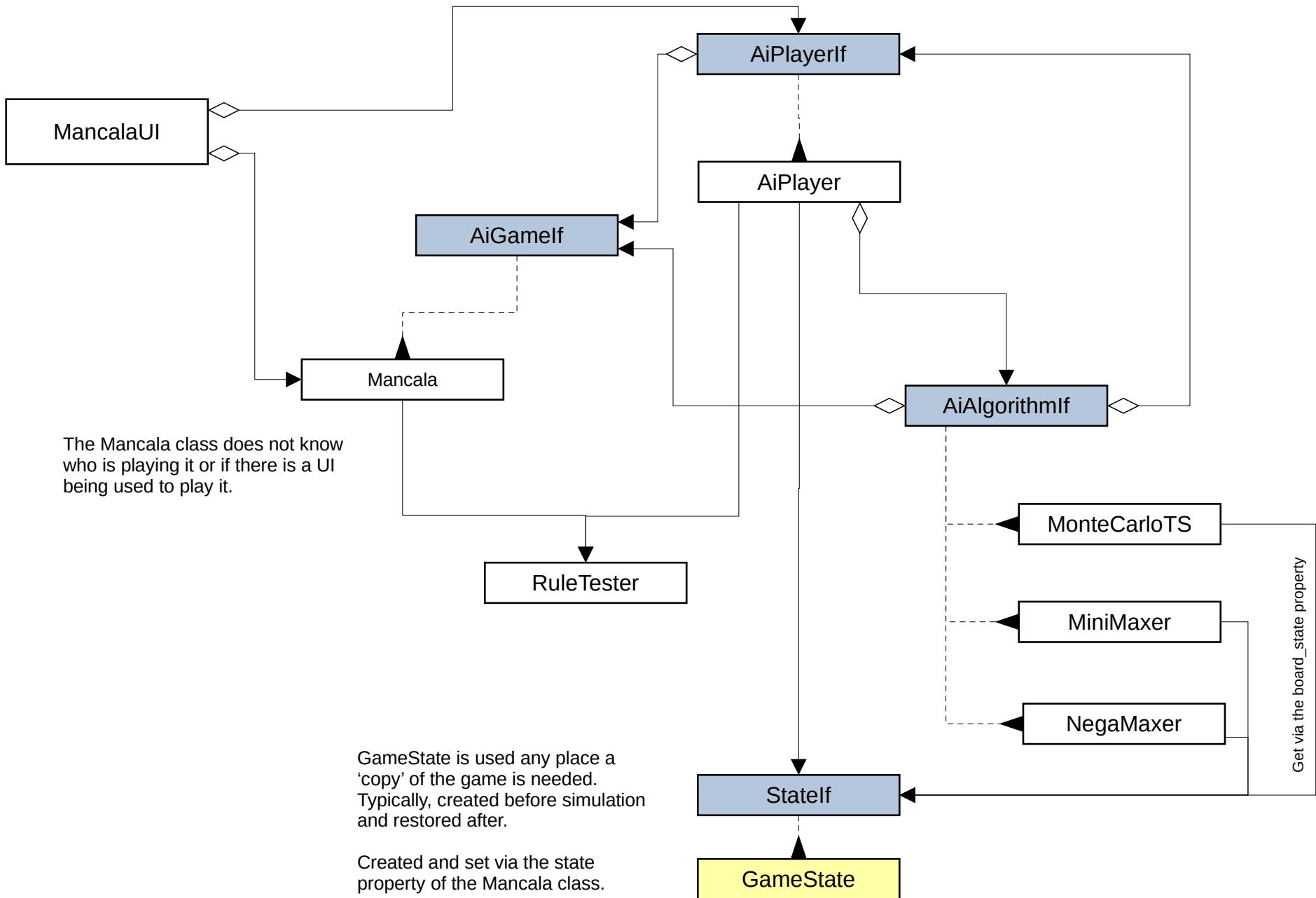
mancala_ui.py



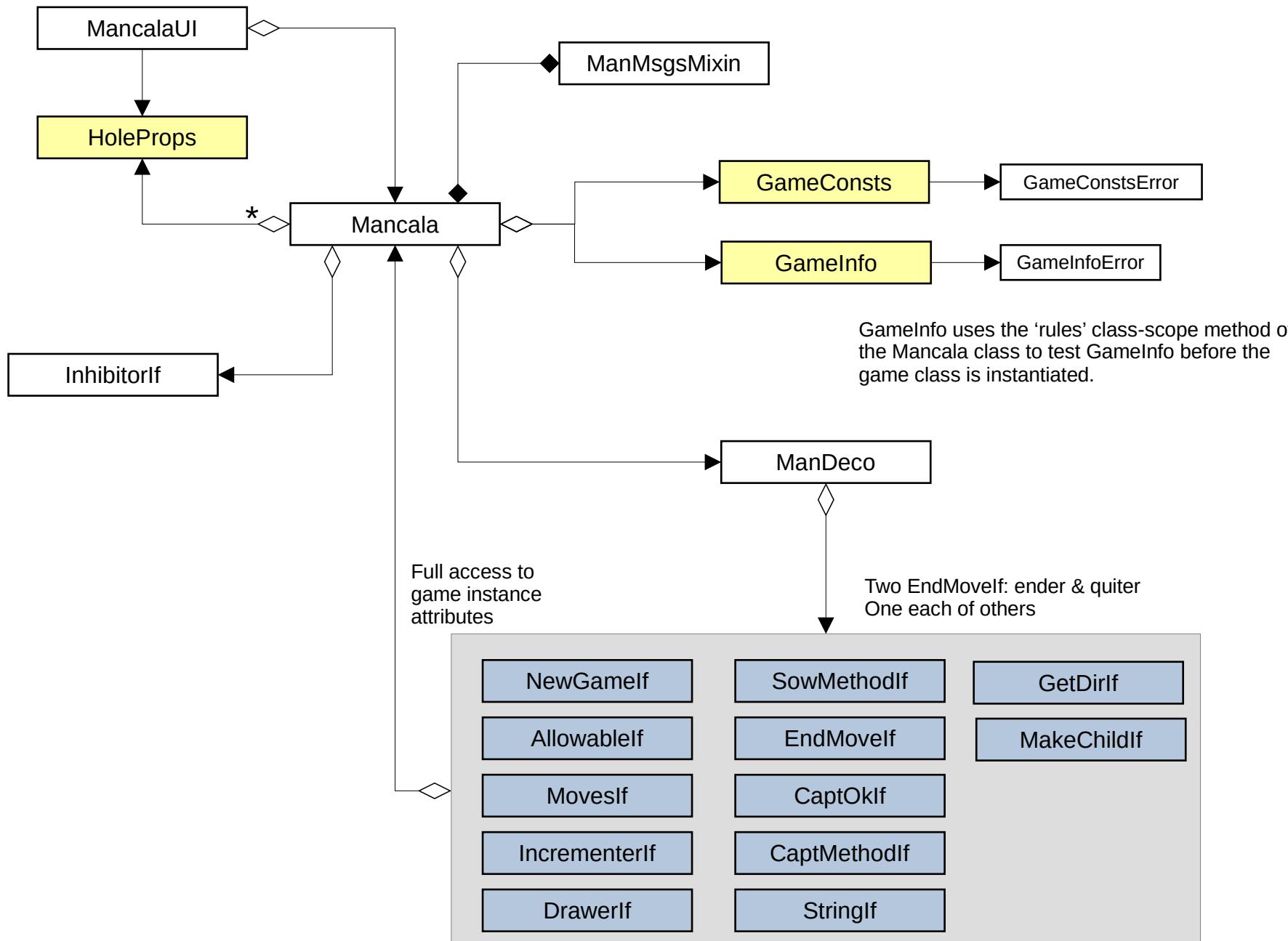
Behavior Classes for MancalaUI



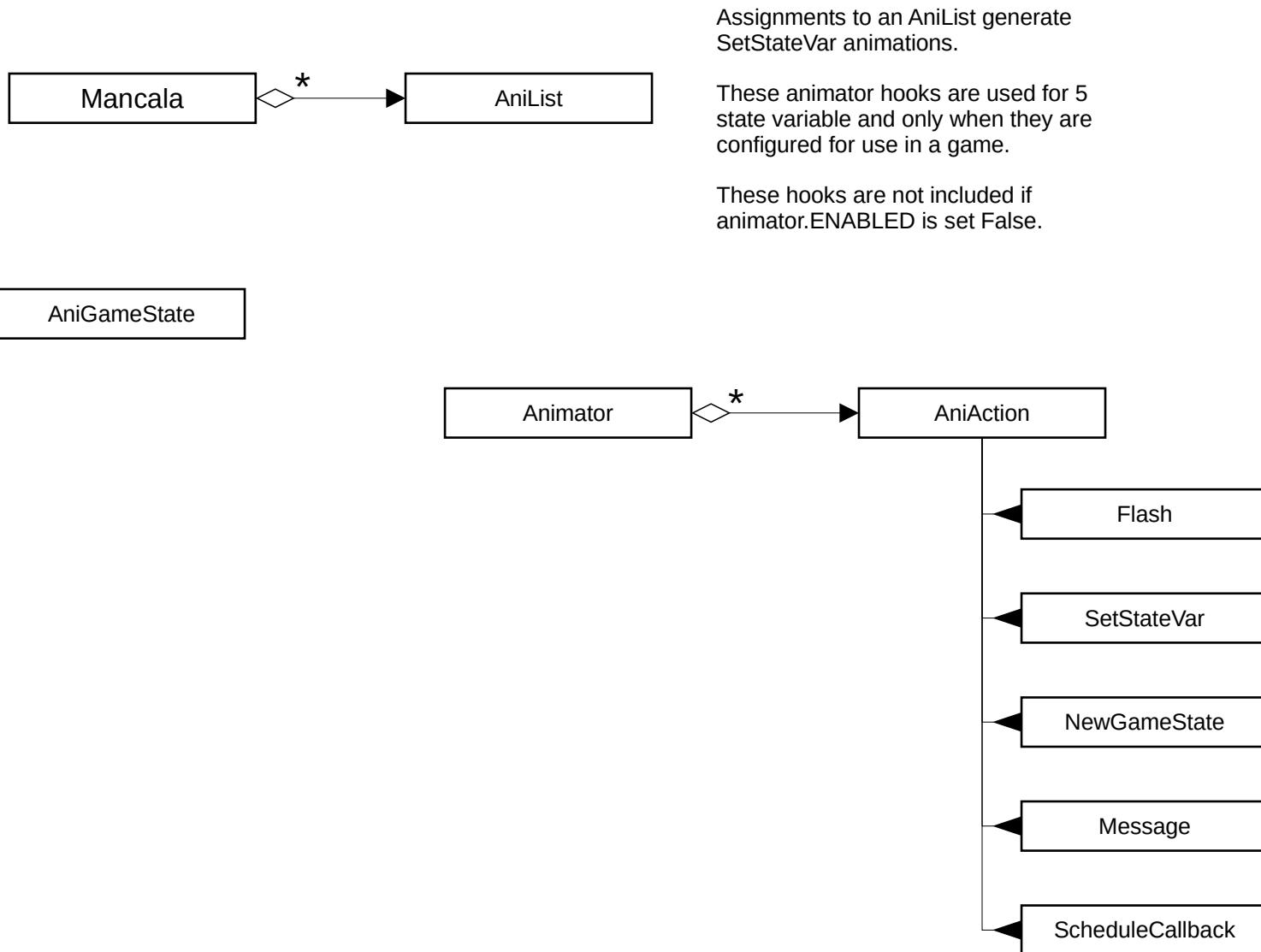
AIPlayer and AIAlgorithm Integration



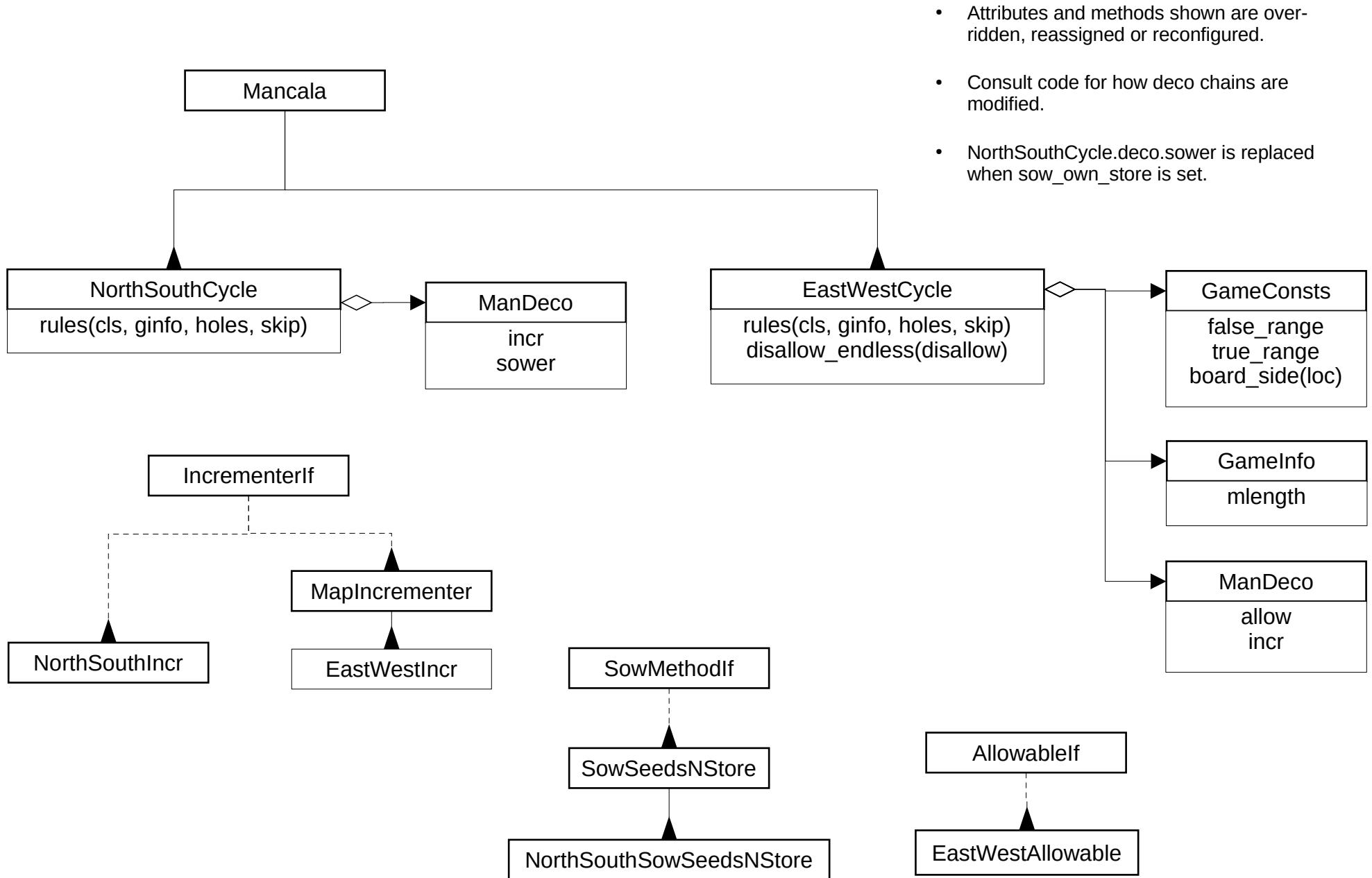
Mancala Classes



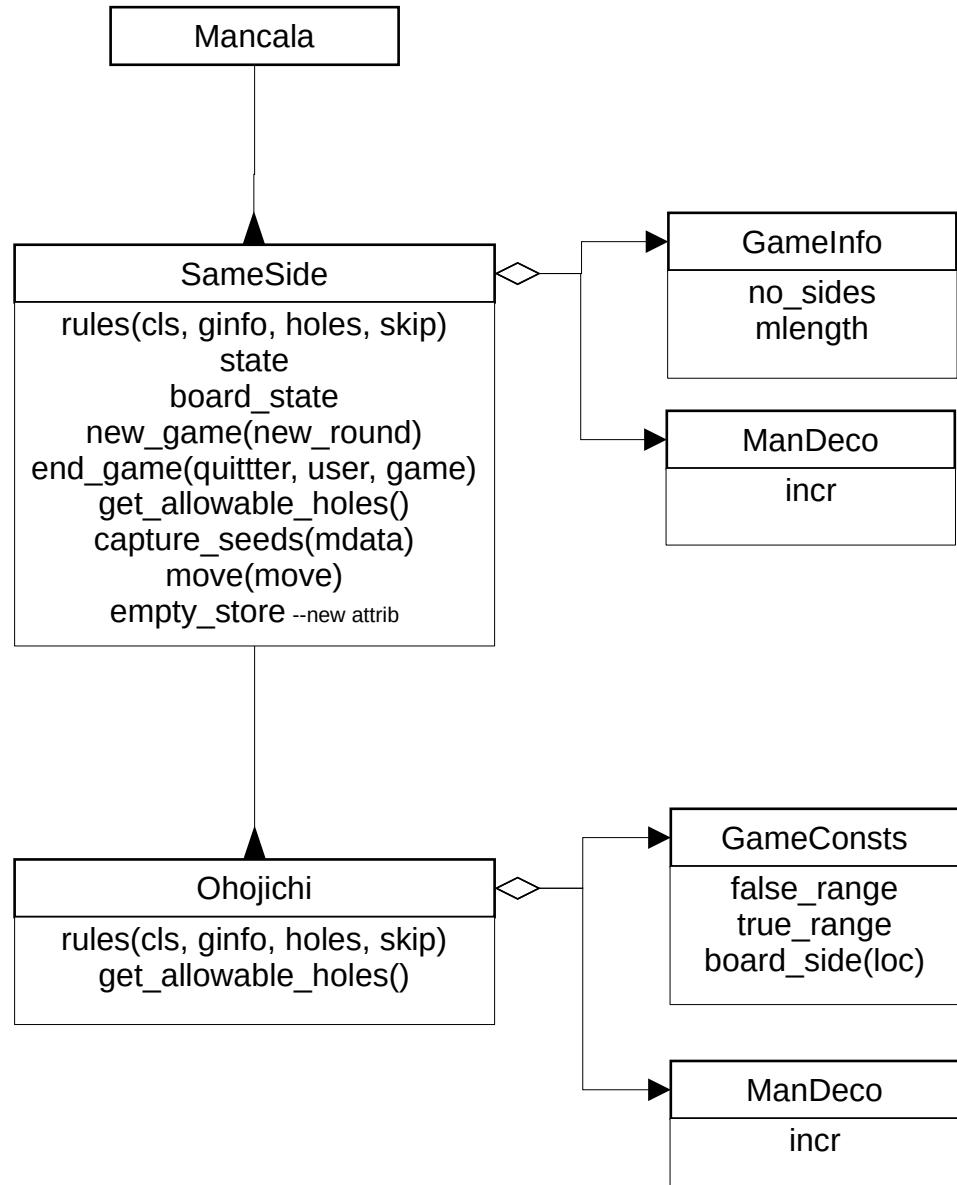
Animator Classes



Two Cycle Game Classes

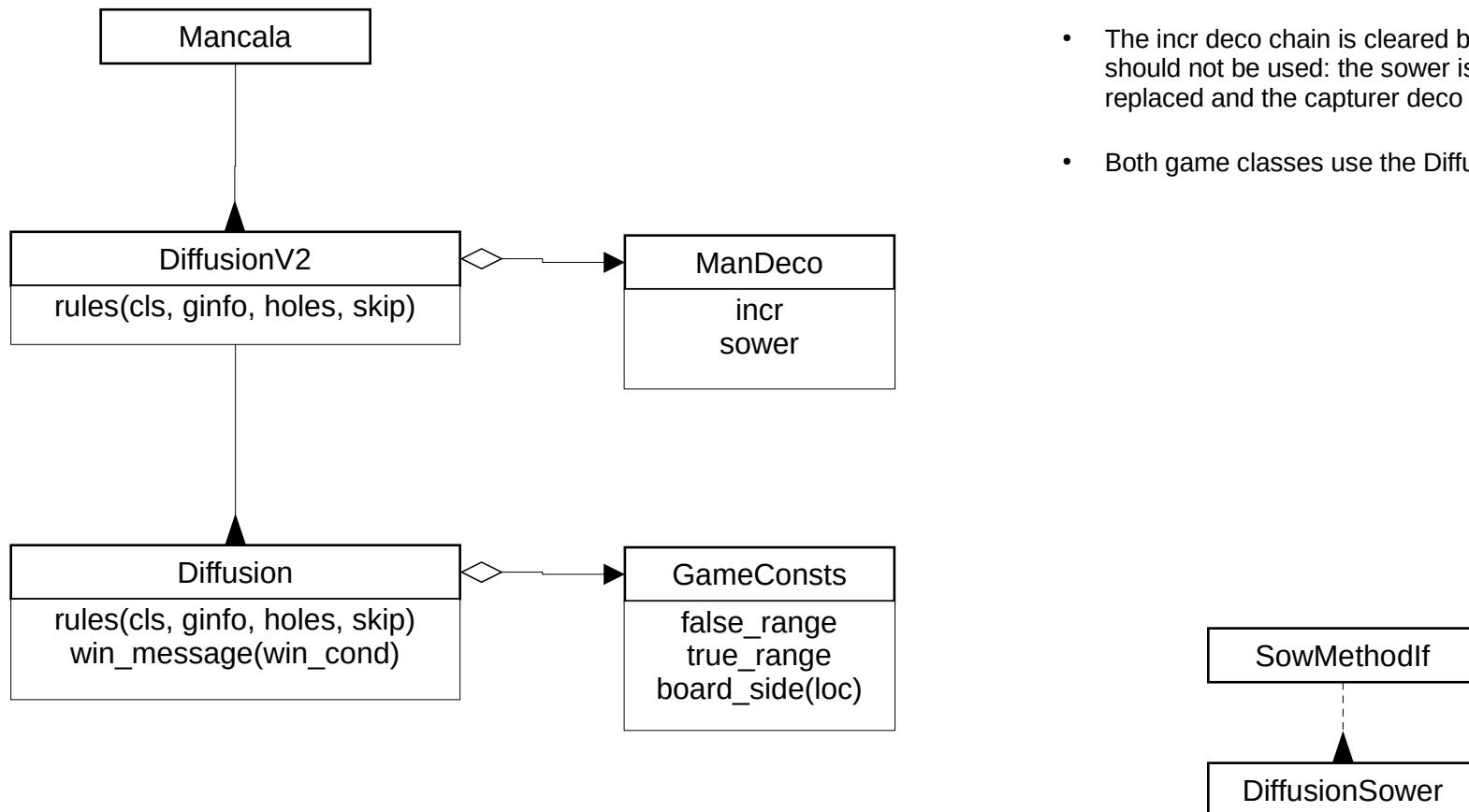


SameSide and Ohojichi Game Classes



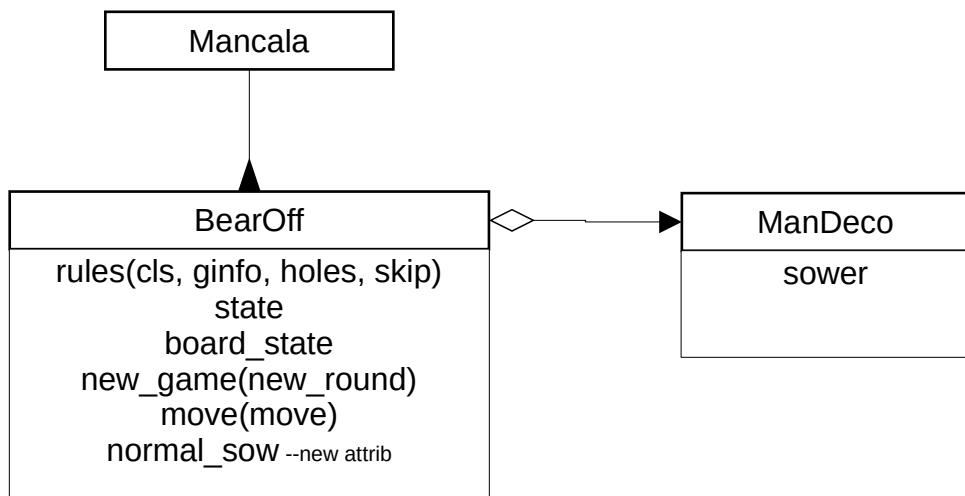
- Attributes and methods shown are overridden, reassigned or reconfigured.
- Each game class uses the appropriate two_cycle incrementer as the base incrementer.
- Ohojichi only calls the allow deco chain when on the first part of turns, not on the place seeds opposite part.

Diffusion and DiffusionV2 Game Classes



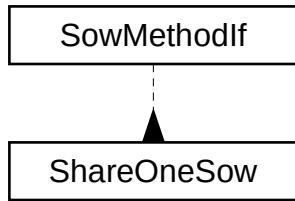
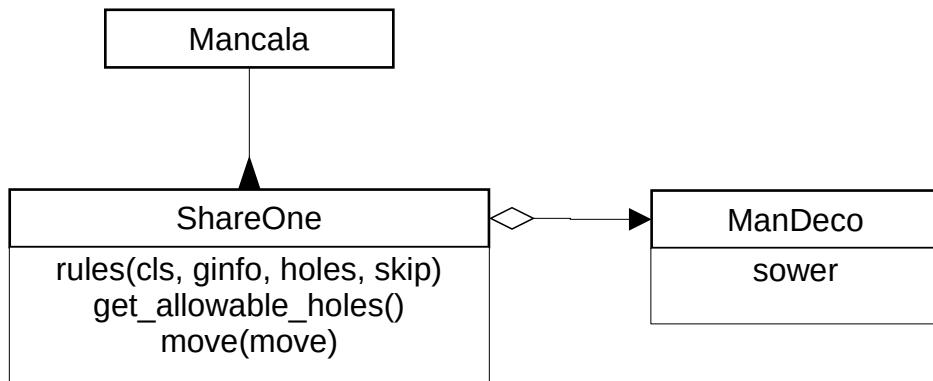
- Attributes and methods shown are overridden, reassigned or reconfigured.
- The incr deco chain is cleared because it should not be used: the sower is completely replaced and the capturer deco is CaptNone.
- Both game classes use the DiffusionSower.

Bear Off Game Class



- Attributes and methods shown are overridden, reassigned or reconfigured.
- The BearOff sower is inserted in the deco chain before the single sower. The BearOffSower either does the bear off style sowing or calls down the deco chain to the original single sower.

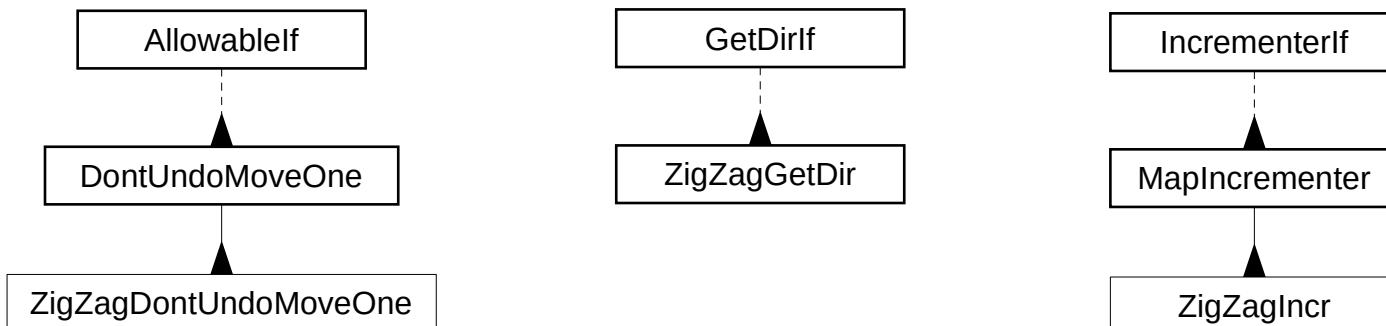
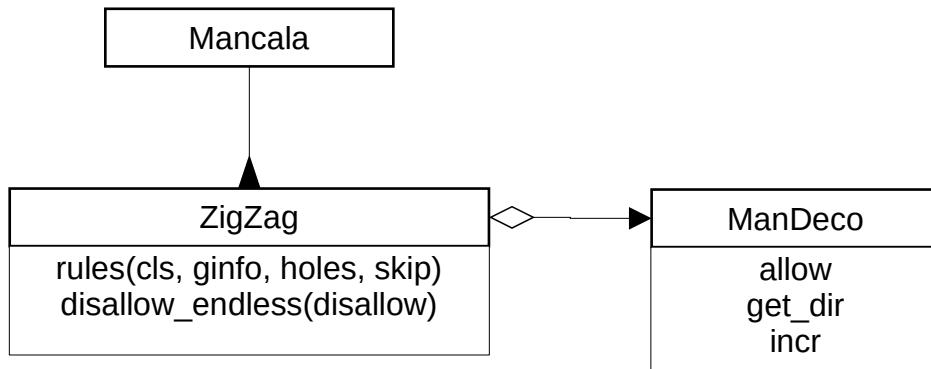
ShareOne Game Class



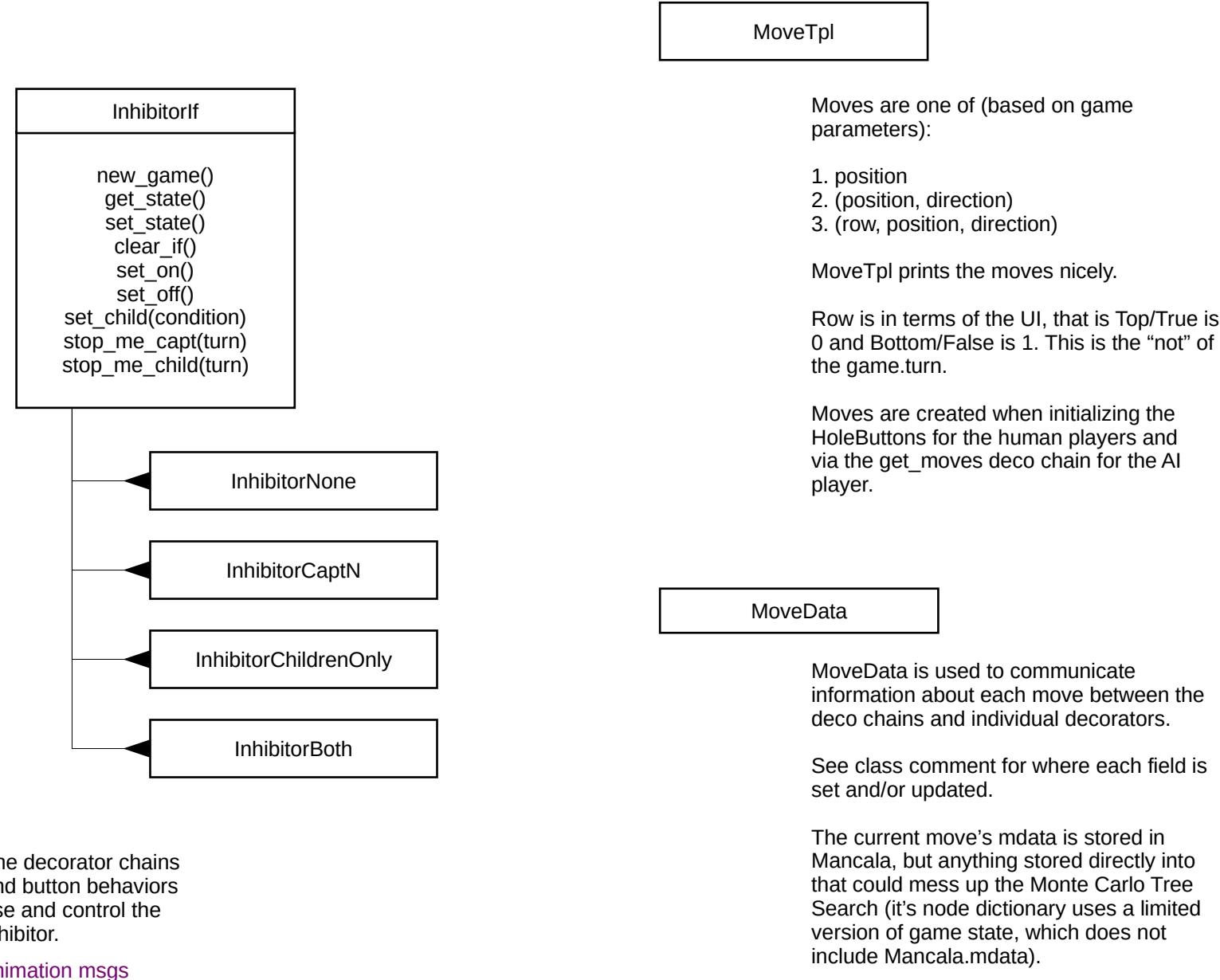
- Attributes and methods shown are over-ridden, reassigned or reconfigured.
- If the move will be a share one move, only holes that are not children with 2 or more seeds are allowable (the allow deco is not used); otherwise, the deco chain is used.
- If the next move is to share one seed and the animator is active, a message is popped up via the move method override.
- ShareOneSow wraps the existing deco chain and performs an alternate sow to share the one seed.

ZigZag Game Class

- Attributes and methods shown are over-ridden, reassigned or reconfigured.
- ZigZag Cycle:
 - The ZigZag cycle is similar to the normal cycle in that each hole is visited once before any hole is visited a second time.
 - The cycle is generated as though sowing from South's Leftmost hole (loc 0) through the board to North's Rightmost hole.
 - The sow direction describes which way through this cycle and the incrementer should move.
- Consult code for how deco chains are modified.



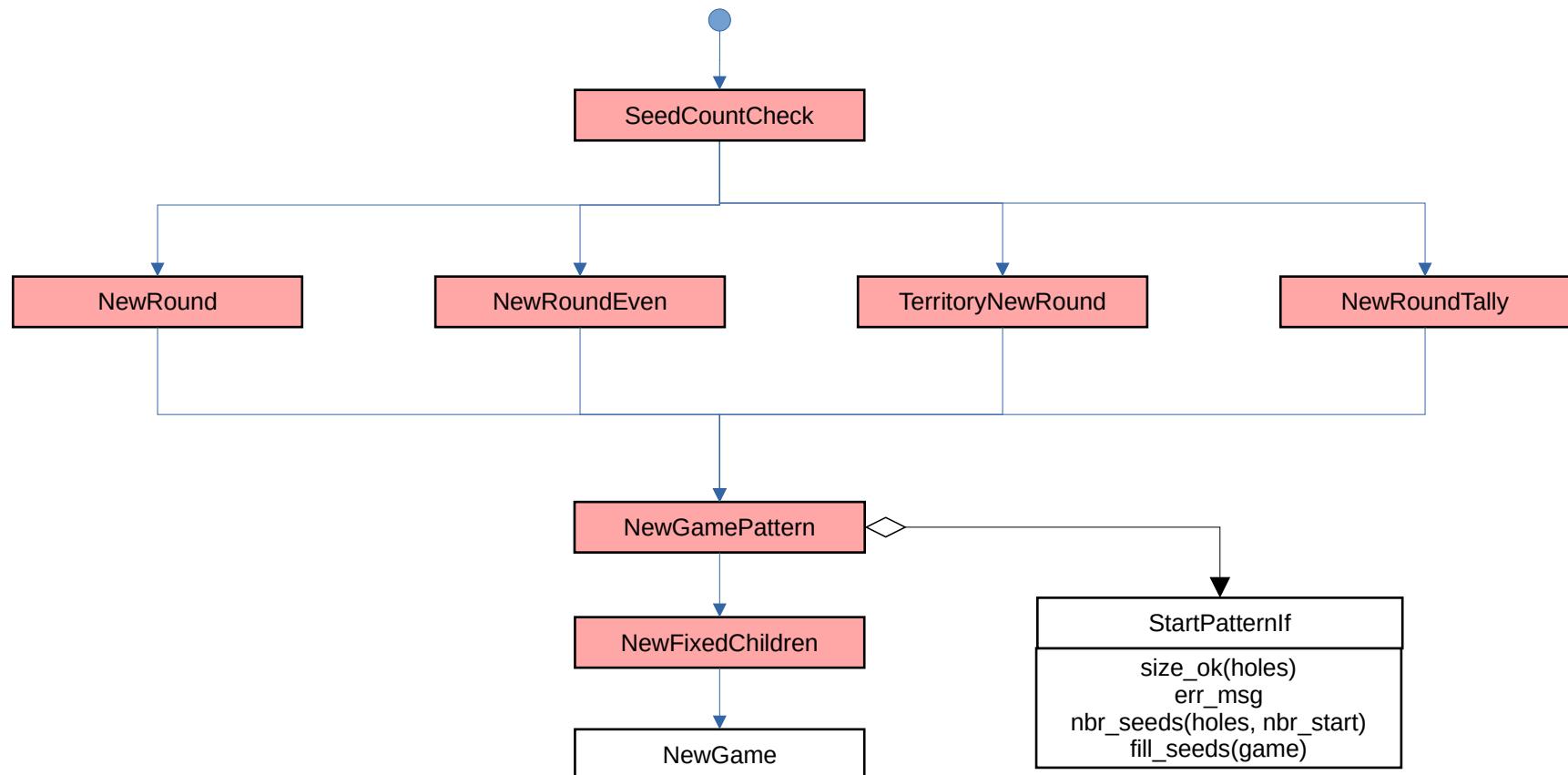
Important Classes for Moves



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	MoveData	The game needs to end either because of endless sow or user selection. If not configured to do something else, unclaimed seeds are divvied between the players.

New Game Decorators and Chain

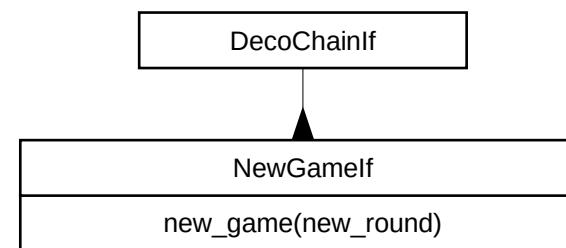


State variables changed:

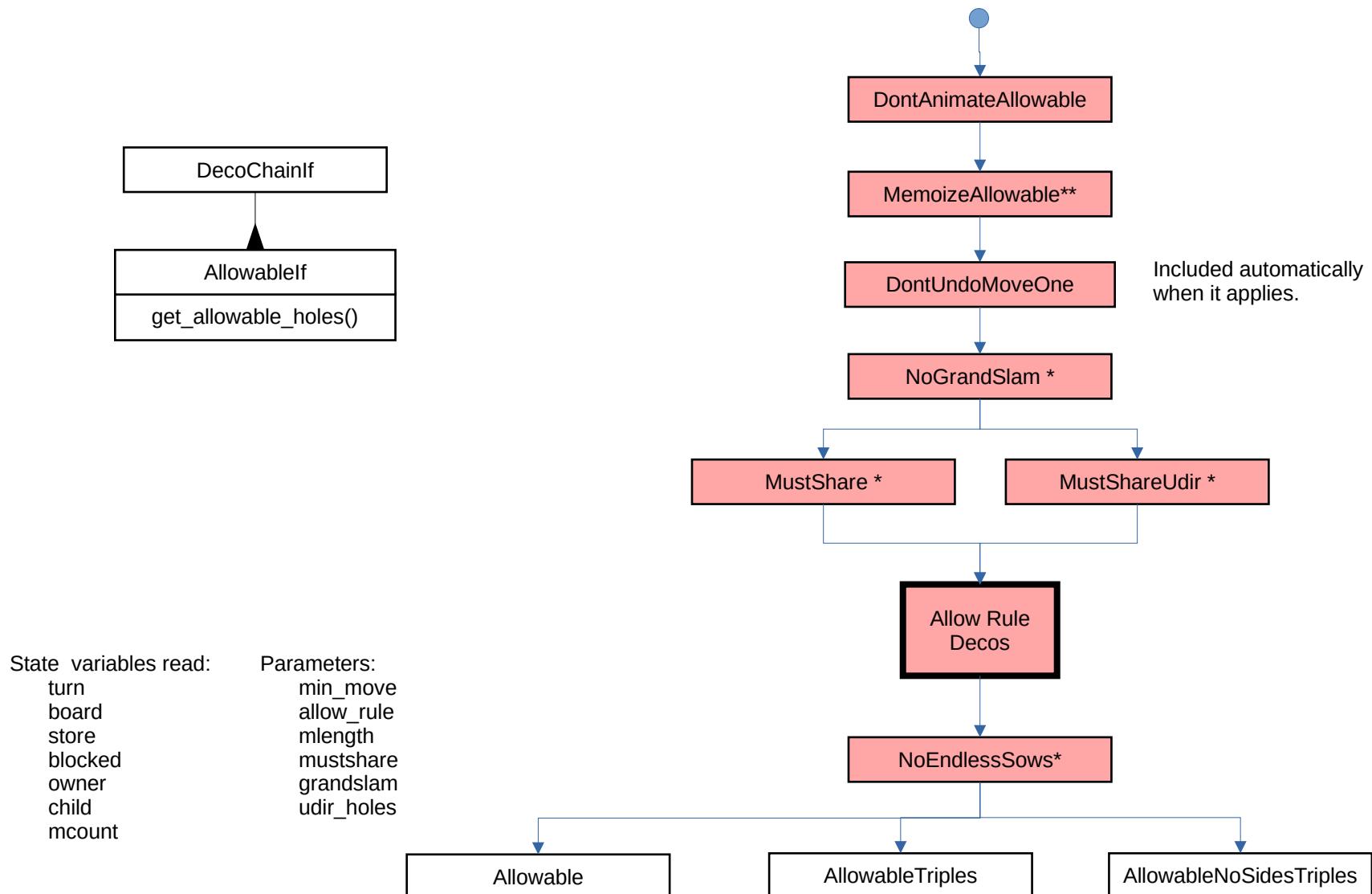
blocked
board
owner
starter
store
turn

Parameters:

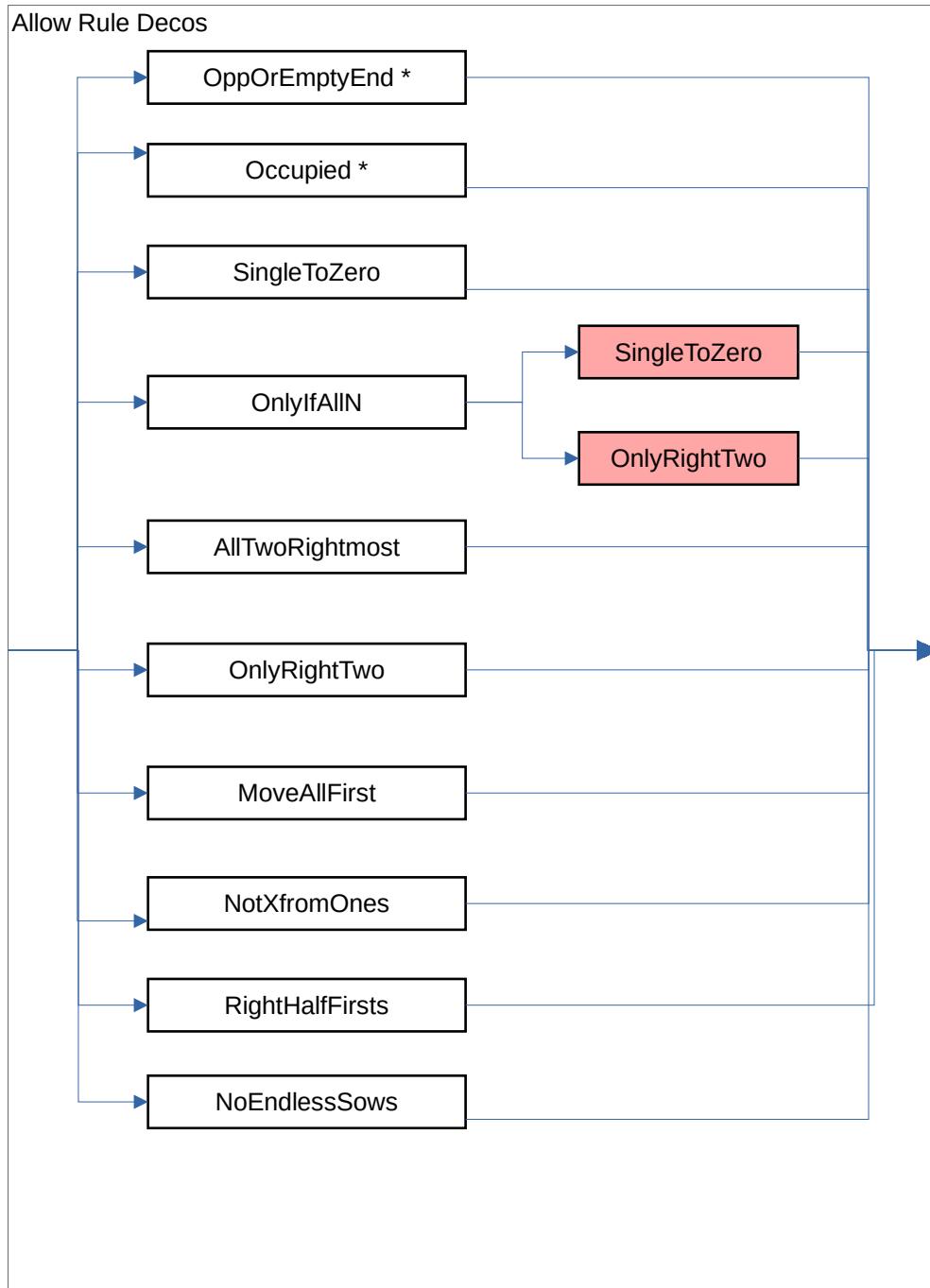
blocks
goal
min_move
round_starter
round_fill
rounds
start_pattern



Allowables Decorators and Chain



Allow Rule Decos

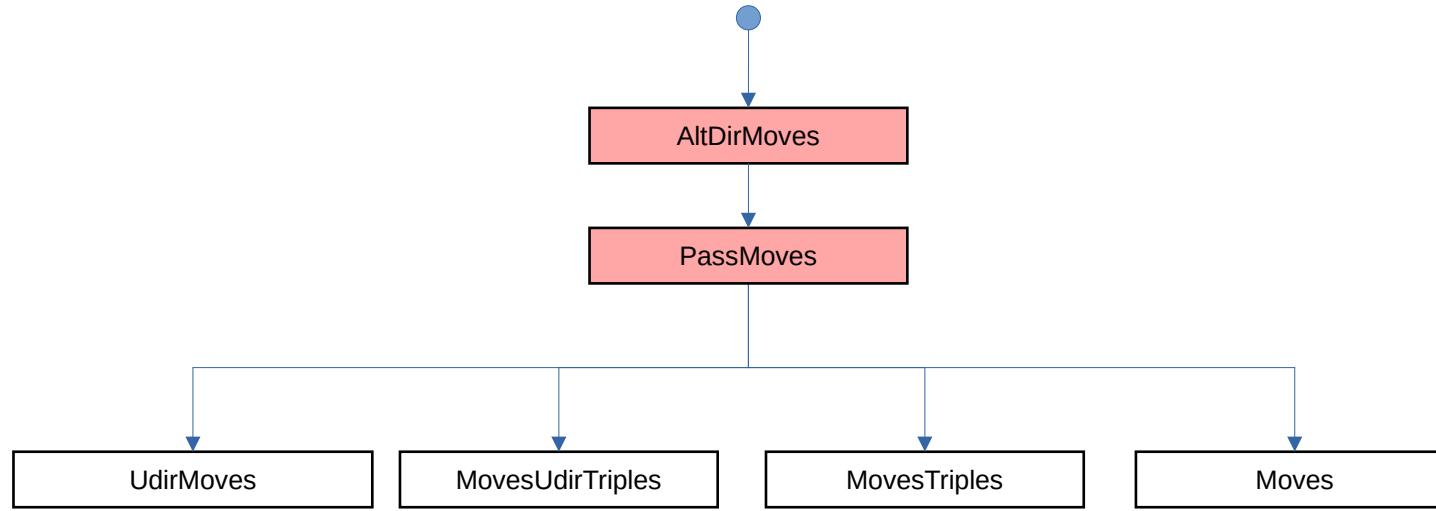


Notes:

Some allow rule decos are shown more than once for clarity.

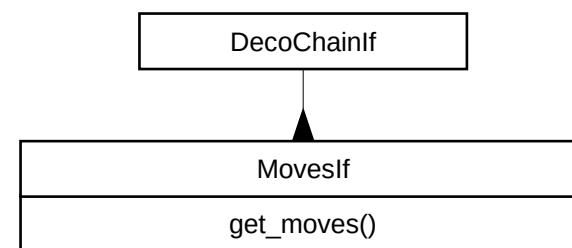
* Simulates some portion of moves to determine allowables

Get Moves Decorators and Chain

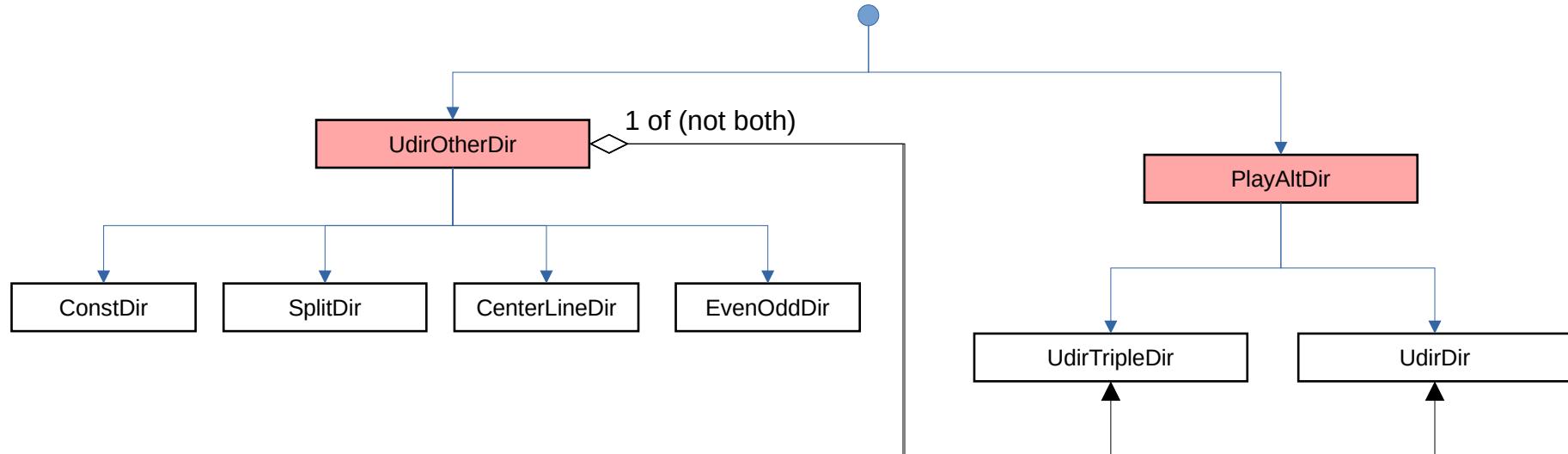


State variables read:
blocked
board
owner
starter
store
turn

Parameters:
mlength
mustpass
sow_direct
udir_holes
udirect

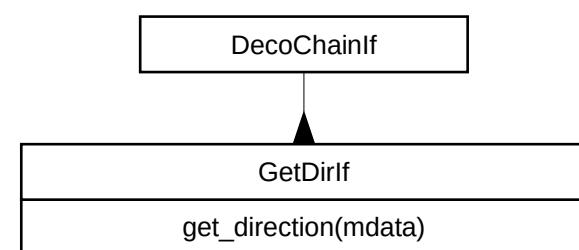


Get Direction Decorators and Chain

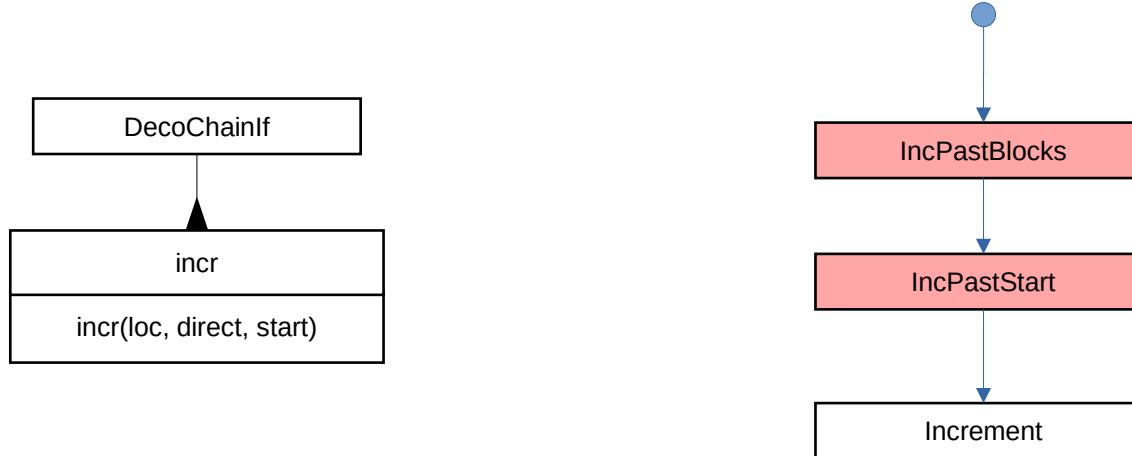


State variables read:
mcount
turn

Parameters:
no_sides
sow_direct
udir_holes
udirect



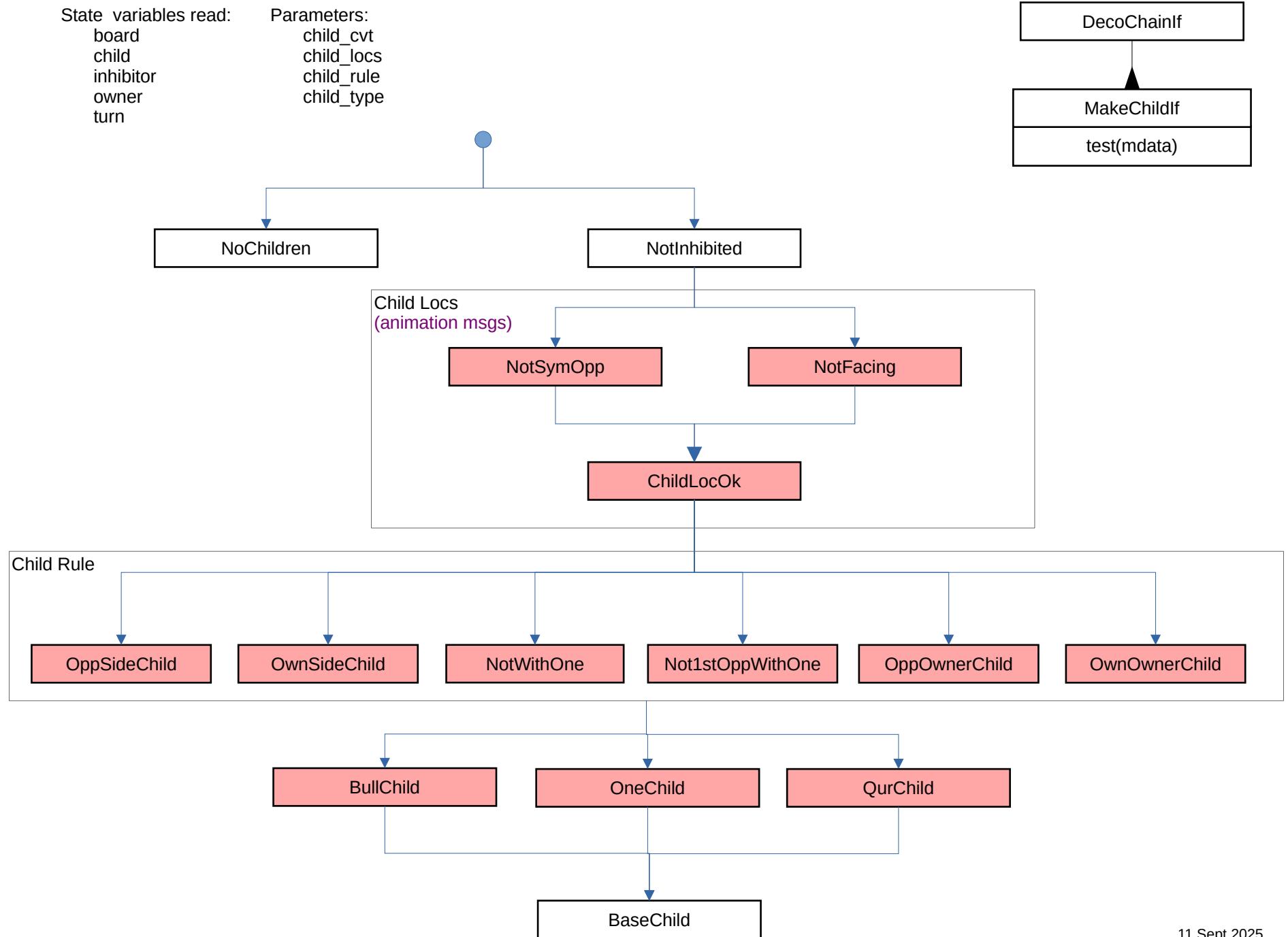
Incrementer Decorators and Chains



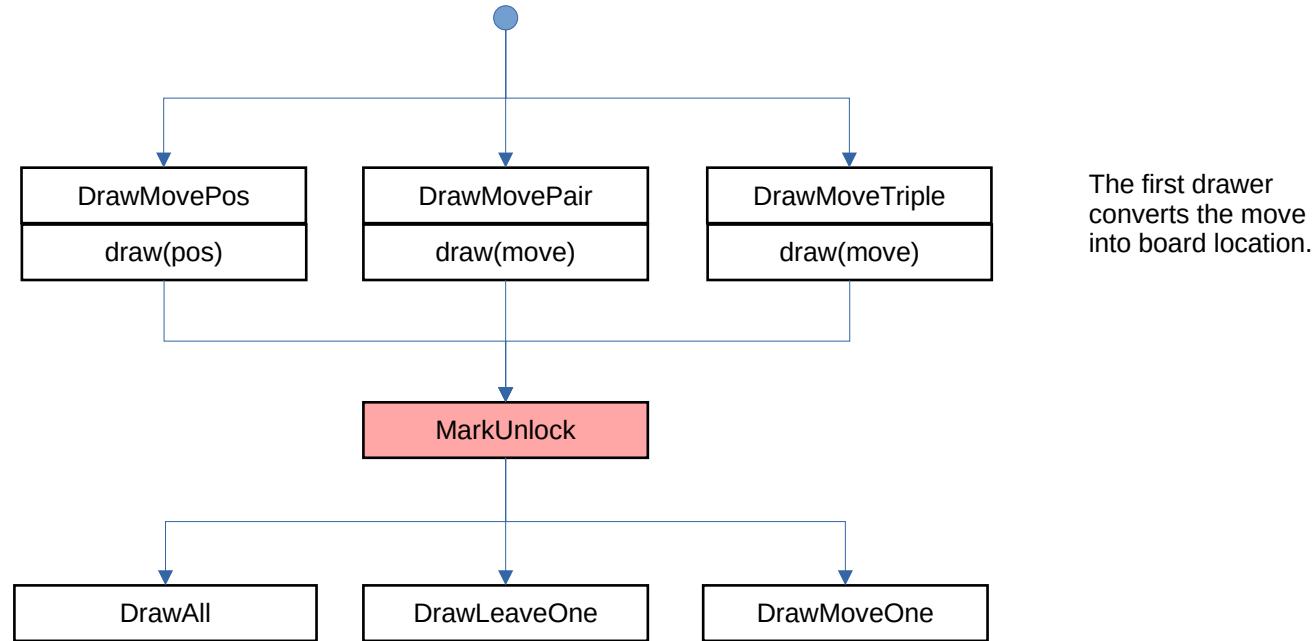
State variables read:
blocked

Parameters:
blocks
skip_start

MakeChild Decorator and Chain

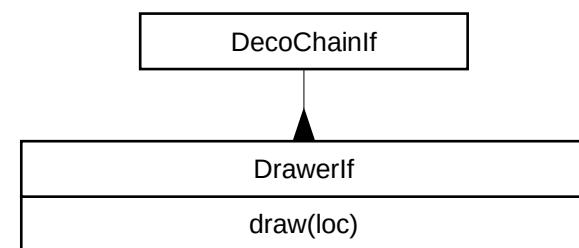


Draw Decorators and Chain

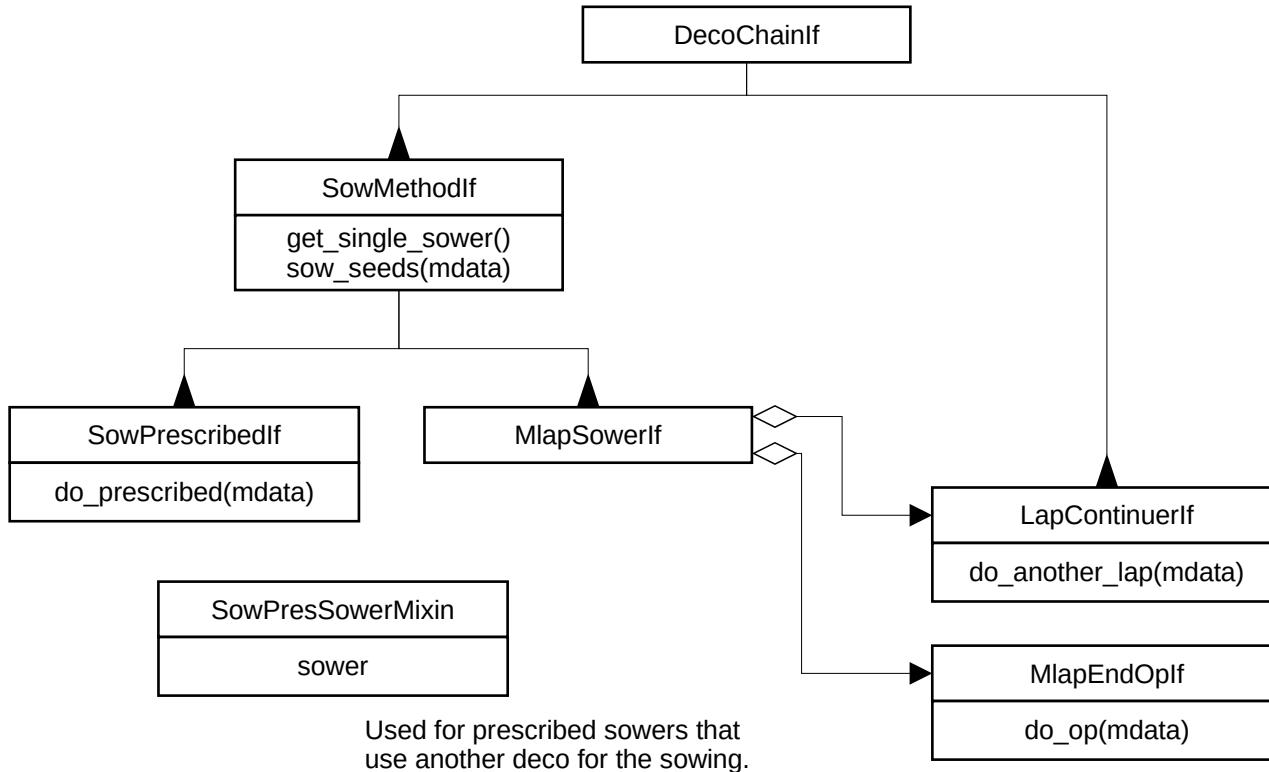


State variables:
 Read:
 turn
 Changed:
 board
 unlocked

Parameters:
 allow_rule
 mlength
 move_one
 moveunlock
 sow_start



Sower Decorators



State variables:

Reads
inhibitor
turn
child
mcount

Changes
board
store
blocked

Parameters:

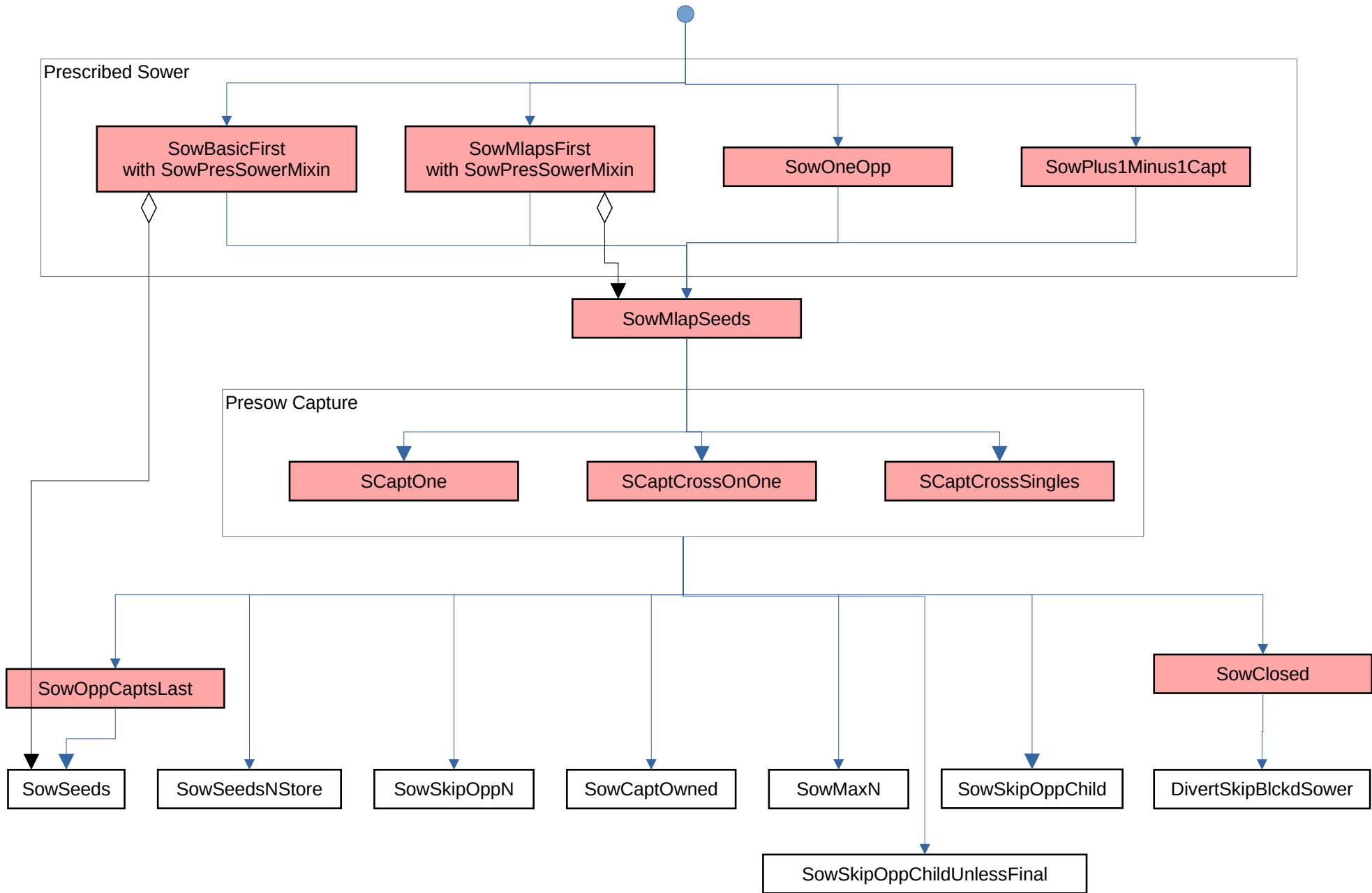
capt_max
capt_min
capt_on
child_type
crosscapt
evens
goal
gparam_one
mlaps
prescribed
presowcapt
sow_direct
sow_own_store
sow_param
sow_rule
visit_opp

Mlap Op

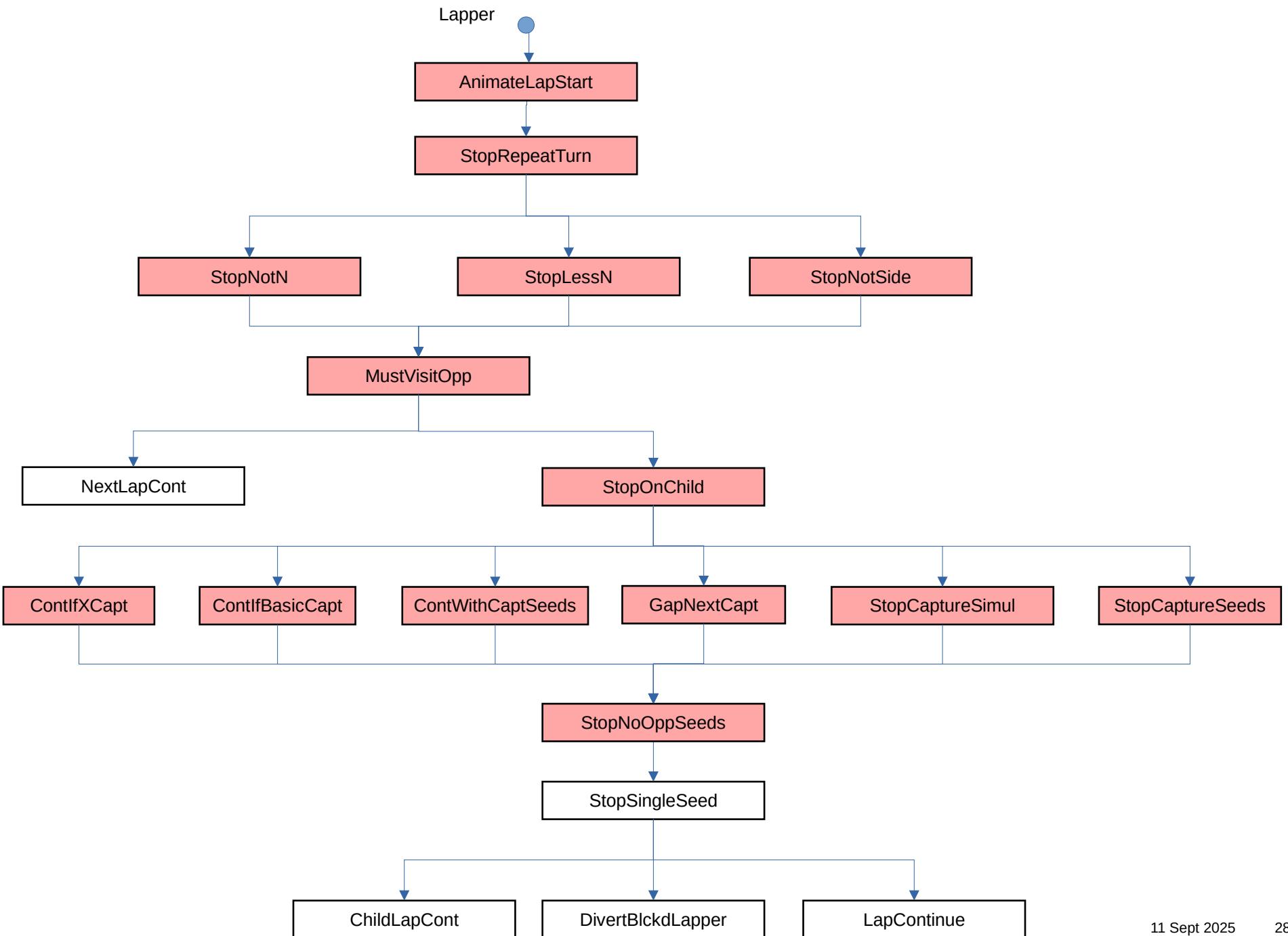
Not a deco chain.



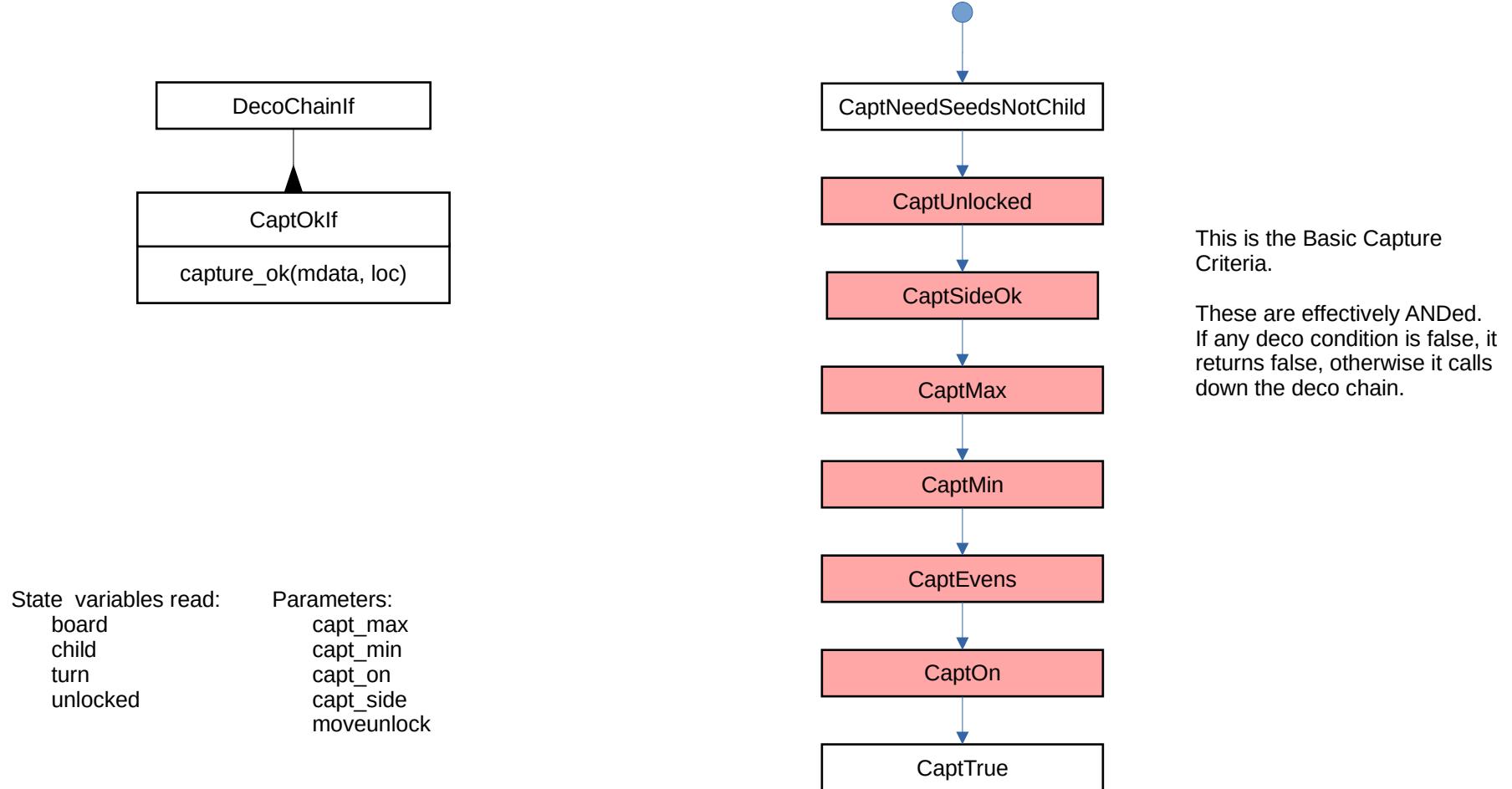
Sower Deco Chain



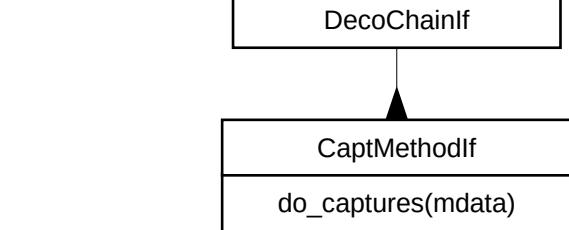
Lap Continuer Deco Chain and Mlap Operation



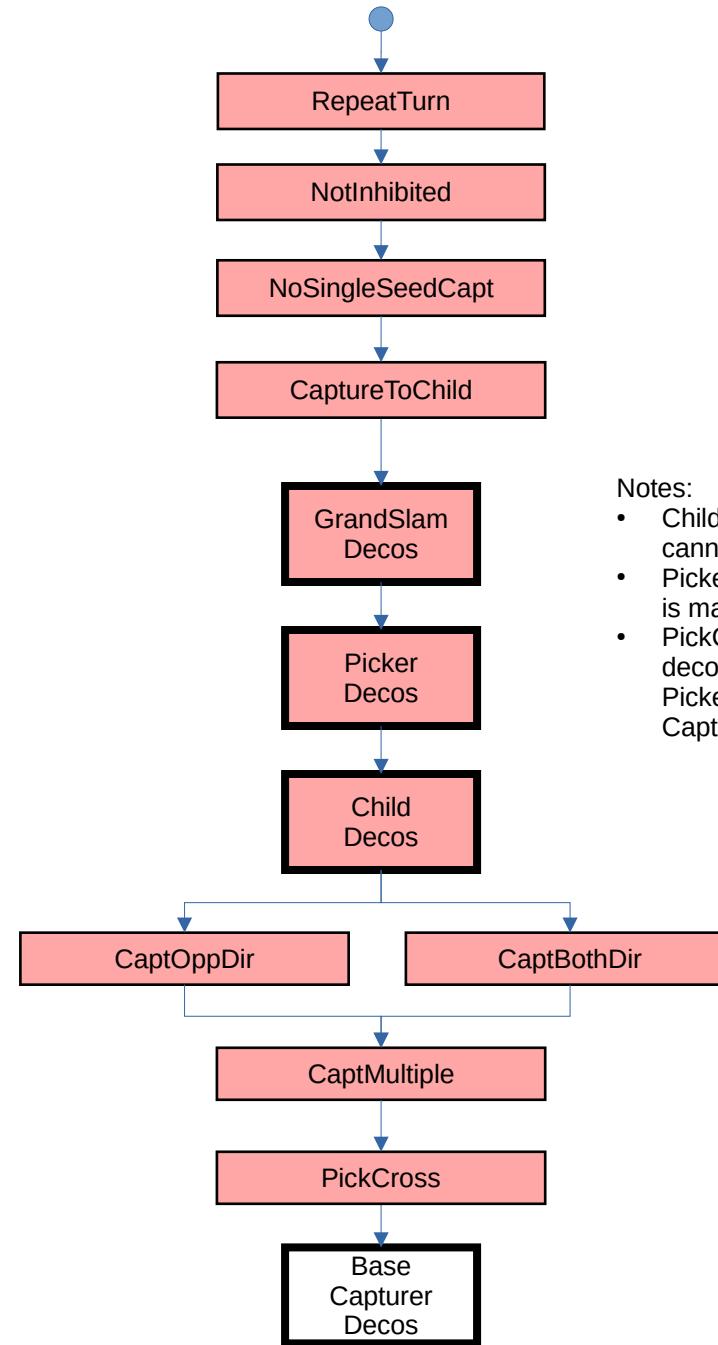
Capt Ok Decorators and Chains



Capturer Decorators and Chain



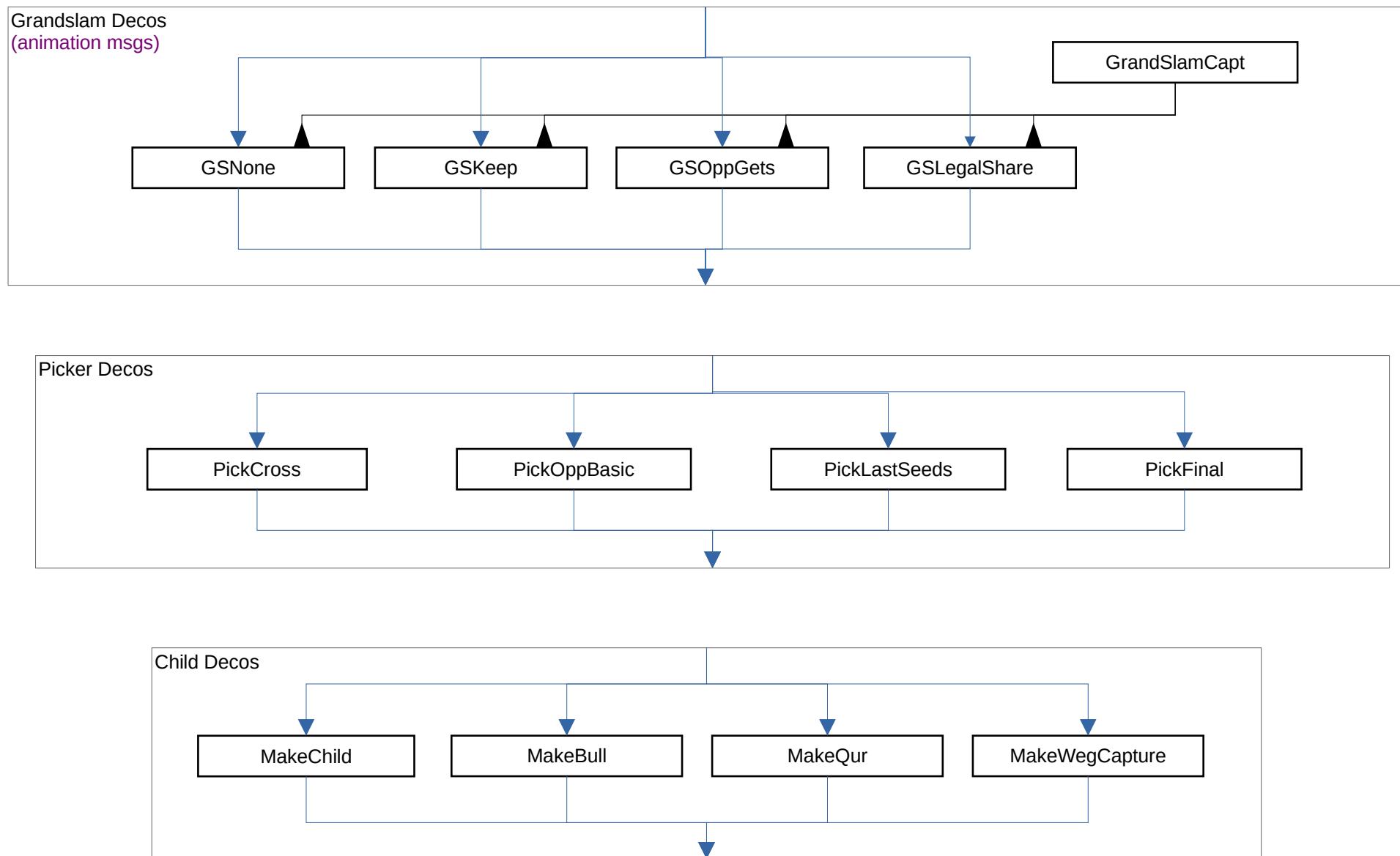
State variables	Parameters:
Reads	inhibitor starter turn board child store
Changes	capsamedir capt_max capt_min capt_on capt_rturn capt_side capt_type child_cvt child_type crosscapt evens grandslam mlaps multicapt nocaptmoves nosinglecapt pickextra prescribed round_fill xc_sown xcpickown



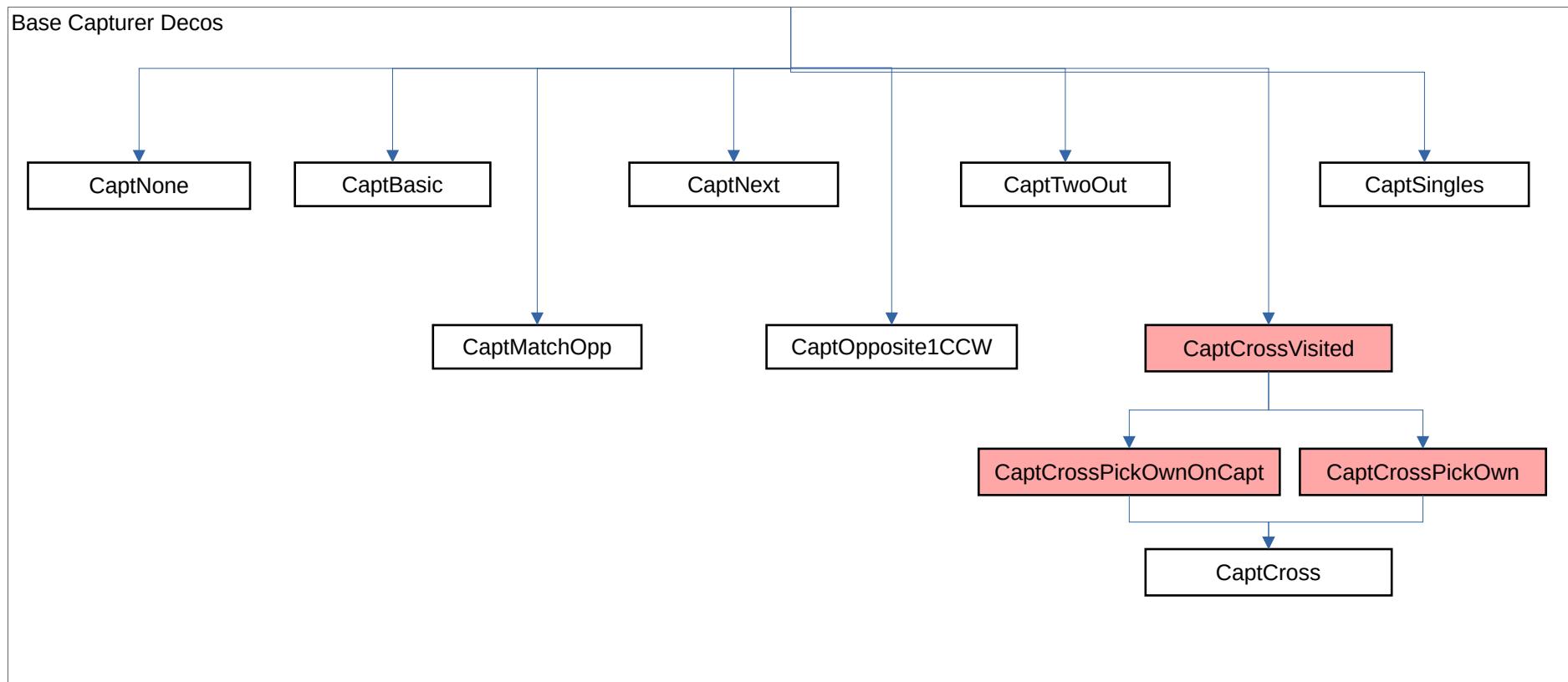
Notes:

- 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)



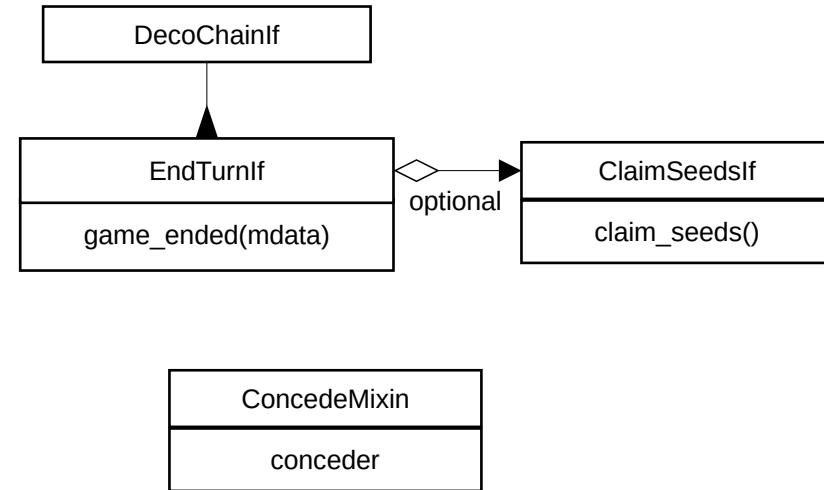
Ender & Quiter Decorators and Chains

State variables:

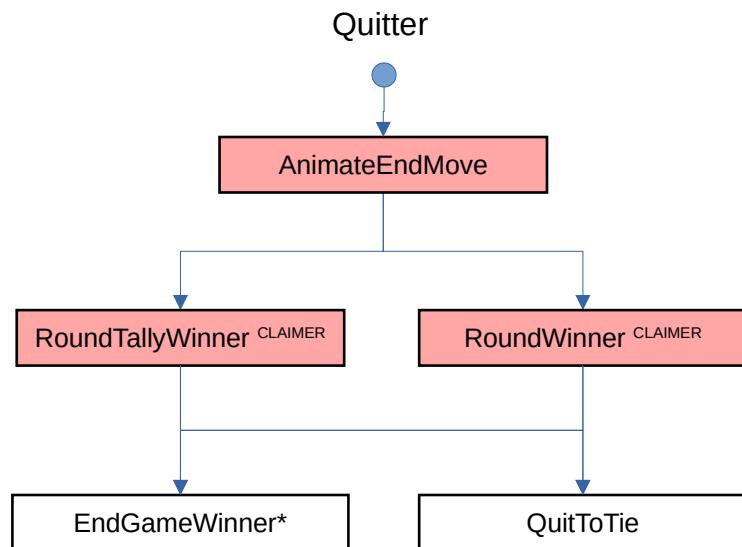
Reads:
 child
 owner
 turn
 Changes:
 board
 store

Parameters:

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



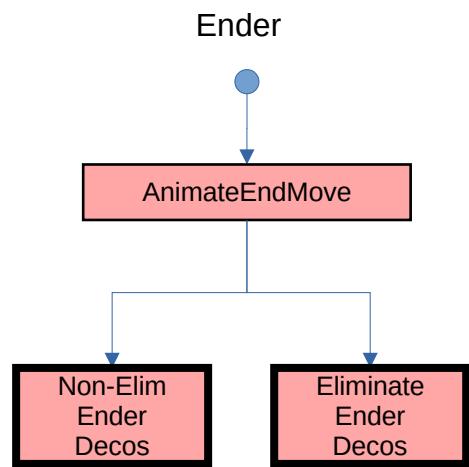
Used for enders that use a different criteria for ending when the user concedes a game.



Note:

* For `EndGameWinner` in the quitter: a claimer, taker or divvier is selected based on the quitter, `child_type` and `store` properties (see next page).

Ender Deco Chain



CLAIMER: counts owned seeds but does not move them:

- ClaimSeeds
- ChildClaimSeeds
- ClaimOwnSeeds
- ClaimBoardSeeds

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

- TakeOwnSeeds
- TakeOnlyChildNStores
- TakeAllUnclaimed

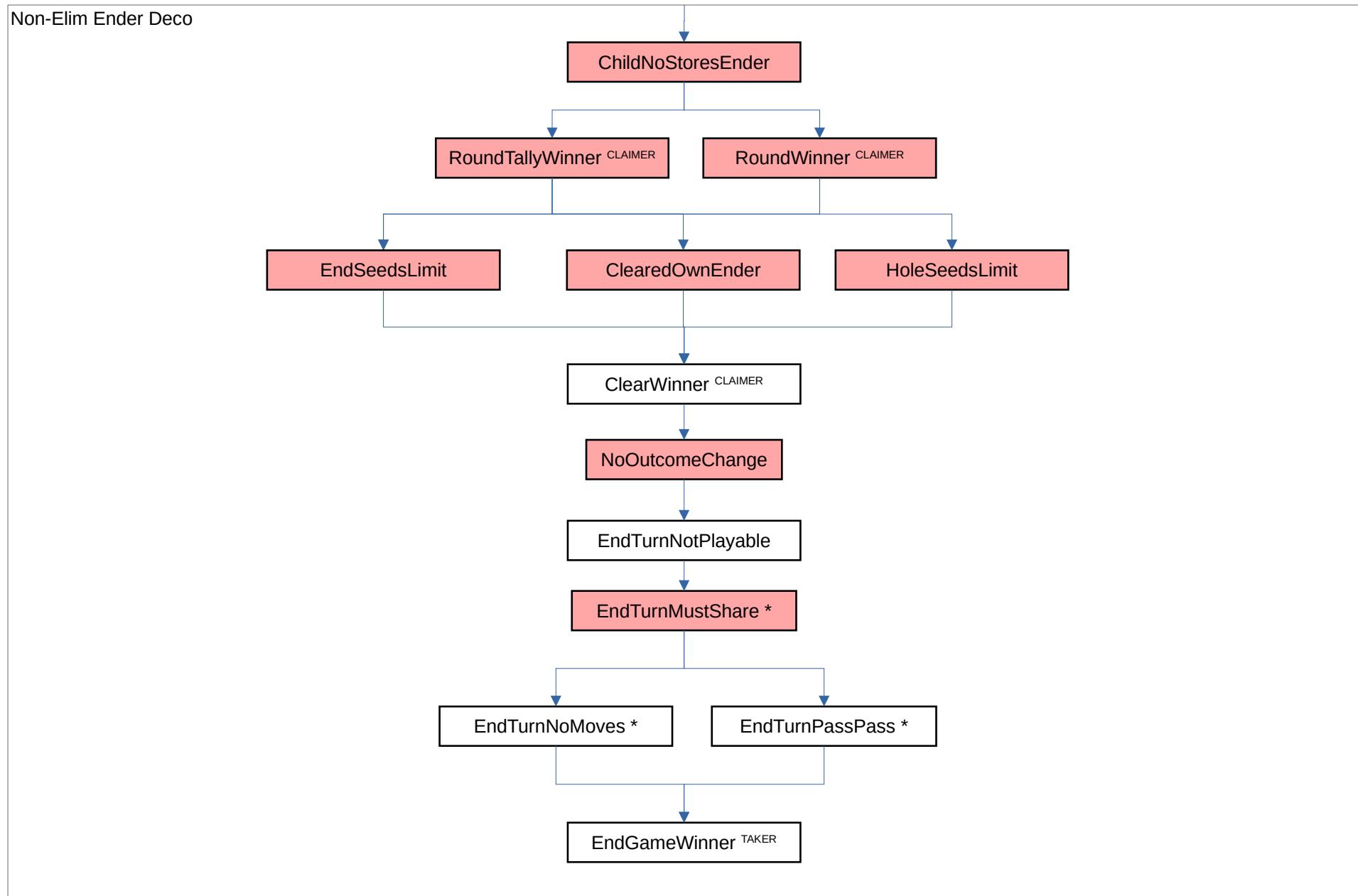
DIVVY: unclaimed seeds are split between players:

- DivvySeedsStores
- DivvySeedsChildOnly

Note:

- * Uses get_allowable_holes

Non-Eliminate Ender Deco Chain



Eliminate Ender Deco Chains

