

Lab08 – Design Sharing

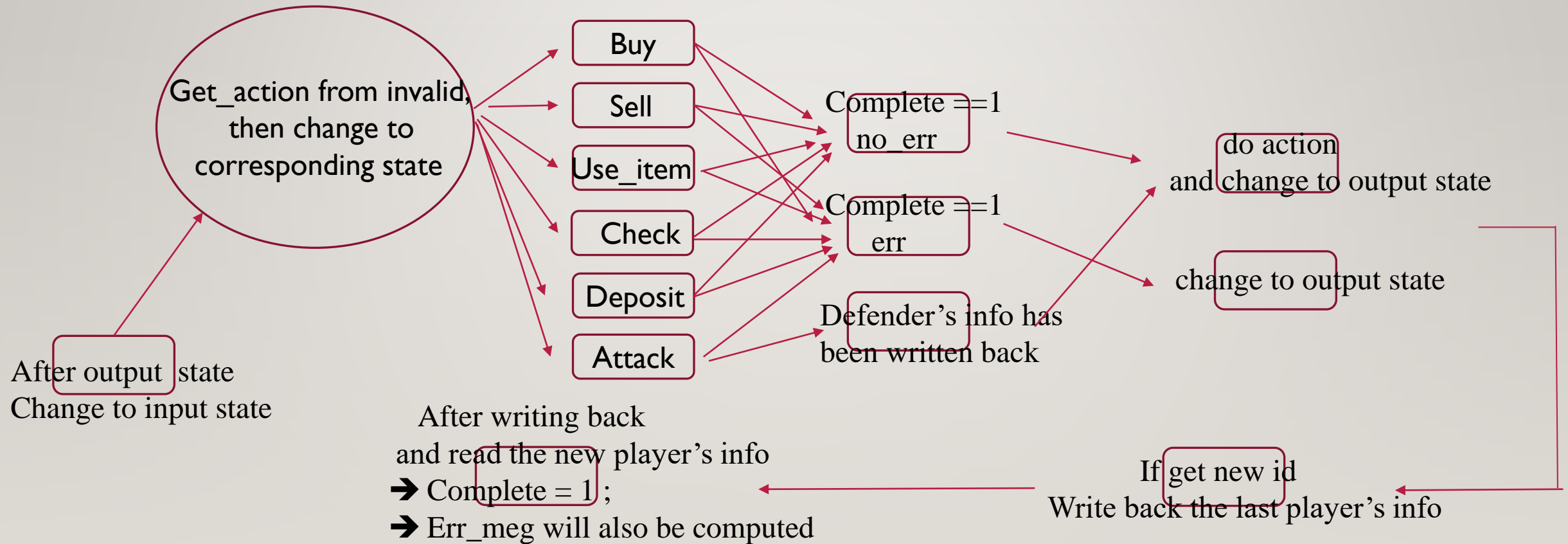
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Outline

- Algorithm
- Reduce cycles
- Reduce area

Algorithm



Reduce Cycles

- When change player
- When Attack

When change player

- 1. Write back the last player.
- 2. After writing back the info, read the new player's info.

When Attack

- If the player does not have a pokemon (err_msg)
 - ➔ we don't need to get the defender's info.

Reduce Area

- Extract parameters to implement in different situations

Extract Parameters

```
always_comb begin
    // Highest stage hp          // middle stage evolution hp          // middle stage evolution hp
    if ((MY_Pok.stage == Highest) || ((MY_Pok.stage == Middle) && Current_state == ST_ATTACK) || (Cur_item == Candy && Current_state == ST_USE_ITEM && MY_Pok.stage == Middle )) begin
        if (MY_Pok.pkm_type == Grass) begin
            Full_HP = 'd254;
        end else if (MY_Pok.pkm_type == Fire) begin
            Full_HP = 'd225;
        end else if (MY_Pok.pkm_type == Water) begin
            Full_HP = 'd245;
        end else begin // if (MY_Pok.pkm_type == Electric) begin
            Full_HP = 'd235;
        end
    end else if (MY_Pok.stage == Middle || ((MY_Pok.stage == Lowest) && Current_state == ST_ATTACK) || (Cur_item == Candy && Current_state == ST_USE_ITEM && MY_Pok.stage == Lowest )) begin
        if (MY_Pok.pkm_type == Grass) begin
            Full_HP = 'd192;
        end else if (MY_Pok.pkm_type == Fire) begin
            Full_HP = 'd177;
        end else if (MY_Pok.pkm_type == Water) begin
            Full_HP = 'd187;
        end else begin // if (MY_Pok.pkm_type == Electric) begin
            Full_HP = 'd182;
        end
    end else begin // (MY_Pok.stage == Lowest) begin
        if (MY_Pok.pkm_type == Grass) begin
            Full_HP = 'd128;
        end else if (MY_Pok.pkm_type == Fire) begin
            Full_HP = 'd119;
        end else if (MY_Pok.pkm_type == Water) begin
            Full_HP = 'd125;
        end else if (MY_Pok.pkm_type == Electric) begin
            Full_HP = 'd122;
        end else begin //if (MY_Pok.pkm_type == Normal) begin
            Full_HP = 'd124;
        end
    end
end
end
```

```
end else if ( Current_state == ST_ATTACK) begin
    if (inf.complete == 'd1 && inf.err_msg == 'd0 ) begin
        if (bracer_used)
            MY_Pok.atk <= MY_Pok.atk - 'd32 ;

        if ( MY_Pok.exp + EXP_gain_from_attack >= Full_EXP )begin
            if (MY_Pok.pkm_type == Normal)begin

                MY_Pok.exp <= 'd29 ;
            end else begin
                MY_Pok.exp <= 'd0 ;
                MY_Pok.hp <= Full_HP ;
                MY_Pok.atk <= evolution_atk_for_my ;
                if (MY_Pok.stage == Lowest) begin
                    MY_Pok.stage <= Middle ;
                end else begin
                    MY_Pok.stage <= Highest ;
                end
            end
        end
    end else begin
        if (MY_Pok.stage != Highest)
            MY_Pok.exp <= MY_Pok.exp + EXP_gain_from_attack ;
        end
    end
end
```


Other Examples

```
always_comb begin
    if (Def_Pok.stage == Lowest) begin
        if (Def_Pok.pkm_type == Grass) begin
            Full_EXP_for_defend = 'd32;
        end else if (Def_Pok.pkm_type == Fire) begin
            Full_EXP_for_defend = 'd30;
        end else if (Def_Pok.pkm_type == Water) begin
            Full_EXP_for_defend = 'd28;
        end else if (Def_Pok.pkm_type == Electric) begin
            Full_EXP_for_defend = 'd26;
        end else begin //if (Def_Pok.pkm_type == Normal) begin
            Full_EXP_for_defend = 'd29;
        end
    end else begin//if (Def_Pok.stage == Middle) begin
        if (Def_Pok.pkm_type == Grass) begin
            Full_EXP_for_defend = 'd63;
        end else if (Def_Pok.pkm_type == Fire) begin
            Full_EXP_for_defend = 'd59;
        end else if (Def_Pok.pkm_type == Water) begin
            Full_EXP_for_defend = 'd55;
        end else begin // if (MY_Pok.pkm_type == Electric) begin
            Full_EXP_for_defend = 'd51;
        end
    end
end
end
```

```
always_comb begin
    if (MY_Pok.stage == Lowest) begin
        if (MY_Pok.pkm_type == Grass) begin
            evolution_atk_for_my = 'd94;
        end else if (MY_Pok.pkm_type == Fire) begin
            evolution_atk_for_my = 'd96;
        end else if (MY_Pok.pkm_type == Water) begin
            evolution_atk_for_my = 'd89;
        end else begin // if (Def_Pok.pkm_type == Electric) begin
            evolution_atk_for_my = 'd97;
        end
    end else begin// if (Def_Pok.stage == Middle) begin
        if (MY_Pok.pkm_type == Grass) begin
            evolution_atk_for_my = 'd123;
        end else if (MY_Pok.pkm_type == Fire) begin
            evolution_atk_for_my = 'd127;
        end else if (MY_Pok.pkm_type == Water) begin
            evolution_atk_for_my = 'd113;
        end else begin // if (MY_Pok.pkm_type == Electric) begin
            evolution_atk_for_my = 'd124;
        end
    end
end
end
```

Thank you for your attention !!