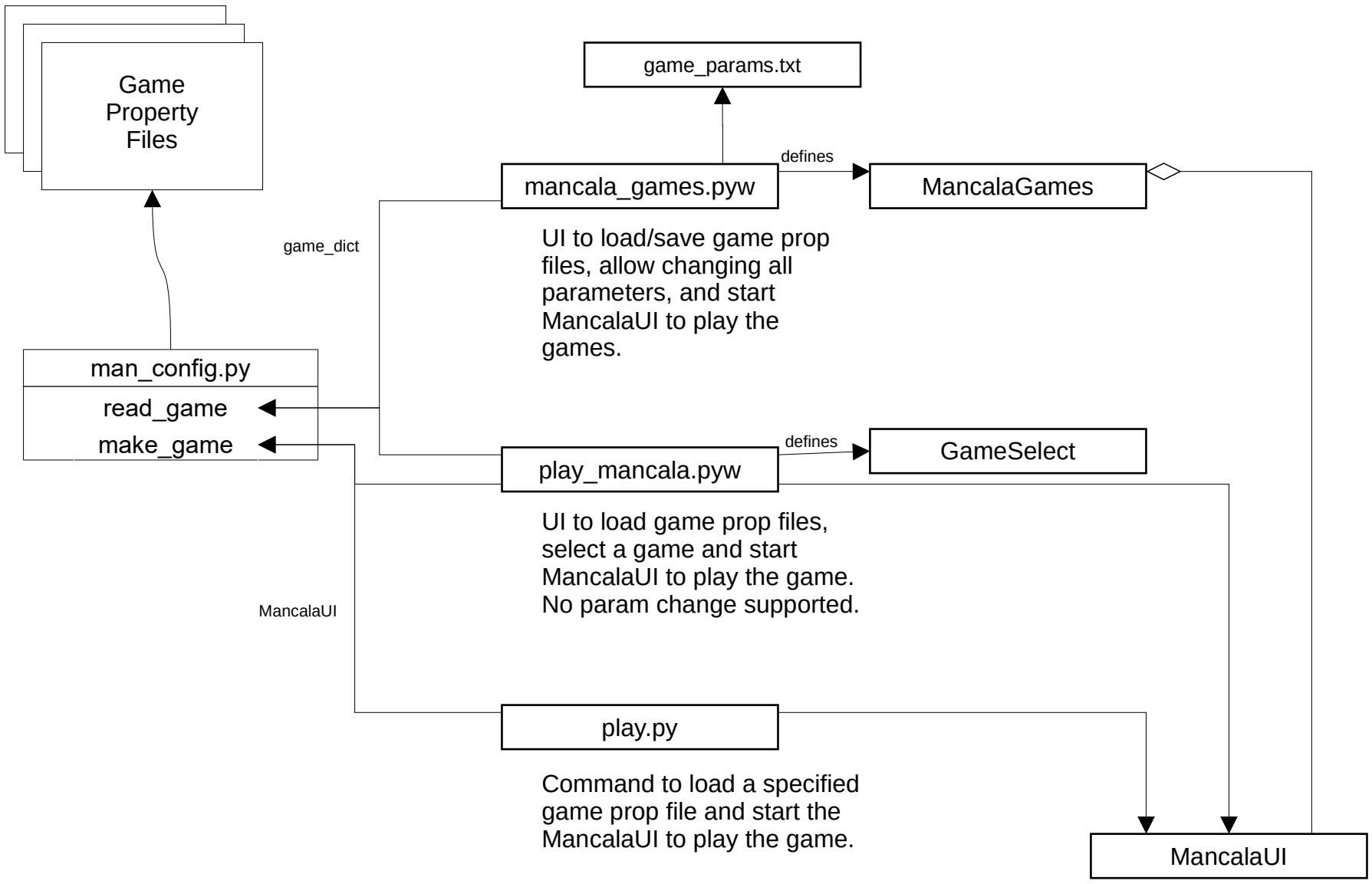
Mancala Games

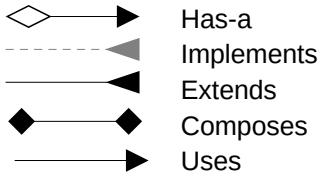


Notation Convensions

Class Diagram Convensions

Abstract Base Class

Primarily Data

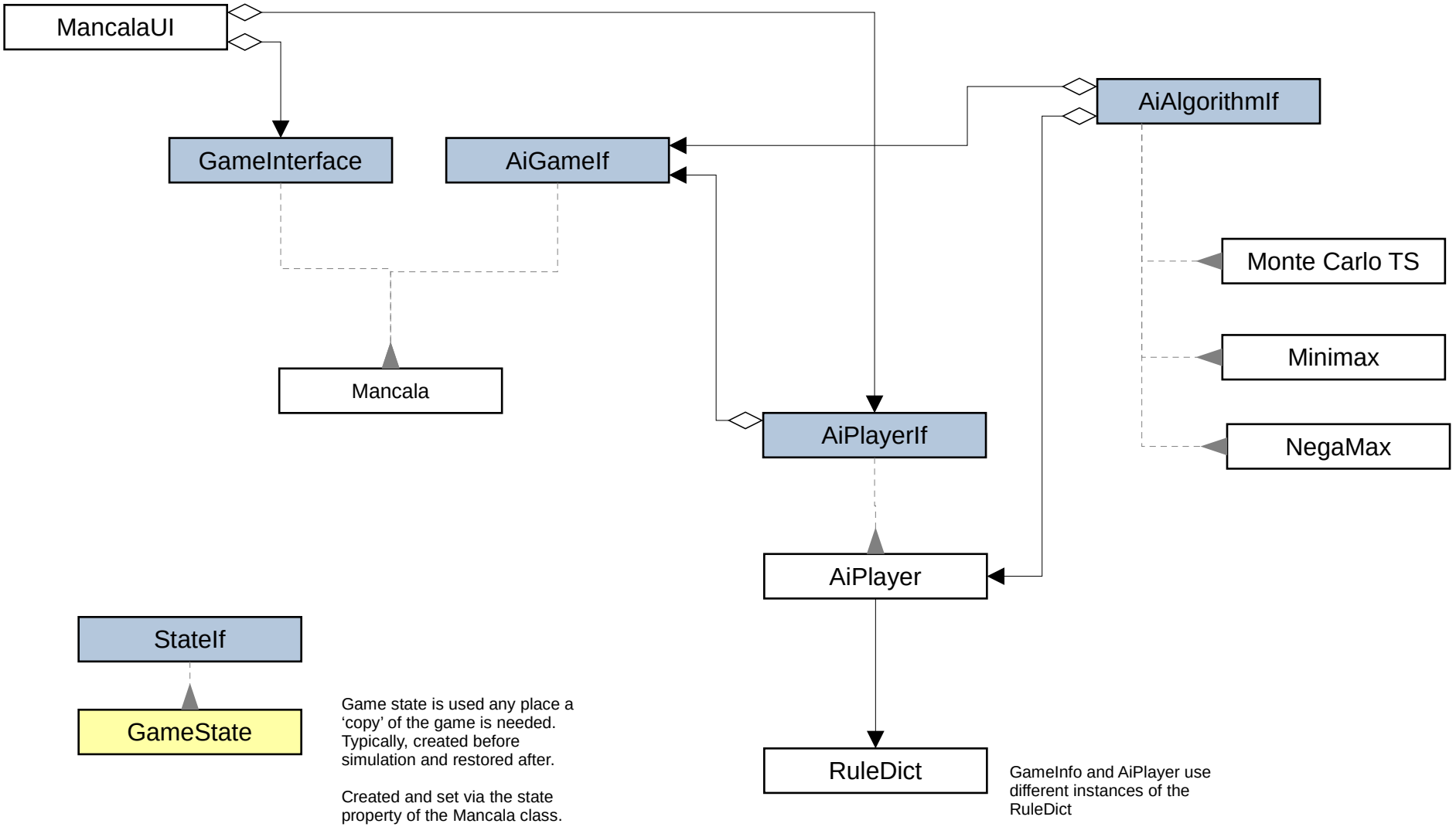


Deco Chain Convensions

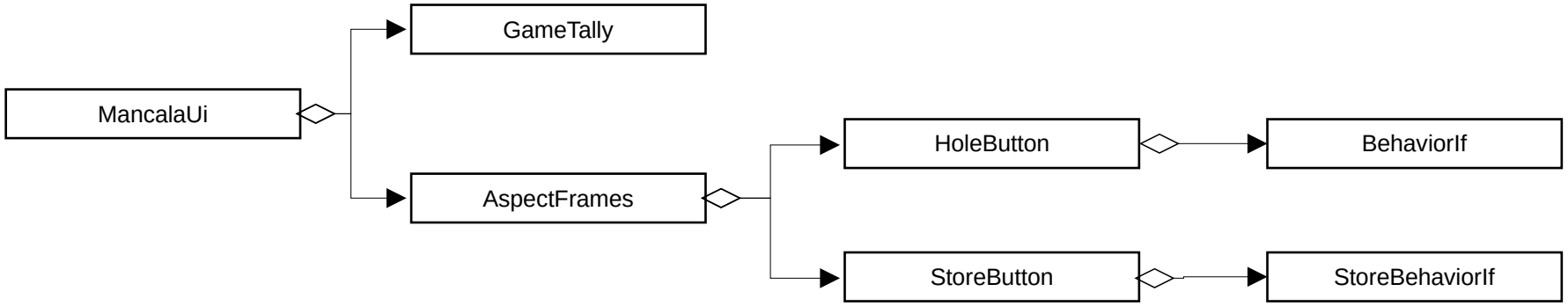
- One path down the deco chain is used.
- Intersecting arrows are decision points.
- Shown in **call order** from start dot (constructed in reverse order). Calls down the deco chain maybe at any point in a deco's processing.
- All paths shown might not be possible (see ginfo_rules).

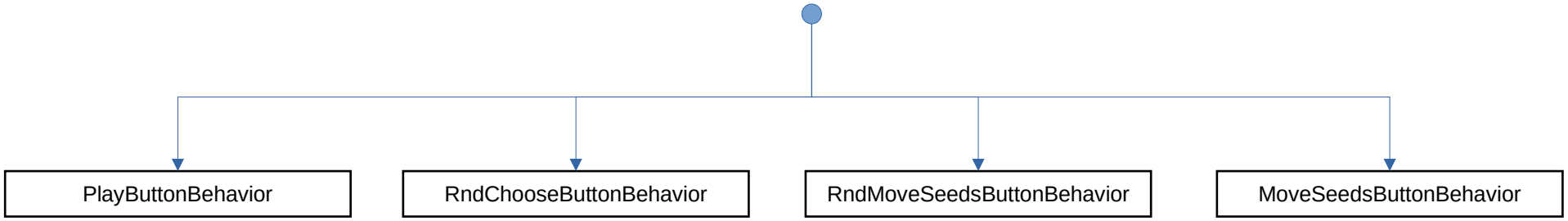
Optional deco

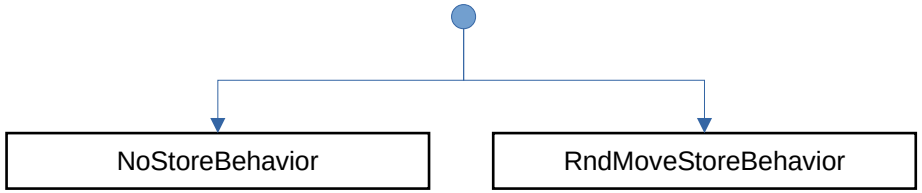
Mancala, GameState, AIPlayer and AIAlgorithm



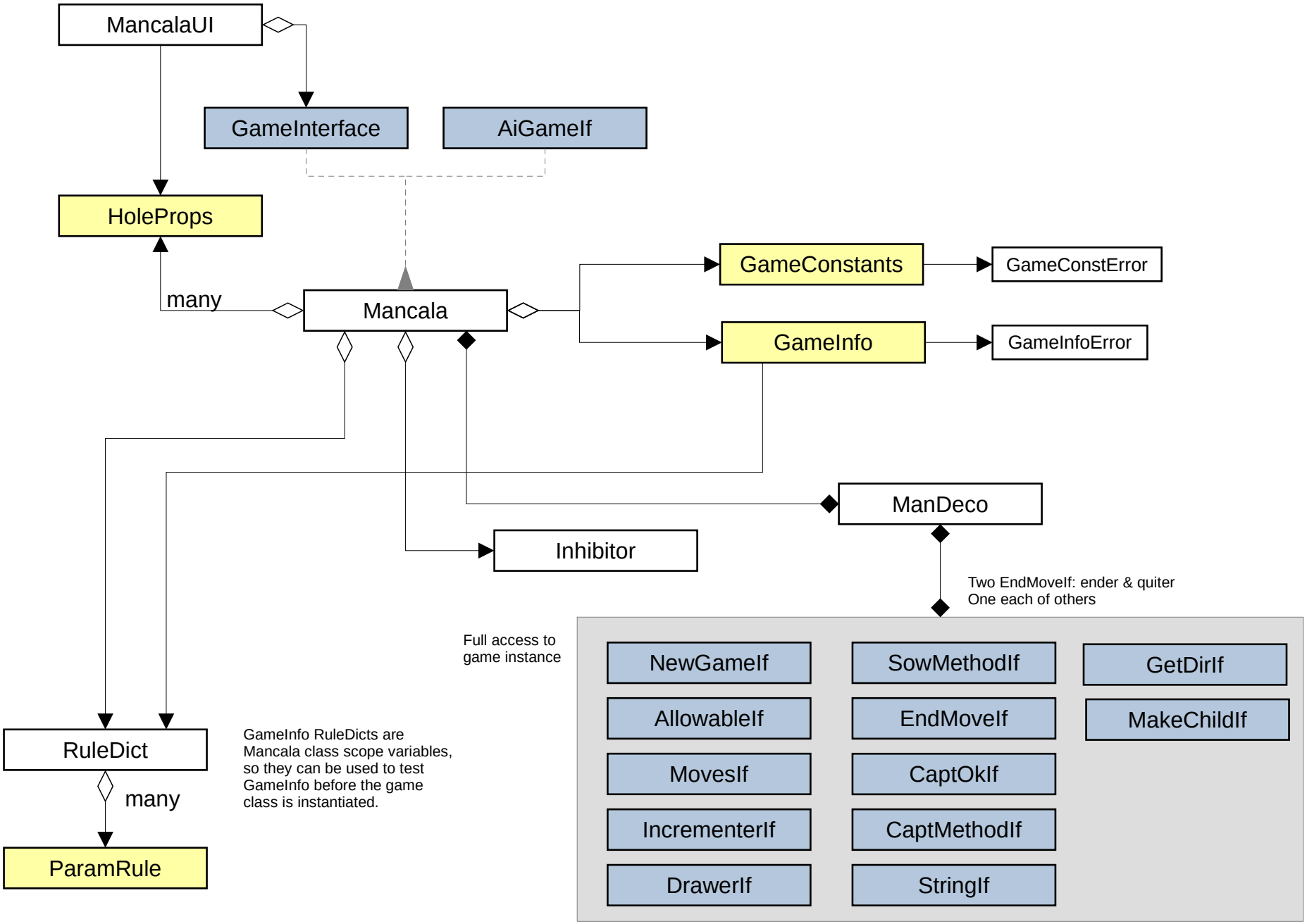
Mancala UI Classes







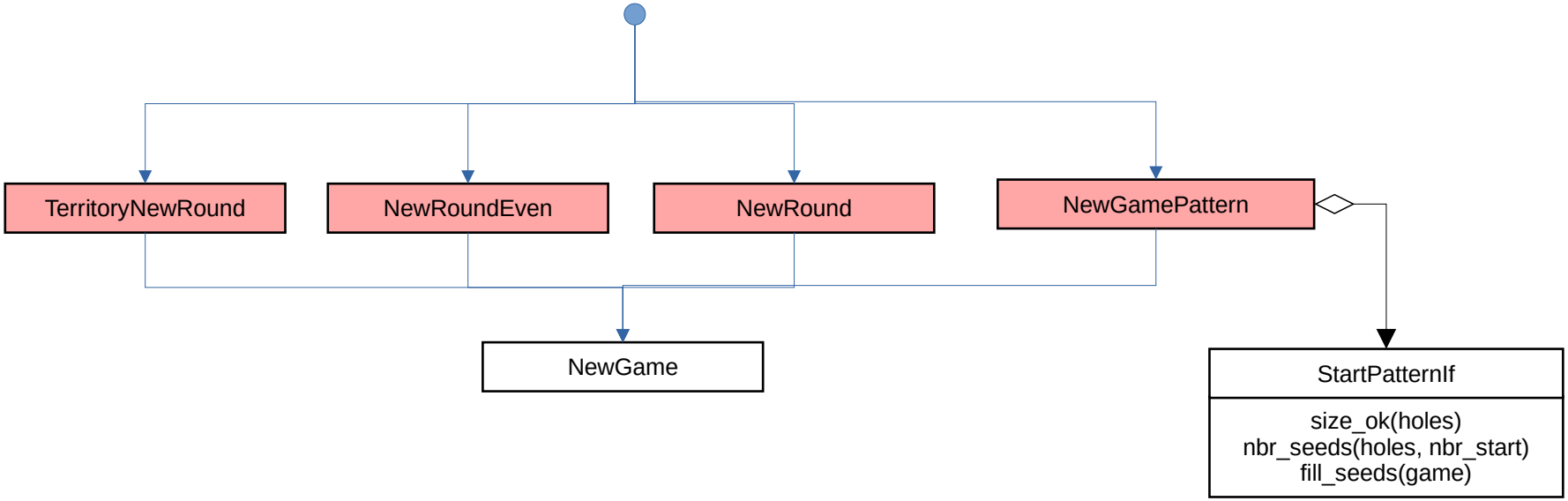
Mancala Classes



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	incr, make_child, inhibitor	Drop the seeds into the board holes.
Capture seeds	capturer & capt_ok	incr, make_child, inhibitor	Perform any captures.
Evaluate end of game	ender		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

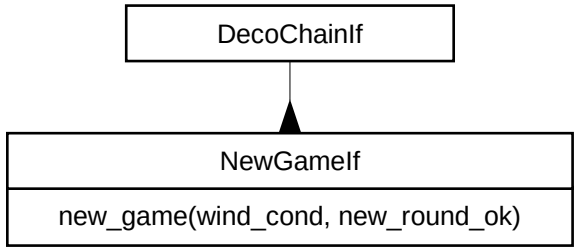


State variables changed:

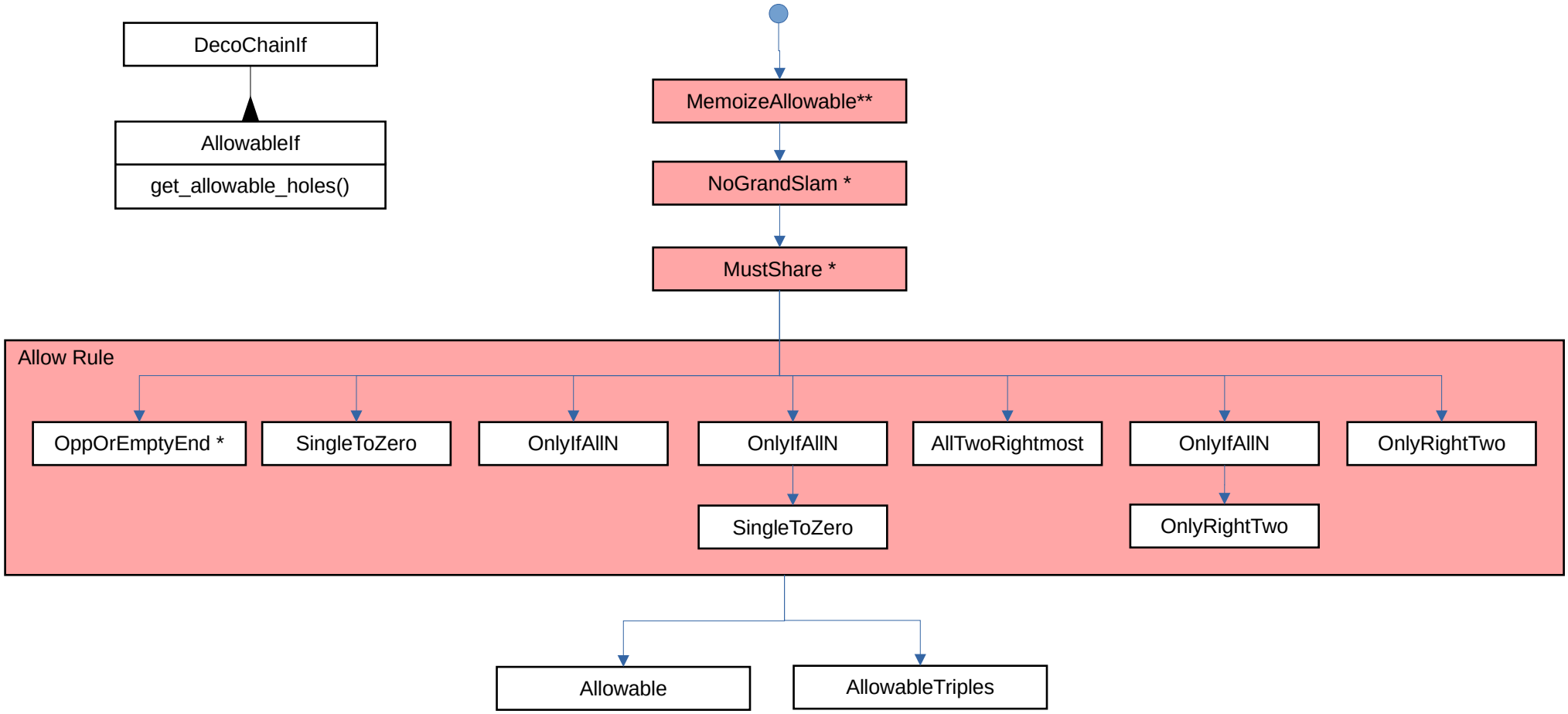
- blocked
- board
- owner
- starter
- store
- turn

Parameters:

- blocks
- goal
- min_move
- round_starter
- round_fill
- rounds
- start_pattern



Allowables Decorators and Chain

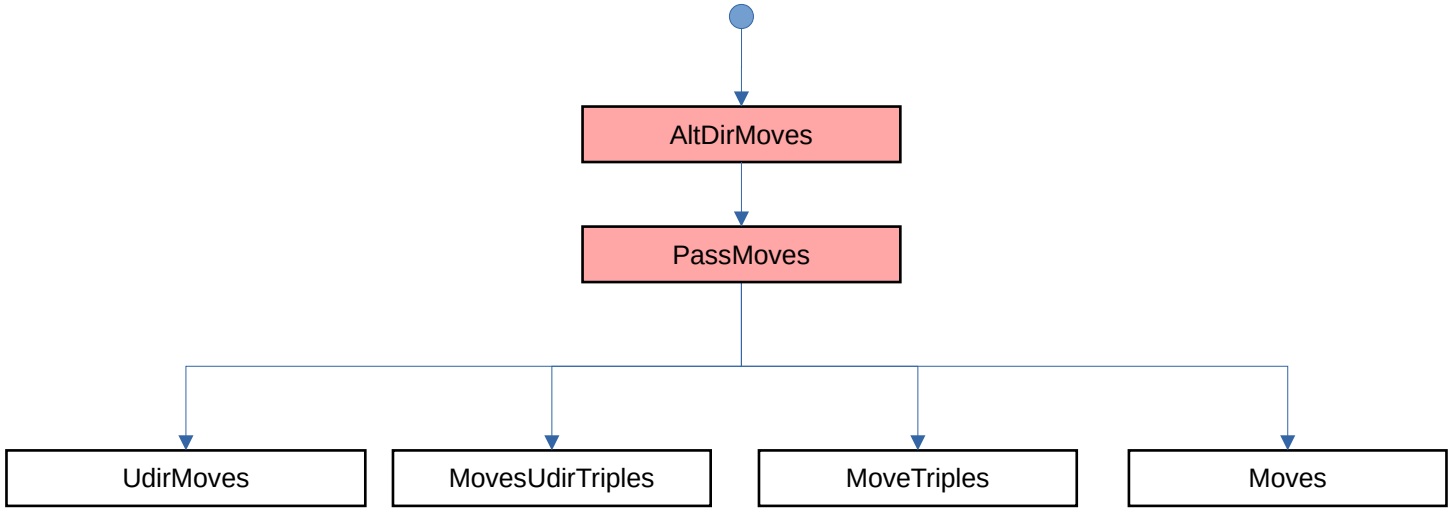


State variables read:
- turn
- board
- store
- blocked
- owner
- child
- mcount

Parameters:
- min_move
- allow_rule
- mlength
- mustshare
- grandslam

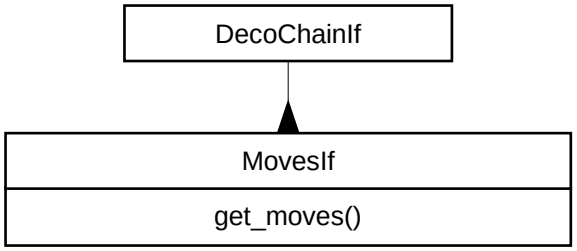
Notes:
Some allow rule decos are shown more than once for clarity.
* Simulates some portion of moves to determine allowables
** MemoizeAllowable is used for deco's that simulate moves

Get Moves Decorators and Chain

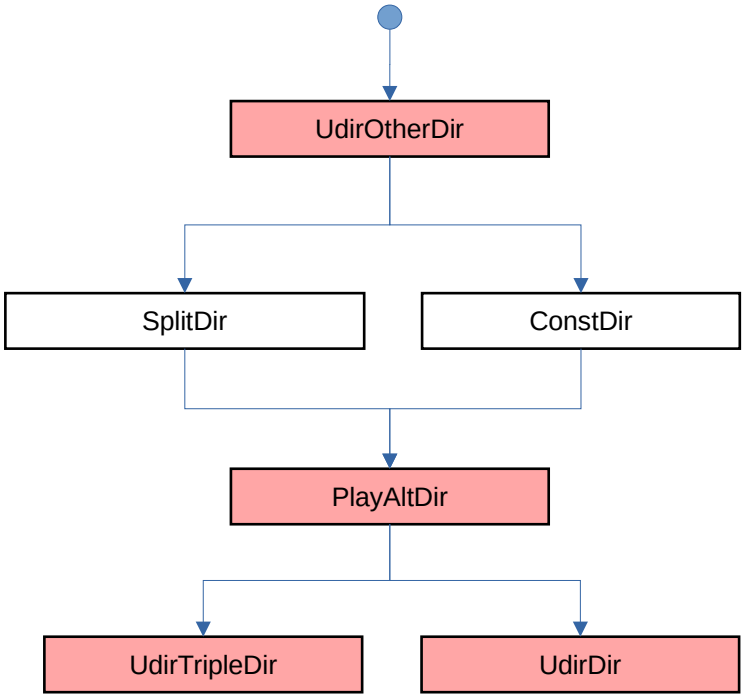


State variables read:
- blocked
- board
- owner
- starter
- store
- turn

Parameters:
- mlength
- mustpass
- sow_direct
- udir_holes
- udirect

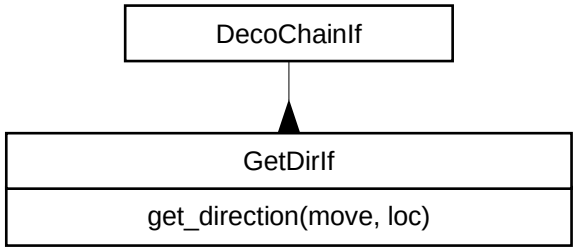


Get Direction Decorators and Chain

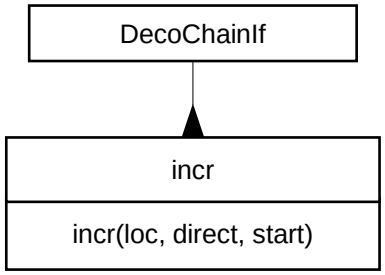


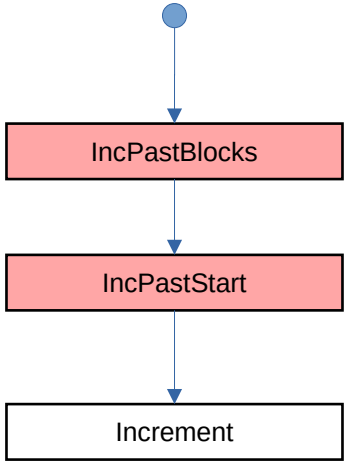
State variables read:
- mcount
- turn

Parameters:
- no_sides
- sow_direct
- udir_holes
- udirect



Incrementer Decorators and Chains





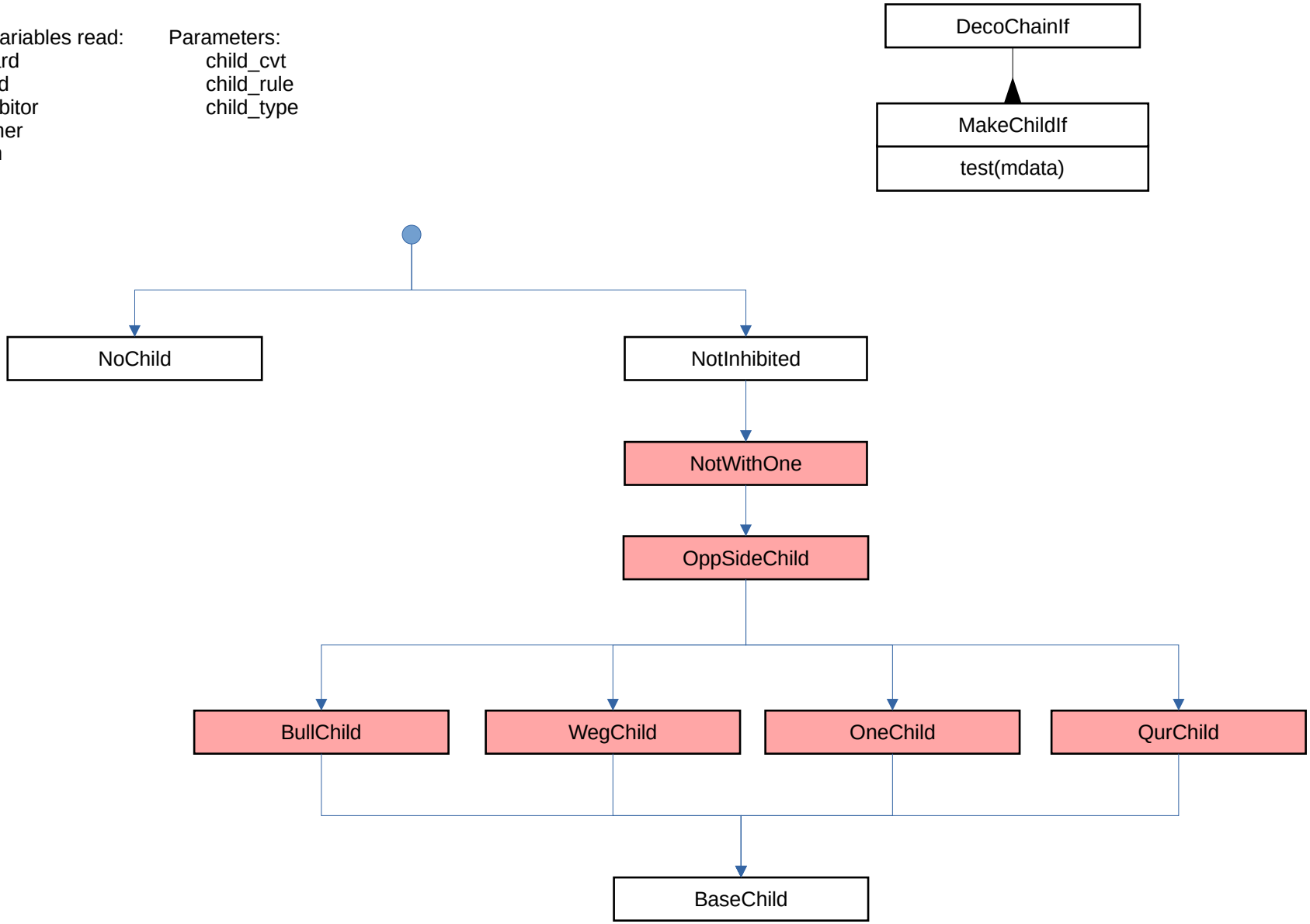
State variables read:
blocked

Parameters:
blocks
skip_start

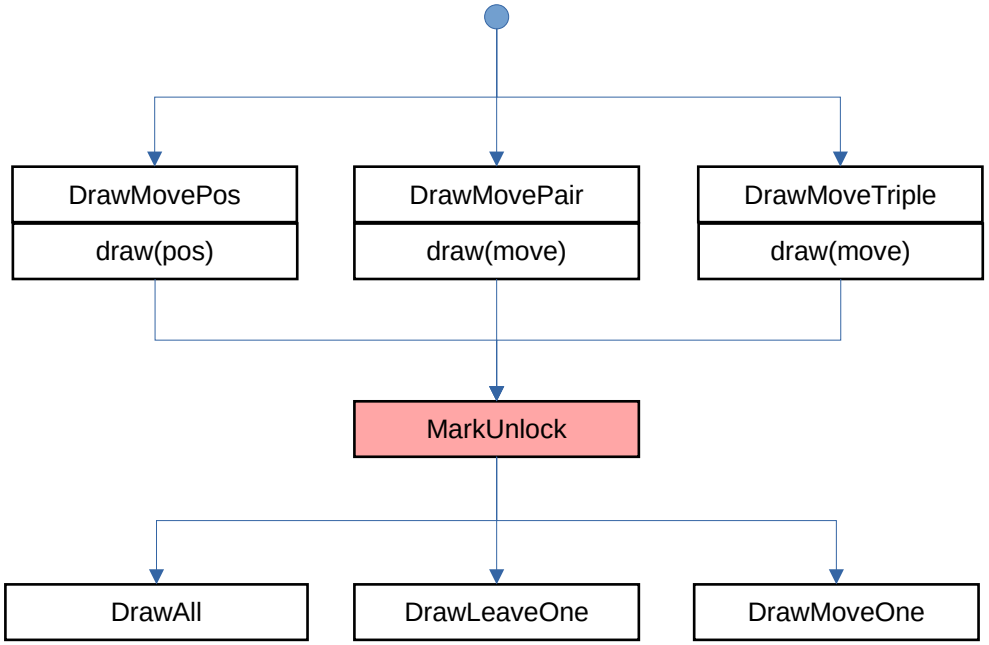
MakeChild Decorator and Chain

State variables read:
- board
- child
- inhibitor
- owner
- turn

Parameters:
- child_cvt
- child_rule
- child_type



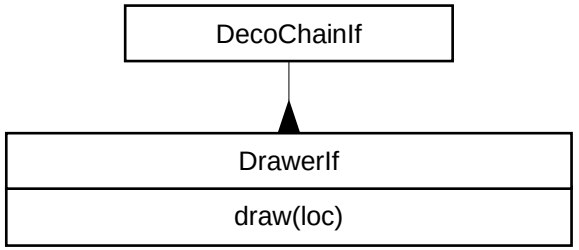
Draw Decorators and Chain



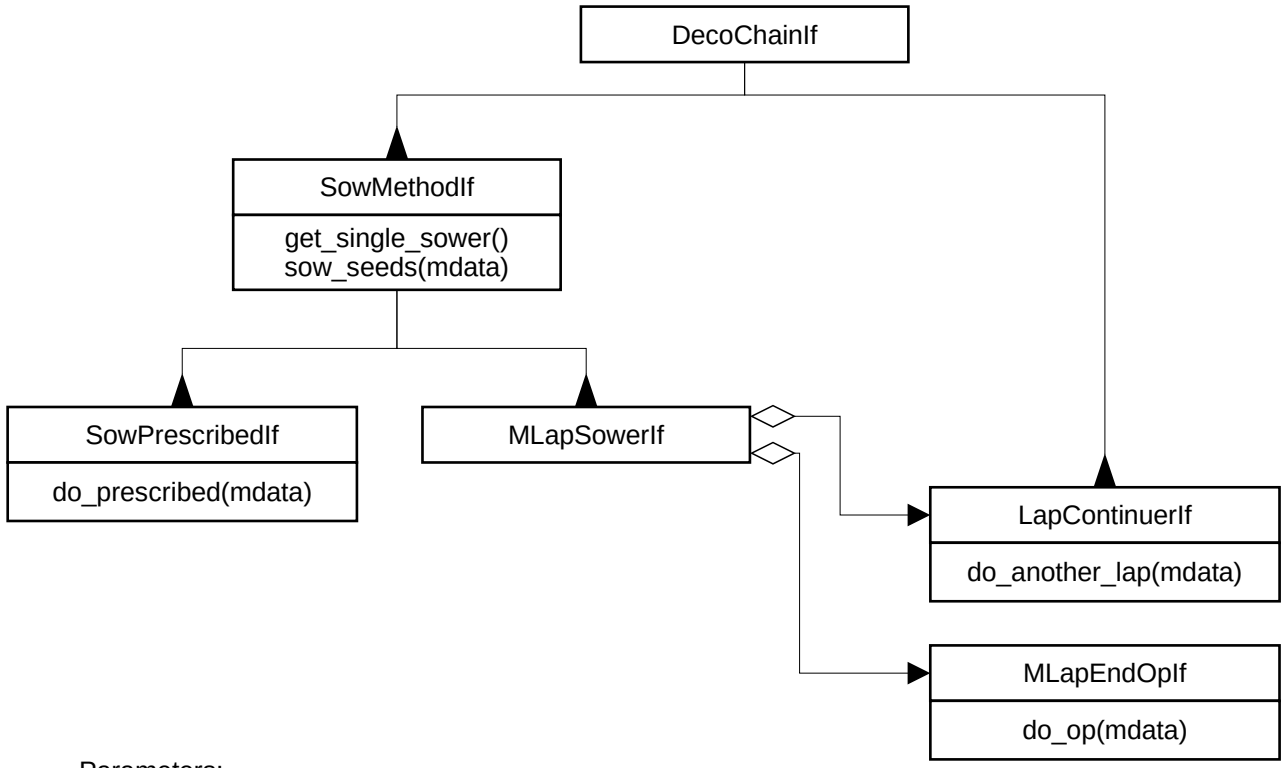
The first drawer converts the move into board location.

State variables:
- Read:
  - turn
- Changed:
  - board
  - unlocked

Parameters:
- mlength
- move_one
- moveunlock
- sow_start



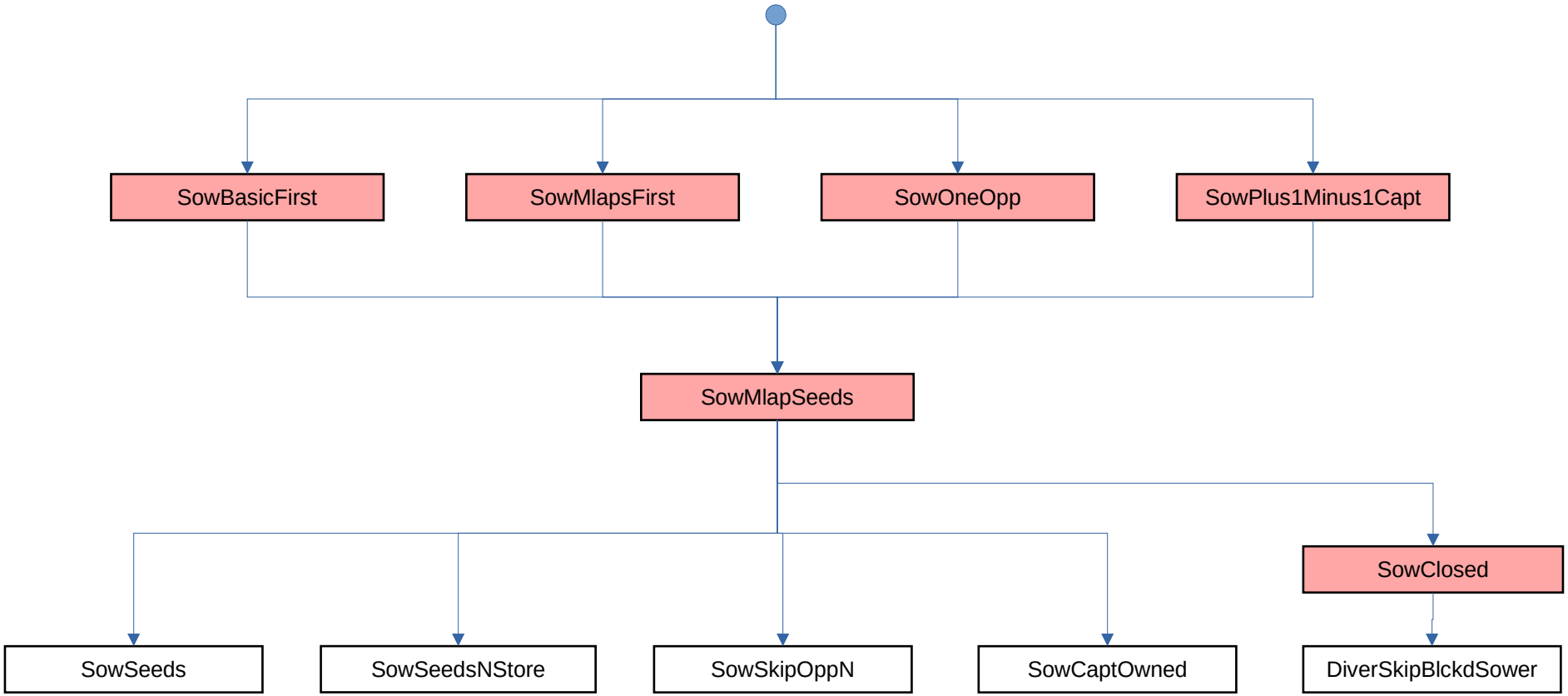
Sower Decorators



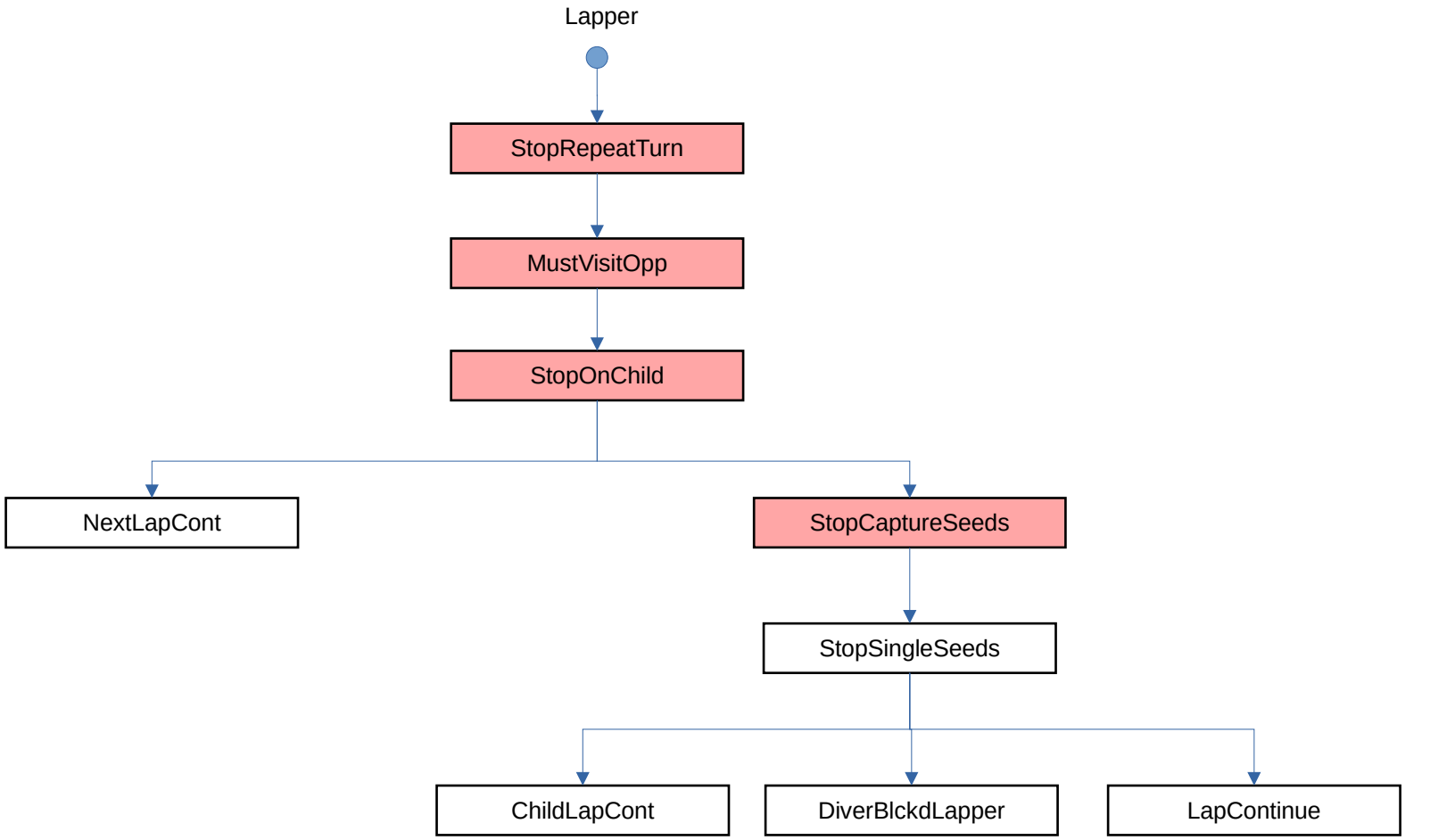
State variables:
- Reads
  - inhibitor
  - turn
  - child
  - mcount
- Changes
  - board
  - store
  - blocked

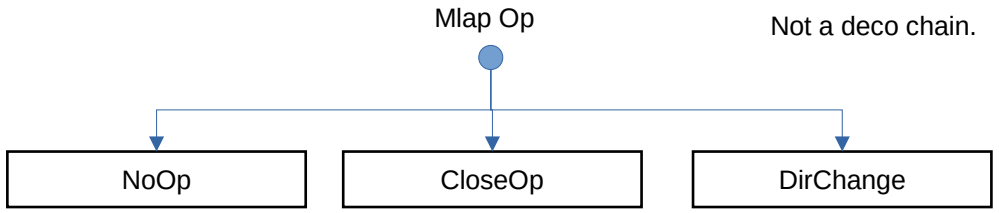
Parameters:
- capt_max
- capt_min
- capt_on
- child_type
- crosscapt
- evens
- goal
- gparam_one
- mlaps
- prescribed
- sow_direct
- sow_own_store
- sow_rule
- visit_opp

Sower Deco Chain

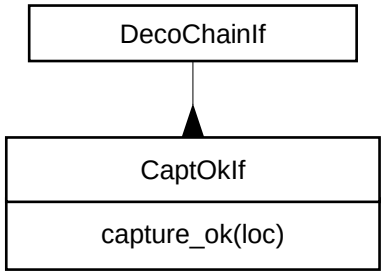


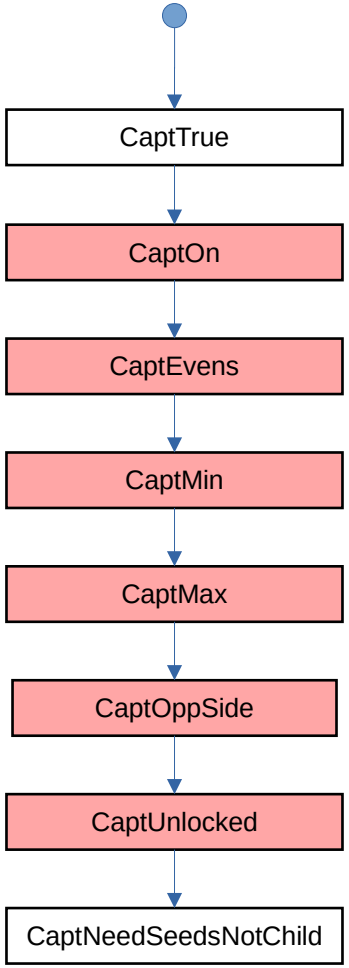
Lap Continuer Deco Chain and Mlap Operation





Capt Ok Decorators and Chains





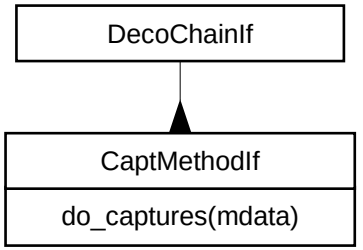
State variables read:
- board
- child
- turn
- unlocked

Parameters:
- capt_max
- capt_min
- capt_on
- moveunlock
- oppsidecapt

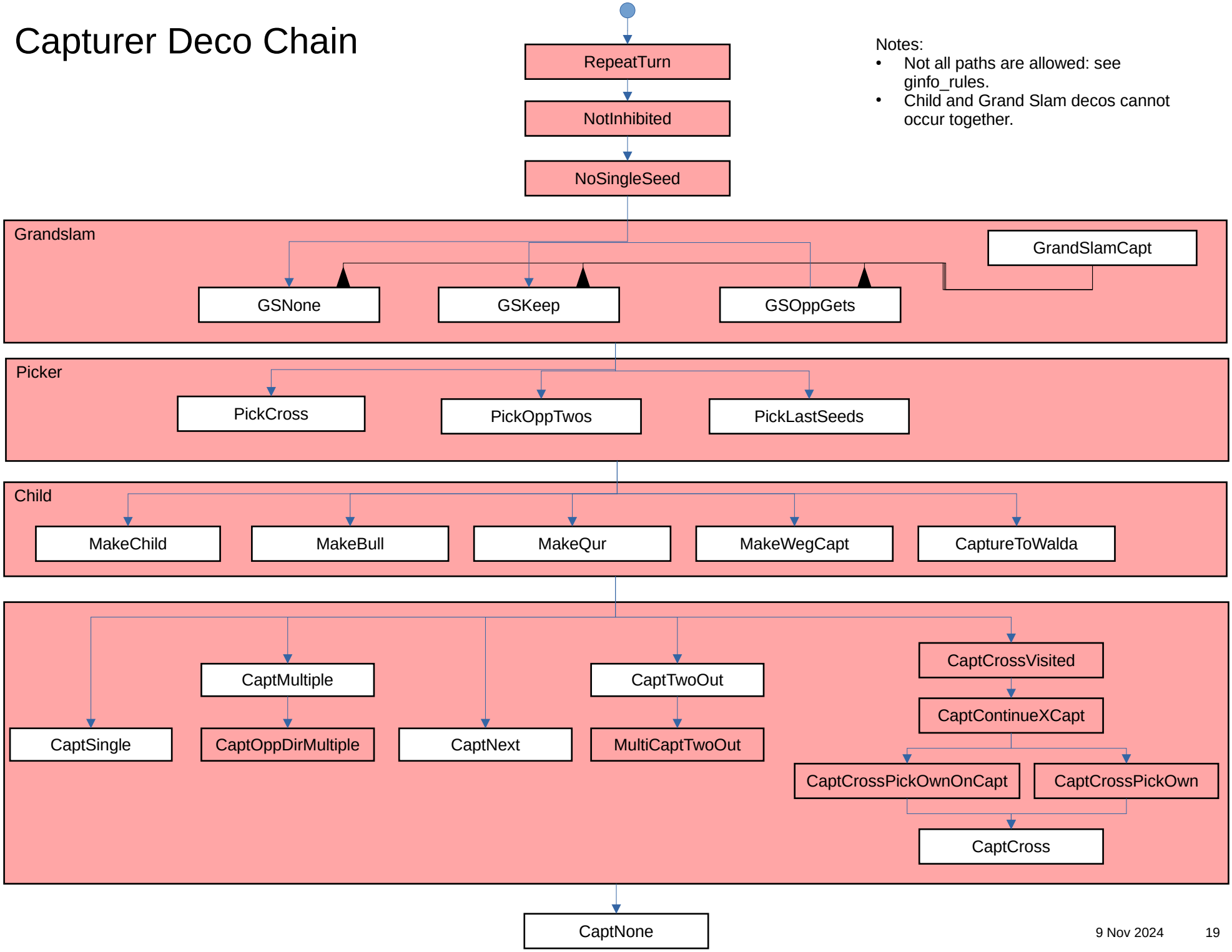
Capturer Decorators

State variables
- Reads
  - inhibitor
  - starter
  - turn
- Changes
  - board
  - child
  - store

Parameters:
- capsamedir
- capt_max
- capt_min
- capt_next
- capt_on
- capt_rturn
- capttwoout
- child_cvt
- child_type
- crosscapt
- evens
- grandslam
- mlaps
- multicapt
- nocaptfirst
- nosinglecapt
- oppsidecapt
- pickextra
- prescribed
- round_fill
- xc_sown
- xcpickown



Capturer Deco Chain



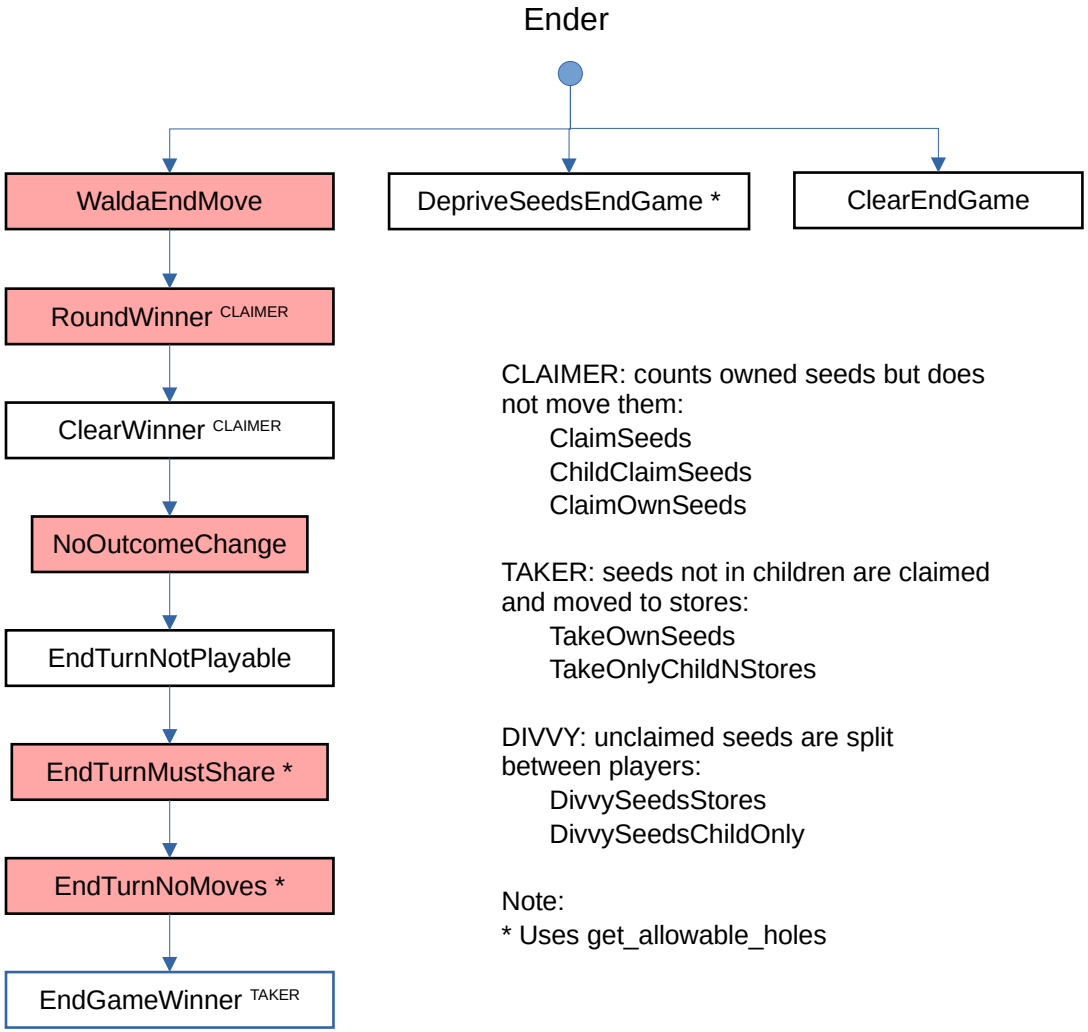
Notes:

- Not all paths are allowed: see ginfo_rules.
- Child and Grand Slam decos cannot occur together.

Ender & Quiter Decorators and Chains

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



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

DIVVY: unclaimed seeds are split between players:
- DivvySeedsStores
- DivvySeedsChildOnly

Note:
* Uses get_allowable_holes