

# Grammar for Language Describing Game Structures

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## Pretty-printed EBNF grammar:

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 $\langle game \rangle ::= \text{'Players:'} \langle teamList \rangle \text{'Rounds:'} \langle roundList \rangle \text{'Win:'} \langle winCondition \rangle$   
 $\langle teamList \rangle ::= (\langle team \rangle \text{';' } \langle team \rangle) \mid \langle playerList \rangle \mid \text{'randomly divide'} \langle playerList \rangle$   
 $\quad \text{'into'} \langle nameList \rangle \mid \text{'all with'} \langle attributeList \rangle$   
 $\langle team \rangle ::= \text{'team'} \langle name \rangle \text{'.'} \langle playerList \rangle$   
 $\langle playerList \rangle ::= \langle player \rangle \text{',' } \langle player \rangle$   
 $\langle player \rangle ::= \langle name \rangle \mid \text{'with'} \langle attributeList \rangle$   
 $\langle attributeList \rangle ::= \langle attribute \rangle \text{',' } \langle attribute \rangle$   
 $\langle attribute \rangle ::= \text{'affiliation called'} \langle name \rangle \mid (\text{'score'} \mid \text{'resource'} \mid \text{'counter'})$   
 $\quad \text{'called'} \langle name \rangle \mid \text{'starting at'} \langle number \rangle \mid \text{'with minimum of'} \langle number \rangle$   
 $\quad \text{'with maximum of'} \langle number \rangle$   
 $\langle roundList \rangle ::= \langle round \rangle \text{';' } \{ \langle round \rangle \}$   
 $\langle round \rangle ::= \langle phaseList \rangle \mid \text{'repeated'} \langle number \rangle \text{'times'} \mid \text{'with modifications'}$   
 $\quad \text{'.'} \langle modifierList \rangle$   
 $\langle modifierList \rangle ::= \langle modifier \rangle \text{'.'} \{ \langle modifier \rangle \}$   
 $\langle modifier \rangle ::= [\text{'just'} \mid \text{'from'}] (\langle roundReference \rangle (\text{'before'} \mid \text{'after'} \mid \text{'instead of'})$   
 $\quad \langle phaseReference \rangle \text{'insert'} \langle phase \rangle)$   
 $\langle roundReference \rangle ::= \text{'round'} \langle number \rangle$   
 $\langle phaseReference \rangle ::= \text{'phase'} \langle number \rangle$   
 $\langle phase \rangle ::= \langle action \rangle \mid \langle progression \rangle$ 
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$\langle phaseList \rangle ::= \langle phase \rangle \text{ ‘.’ } \{ \langle phase \rangle \}$   
 $\langle action \rangle ::= \langle competition \rangle \mid \langle decision \rangle$   
 $\langle competition \rangle ::= [\text{‘scored’}] [\text{‘team’}] \text{ ‘competition between’ } \langle identifierList \rangle$   
 $\langle decision \rangle ::= \text{‘vote by’ } \langle identifierList \rangle \text{ ‘between’ } \langle identifierList \rangle [\text{‘including self’}]$   
 $\quad \mid \text{‘nomination of’ } \langle number \rangle \text{ ‘by’ } \langle identifierList \rangle \text{ ‘between’ } \langle identifierList \rangle$   
 $\quad [\text{‘including self’}] \mid \text{‘allocation of’ } \langle name \rangle \text{ ‘by’ } \langle identifierList \rangle \mid \text{‘directed vote by’}$   
 $\quad \langle identifierList \rangle \text{ ‘between’ } \langle identifierList \rangle [\text{‘including self’}] \mid \text{‘uses?’ } \langle identifier \rangle$   
 $\quad \text{‘then’ ‘(’ } \langle phaseList \rangle \text{ ‘)’ } [\text{‘otherwise’ ‘(’ } \langle phaseList \rangle \text{ ‘)’}]$   
 $\langle progression \rangle ::= (\langle affiliationUpdate \rangle \mid \langle counterUpdate \rangle) (\text{‘for’} \mid \text{‘of’}) \langle identifierList \rangle$   
 $\langle affiliationUpdate \rangle ::= \text{‘elimination’} \mid (\text{‘add’} \mid \text{‘remove’}) \langle name \rangle \mid [\text{‘number preserving’}]$   
 $\quad \text{‘swap’ } \langle nameList \rangle [\text{‘adding’ } \langle nameList \rangle] \mid \text{‘change’ } \langle name \rangle \text{ ‘to’ } \langle name \rangle \mid$   
 $\quad \text{‘merge’ } \langle nameList \rangle [\text{‘to’ } \langle name \rangle]$   
 $\langle counterUpdate \rangle ::= (\text{‘increase’} \mid \text{‘decrease’}) \langle name \rangle \text{ ‘by’ } \langle value \rangle \mid \text{‘set’ } \langle name \rangle$   
 $\quad \text{‘to’ } \langle value \rangle$   
 $\langle value \rangle ::= \langle number \rangle \mid \langle name \rangle \mid \text{‘results’ ‘of’ } (\langle compReference \rangle \mid \langle allocateReference \rangle$   
 $\quad \mid \langle voteReference \rangle)$   
 $\langle identifierList \rangle ::= \langle idValList \rangle [\text{‘except’ } \langle idList \rangle]$   
 $\langle idList \rangle ::= \langle identifier \rangle \{ \text{‘,’ } \langle identifier \rangle \}$   
 $\langle idValList \rangle ::= \langle identifierVal \rangle \{ \text{‘,’ } \langle identifierVal \rangle \}$   
 $\langle identifierVal \rangle ::= \langle identifier \rangle [\text{‘*’ } \langle value \rangle]$   
 $\langle identifier \rangle ::= \text{‘everyone’} \mid \langle name \rangle \mid \text{‘chance’ } \langle number \rangle \text{ ‘(’ } \langle identifierList \rangle \text{ ‘)’} \mid$   
 $\quad \text{‘nominated’} \mid \text{‘tied’} \mid \text{‘eliminated’} \mid (\text{‘winner’} \mid \text{‘loser’}) \text{ ‘of’ } \langle compReference \rangle$   
 $\quad \mid (\text{‘majority’} \mid \text{‘minority’}) \text{ ‘of’ } \langle voteReference \rangle [\langle tiebreaker \rangle] \mid (\text{‘highest’}$   
 $\quad \mid \text{‘lowest’} \mid \text{‘most’} \mid \text{‘least’}) \langle name \rangle \text{ ‘(’ } \langle identifierList \rangle \text{ ‘)’} [\langle tiebreaker \rangle]$   
 $\langle compReference \rangle ::= \text{‘competition’} [\langle number \rangle]$   
 $\langle allocateReference \rangle ::= \text{‘allocation’} [\langle number \rangle]$   
 $\langle voteReference \rangle ::= \text{‘vote’} [\langle number \rangle]$   
 $\langle tiebreaker \rangle ::= \text{‘tied broken by’ } \langle name \rangle \text{ ‘:’ } [\langle action \rangle] \langle identifier \rangle$   
 $\langle name \rangle ::= (\text{‘a’} \mid \dots \mid \text{‘z’} \mid \text{‘A’} \mid \dots \mid \text{‘Z’}) \{ \text{‘a’} \mid \dots \mid \text{‘z’} \mid \text{‘A’} \mid \dots \mid \text{‘Z’} \mid \text{‘0’} \mid \dots \mid \text{‘9’} \}$

$\langle nameList \rangle ::= \langle name \rangle \{', ' \langle name \rangle\}$

$\langle number \rangle ::= [-] ('0' | \dots | '9')^+$

$\langle winCondition \rangle ::= \text{'reach'} \langle goalList \rangle [\text{'for team'}] | [\text{'team'}] \text{'competition'} |$   
 $\langle identifierList \rangle [\text{'for team'}] | \langle number \rangle \text{'member jury vote'} | \text{'survive'}$

$\langle goal \rangle ::= \langle number \rangle \langle name \rangle$

$\langle goalList \rangle ::= \langle goal \rangle \{', ' \langle goal \rangle\}$

Notes:

- make grammar unambiguous
- should allocate be a decision and progression or just progression? Both, but decision will automatically also do the progression. The progression exists for non-decision related resource updates, such as awarding a player more of a resource for winning a competition.