Review: what we had on proposal

$Slots = (GS_{1M}, GS_{1R}, PS_{1M}, PS_{1R})$

$Games = \{g_1, g_2\}$

$Practices = \{p_1, p_3\}$ (p_3 not associated w/ g_2)

$notcompatible(g_1, g_2)$

$Unwanted\ (g_1, GS_{1M})$

$Partassign\ (p_1) = PS_{1R}$

$Practicemin(PS_{1R}) = 2$ (rest of slots have a min of 0)

$Practicemax(s) = 2$, $gamemax(s) = 3\ \forall$ slots

Soft constraint arguments:

$W_{minfilled} = 1$ $\quad Pen_{gamemin} = 1$

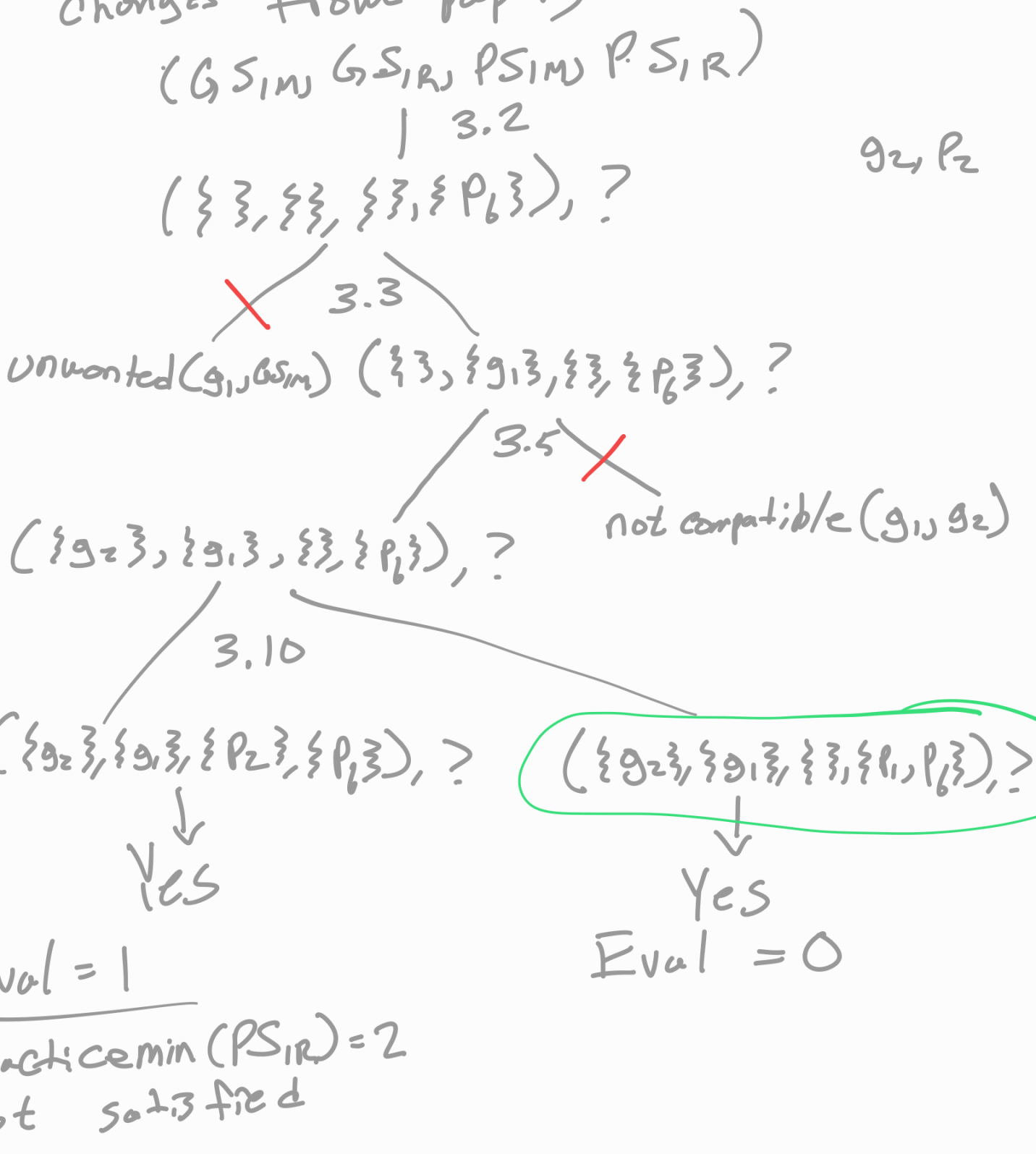
$W_{pref} = 0$ $\quad Pen_{practicemin} = 0$

$W_{pair} = 0$ $\quad Pen_{notpaired} = 0$

$W_{secdiff} = 0$ $\quad Pen_{section} = 0$

So $eval(assign) = Eval|_{minfilled}(assign)$

How model deals with above:
(No changes from paper)



Expanding the example:

Now we want to expand to test a few things.

-> slots on all days of the week work. Connected one.
MW, TR, F.

So we can add a corresponding slot to one of the current ones.

Add GS1W, PS1W.

Want to test city hard constraints which requires something for

- evening divisions (DIV 9_)
- Games with some tiers cannot be overlapping (ie two games with U13 cannot be in some slot)
- No games on T 11:00-12:30
- "special practice bookings"
  - ↳ CMSA U12T1S, CMSA U13T1S must be T, R 18:00-19:00
  - ↳ CMSA U12T1, CMSA U13T1 can not have any games overlap with "S" versions.

So we will add some games/practices oswell to deal with this.

Add g_3 = evening game

Add GS_{2R} = evening slot

Add g_4, same teir as g_1 = U13T3

Add GS_{1T} at 11:00 - 12:30
↳ No assignments allowed, different time from any R slots so they are not connected.

Add g_5 = U12T1

Add PS_{2R} from 18:00 - 19:00
↳ special practice slot
↳ overlaps with GS_{2R}

This gives:

connected meetings

Slots = { GS_{1M}, GS_{1T}, GS_{1W}, GS_{1R}, GS_{2R} (evening),
PS_{1M}, PS_{1W}, PS_{1R}, PS_{2R} (special) }

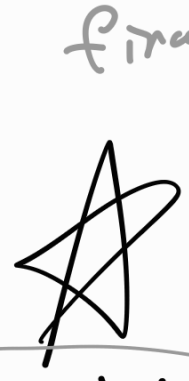
connected

↕ means overlapping.

Games = { g_1 (U13T3), g_2, g_3 (evening DIV 4), g_4 (U13T3), g_5 (U12T1) }

Practices = { P_1, P_6 } (P_6 not associate with any game).

We also want to test all the soft-constraint penalties but I will sort those out after stepping through tree, no change on final tree.



$(GS_{1M}, GS_{1T}, GS_{1W}, GS_{1R}, GS_{2R})$
PS_{1M}, PS_{1W}, PS_{1R}, PS_{2R}), ?

Note:
Red = hard constraint fail

$(\{\}, \{\}, \{\}, \{\}, \{\}, \{\}, \{\}, \{\}, \{\}, \{\})$, ?

3.2 (P_1)

PS_{1R} (1)

3.3 (91)

(1) assigned to slot

91 picked by Evens

unwanted ×

GS_{1M}, GS_{1W}

meeting ×

GS_{1T}

$GS_{1R}(1)$ $GS_{2R}(1)$

3.5 (92)

GS_{1M}, $GS_{1W}(1)$ GS_{1T} GS_{1R} $GS_{2R}(1)$

meeting ×

not compatible ×

3.9 (93)

not evening ×

GS_{1M}, GS_{1W}

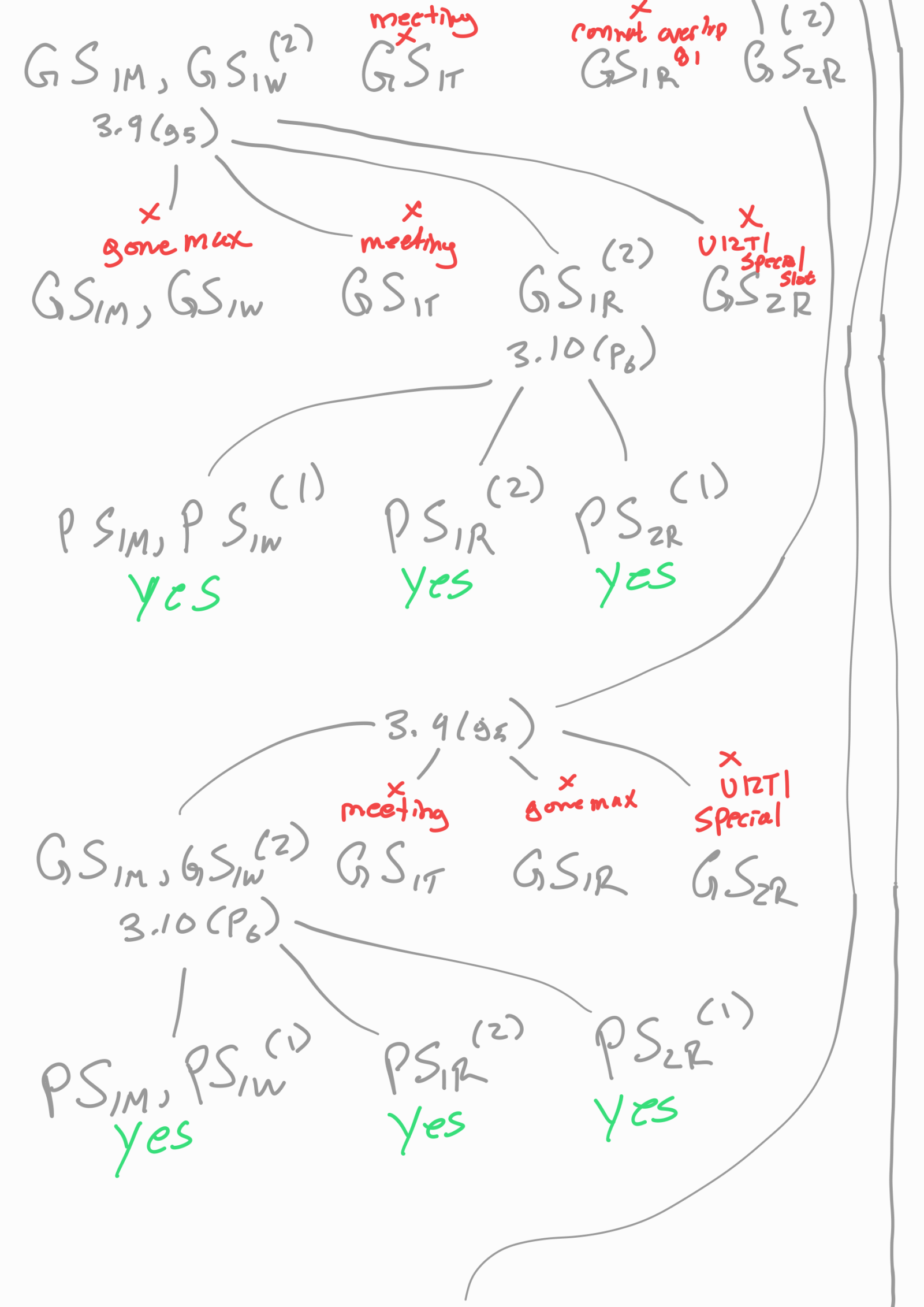
meeting ×

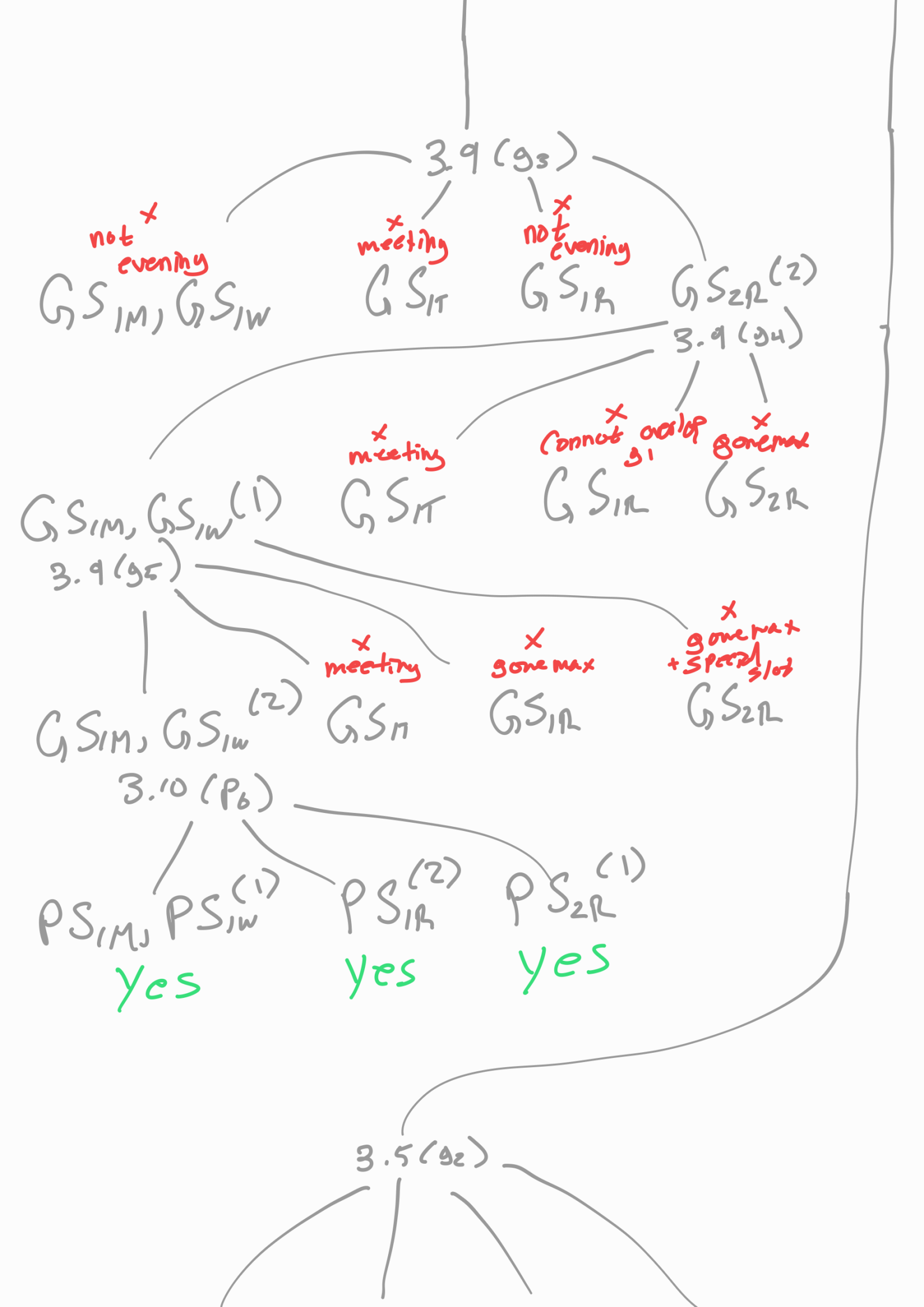
GS_{1T}

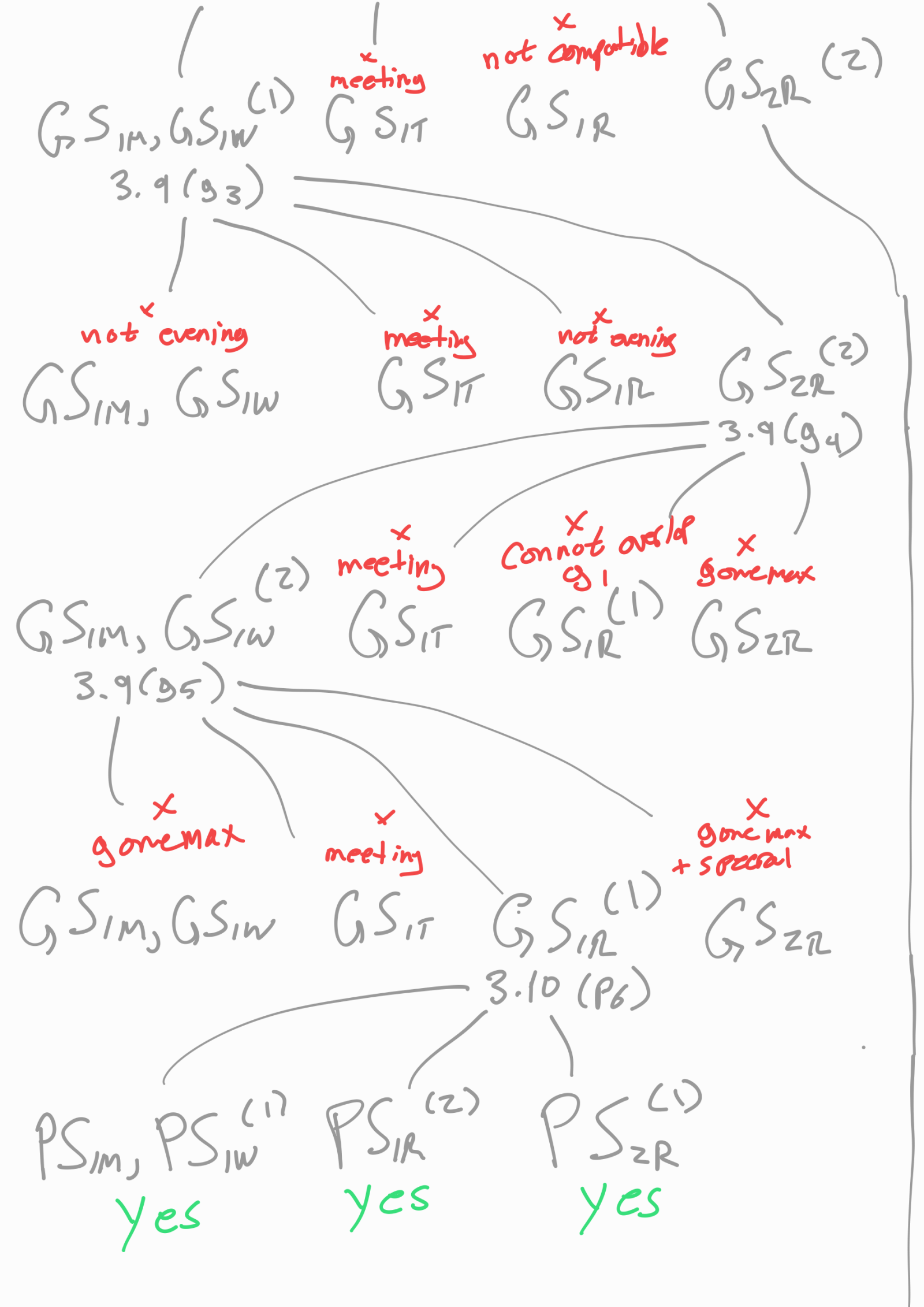
not evening ×

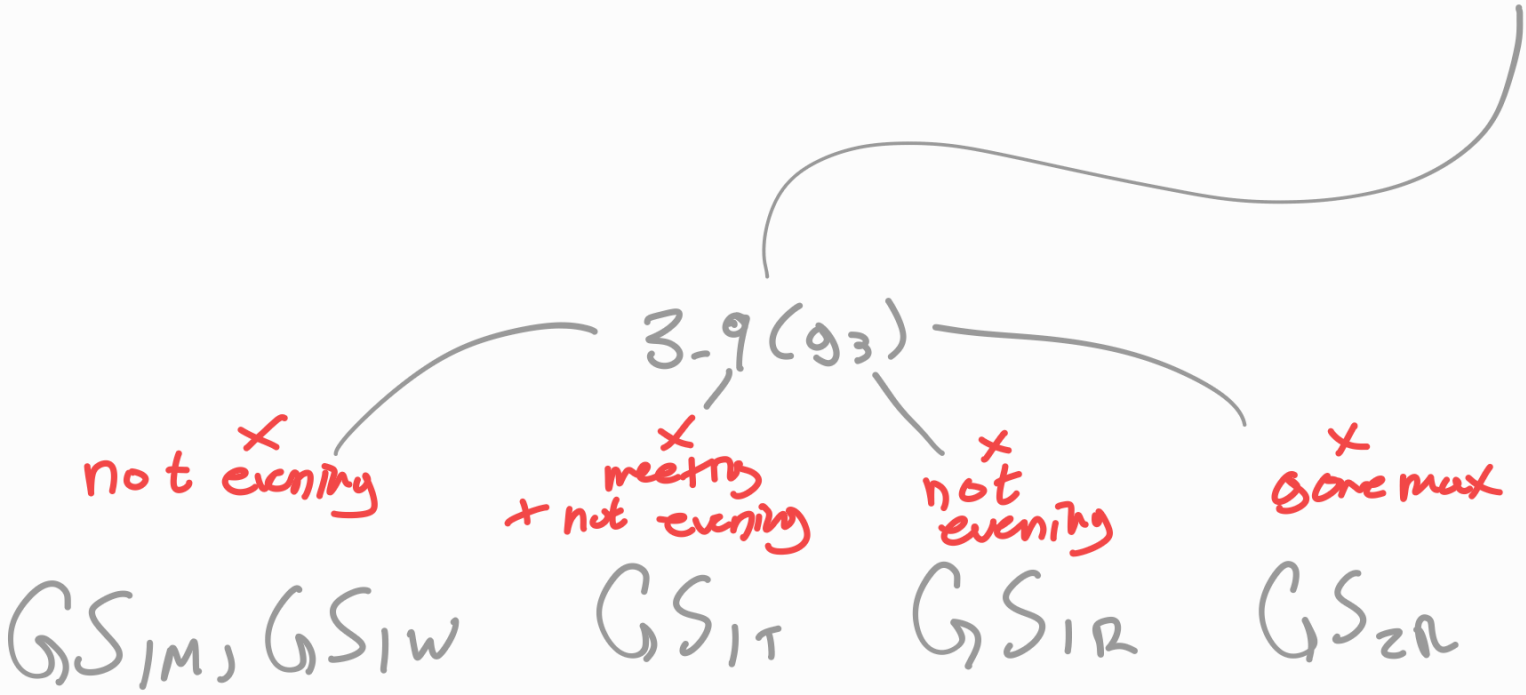
GS_{1R} $GS_{2R}(1)$

3.9 (94)


meeting
x
$GS_{IM}, GS_{IW}^{(2)}$
GS_{IT}
x
GS_{IR}
$GS_{2R}^{(2)}$
3.9(95)
x
gone max
x
meeting
x
U12T| special slot
GS_{IM}, GS_{IW}
GS_{IT}
$GS_{IR}^{(2)}$
GS_{2R}
3.10(P_6)
$PS_{IM}, PS_{IW}^{(1)}$
yes
$PS_{IR}^{(2)}$
yes
$PS_{2R}^{(1)}$
yes
3.9(95)
x
meeting
x
gone max
x
U12T| special
$GS_{IM}, GS_{IW}^{(2)}$
GS_{IT}
GS_{IR}
GS_{2R}
3.10(P_6)
$PS_{IM}, PS_{IW}^{(1)}$
yes
$PS_{IR}^{(2)}$
yes
$PS_{2R}^{(1)}$
yes


3.9 (g3)
not evening ×
meeting ×
not evening ×
GS1M, GS1W
GS1T
GS1R
GS2R (2)
3.9 (g4)
meeting ×
cannot overlap g1 ×
gone max ×
GS1M, GS1W (1)
GS1T
GS1R
GS2R
3.9 (g5)
meeting ×
gone max ×
gone max + special slot ×
GS1M, GS1W (2)
GS1T
GS1R
GS2R
3.10 (P6)
PS1M, PS1W (1)
PS1R (2)
PS2R (1)
yes
yes
yes
3.5 (g2)


GS1M, GS1W (1)
GS1T
GS1R
GS2R (2)
not compatible
meeting
3.9(g3)
not evening
meeting
not evening
GS1M, GS1W
GS1T
GS1R
GS2R (2)
3.9(g4)
GS1M, GS1W (2)
meeting
Connot overlap g1
gonemax
GS1T
GS1R (1)
GS2R
3.9(g5)
gonemax
meeting
gonemax + special
GS1M, GS1W
GS1T
GS1R (1)
GS2R
3.10 (P6)
PS1M, PS1W (1)
PS1R (2)
PS2R (1)
yes
yes
yes



All yes sols:

① ({92,94}, {}, {92,94}, {91,95}, {93}, {P6}, {P1}, {P6}, {})

② ({92,94}, {}, {92,94}, {91,95}, {93}, {}, {P1,P6}, {}, {})

③ ({92,94}, {}, {92,94}, {91,95}, {93}, {}, {P1}, {}, {P6})

④ ({92,95}, {}, {92,95}, {91}, {93,94}, {P6}, {P1}, {P6}, {})

⑤ ({g2, g5}, {}, {g2, g5}, {g1}, {g3, g4},
{ }, {P1, P6}, { }, { })

⑥ ({g2, g5}, {}, {g2, g5}, {g1}, {g3, g4},
{ }, {P1}, { }, {P6})

⑦ ({g4, g5}, {}, {g4, g5}, {g1}, {g2, g3},
{P6}, {P1}, {P6}, { })

⑧ ({g4, g5}, {}, {g4, g5}, {g1}, {g2, g3},
{ }, {P1, P6}, { }, { })

⑨ ({g4, g5}, {}, {g4, g5}, {g1}, {g2, g3},
{ }, {P1}, { }, {P6})

⑩ ({g2, g4}, {}, {g2, g4}, {g<}, {g1, g3},
{P6}, {P1}, {P6}, { })

⑪ ({g2, g4}, {}, {g2, g4}, {g<}, {g1, g3},
{ }, {P1, P6}, { }, { })

⑫ ({g2, g4}, {}, {g2, g4}, {g<}, {g1, g3},
{ }, {P1}, { }, {P6})

We would then run **eval** on all the yes sol to check for the one with the best soft constraints.

↳ Can adjust penalties and weights to give different results.

With the same parameters as the initial example, that is:

$W_{minfilled} = 1$ $\quad Pen_{gamemin} = 1$

$W_{pref} = 0$ $\quad Pen_{practicemin} = 0$

$W_{pair} = 0$ $\quad Pen_{notpaired} = 0$

$W_{secdiff} = 0$ $\quad Pen_{section} = 0$

and all $gamemin(GS_i) = 0$ and $practicemin(PS_j) = 0$ except $practicemin(PS_{1R}) = 2$ we get:

We would get sols

↳ 2, 5, 8, 11 eval to 0

↳ rest eval to 1 because PS_{1R} has less than 2 practices.

So 2 would be picked

I intend to extend the file to include both

-> Preference

-> Pair

This is really just soft constraint stuff so I will add new files with solutions for differing parameters.