# Bandit Game

## Dexter’s LabRats

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# Slot Machines in reality!

**Return to Player Ratio**

**(RTP)**

A slot with an RTP value of 96% means for every $100 that the player wagers, the machine pays back $96 **over a period of time!**

# An approach to never lose!*

**Martingale Betting System**

**The idea is that if you keep doubling your bet after each loss, eventually you'll earn back your money!**

*Considering you have infinite money!

# Casino

1. Initially, pick a random slot as special slot.
2. Record player_wins, player_loss, player_switch
3. *Check at interval of 25s*:

    *Min No of Pulls possible = 500s/3*

    *Max pulls = s/7*

    *Avg no of pulls per switch = 500s/(7*3) ~ 25s*

    If *player_wins > 55%* and *30% > player_switch > 70%*
        => switch Special Slot

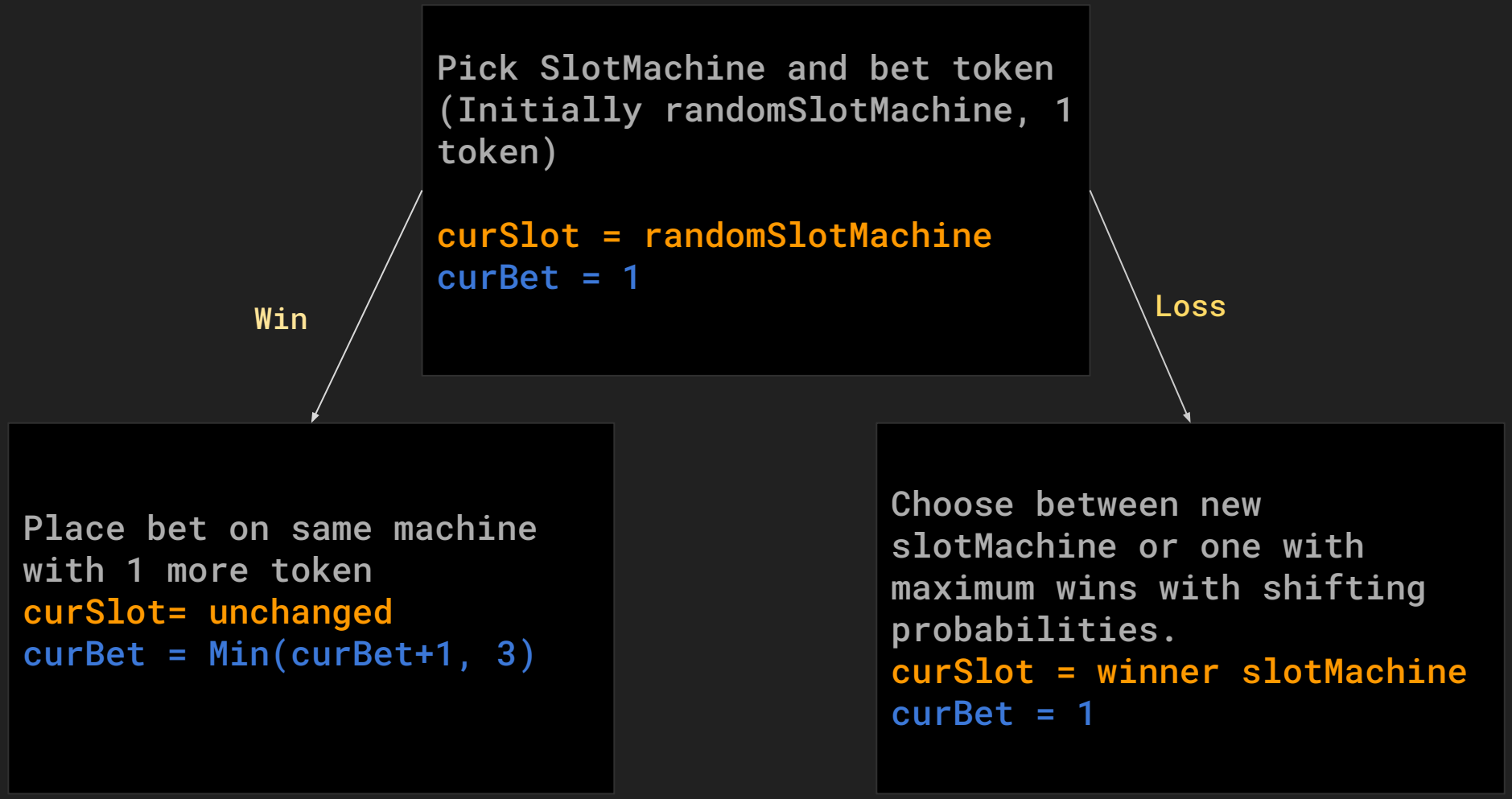
    else
        => continue to next 25s interval

# Player

1. Start with random
2. If you win, bet 1 more token than previous round on the same slot machine
3. If you lose, switch the slot machine and bet 1 token.

   *Switching Slot Machine: As the game proceeds, we increase the probability of choosing among slot machines that has given maximum gains so far, keeping deviation of the wins in mind.*

4. *Loss Threshold* = 0.9 * initial player wealth, *Win Threshold* = 1.1 * initial player wealth
5. Quit if Win/Loss threshold is met, no more tokens left to play or no more pulls left


Pick SlotMachine and bet token (Initially randomSlotMachine, 1 token)
curSlot = randomSlotMachine
curBet = 1
Win
Loss
Place bet on same machine with 1 more token
curSlot= unchanged
curBet = Min(curBet+1, 3)
Choose between new slotMachine or one with maximum wins with shifting probabilities.
curSlot = winner slotMachine
curBet = 1