

Grammar for Language Describing Game Structures

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Pretty-printed EBNF grammar:

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 $\langle game \rangle ::= \langle roundList \rangle \text{ 'played by' } \langle teamList \rangle \text{ 'wonBy' } \langle winConditionList \rangle$   
 $\langle teamList \rangle ::= (\langle team \rangle \{ \text{' , ' } \langle team \rangle \} \mid \langle playerList \rangle \mid \text{ 'randomly divide' } \langle playerList \rangle \text{ 'into' } \langle nameList \rangle) [\text{ 'all' } \langle attributeList \rangle]$   
 $\langle team \rangle ::= \text{ 'team' } \langle name \rangle \langle playerList \rangle$   
 $\langle playerList \rangle ::= \langle player \rangle \{ \text{' ; ' } \langle player \rangle \}$   
 $\langle player \rangle ::= \langle name \rangle \langle attributeList \rangle$   
 $\langle attributeList \rangle ::= \langle attribute \rangle \{ \text{' , ' } \langle attribute \rangle \}$   
 $\langle attribute \rangle ::= \langle affiliation \rangle \mid \langle score \rangle [\langle number \rangle] \mid \langle resource \rangle [\langle number \rangle]$   
 $\langle affiliation \rangle ::= \text{ 'affiliated with' } \langle name \rangle$   
 $\langle score \rangle ::= \text{ 'score' } \langle name \rangle$   
 $\langle resource \rangle ::= \text{ 'resource' } \langle name \rangle$   
 $\langle roundList \rangle ::= \langle round \rangle \{ \text{' ; ' } \langle round \rangle \} [\langle modifierList \rangle]$   
 $\langle modifierList \rangle ::= \langle modifier \rangle \{ \text{' , ' } \langle modifier \rangle \}$   
 $\langle modifier \rangle ::= \langle roundReference \rangle (\text{ 'before' } \mid \text{ 'after' }) \langle phaseReference \rangle \text{ 'insert' } \langle phase \rangle$   
 $\langle roundReference \rangle ::= \text{ 'round' } \langle number \rangle$   
 $\langle phaseReference \rangle ::= \text{ 'phase' } \langle number \rangle$   
 $\langle round \rangle ::= \langle phase \rangle \{ \text{' , ' } \langle phase \rangle \} [\text{ 'repeated' } \langle number \rangle \text{ 'times' }]$ 
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$\langle phase \rangle ::= \langle action \rangle \mid \langle progression \rangle$
 $\langle action \rangle ::= \langle competition \rangle \mid \langle decision \rangle$
 $\langle competition \rangle ::= [\text{'scored'} \mid \text{'placed'}] [\text{'team'}] \text{'competition between'} \langle idList \rangle$
 $\langle decision \rangle ::= [\text{'self-included'}] \text{'vote by'} \langle idList \rangle \text{'between'} \langle idList \rangle [\text{'tiebroken by'} (\langle decision \rangle \mid \langle competition \rangle)] \mid [\text{'self-included'}] \text{'nomination of'} \langle number \rangle \text{'of'} \langle idList \rangle \text{'by'} \langle identifier \rangle \mid \text{'allocate'} \langle resource \rangle \mid \text{'binary'}$
 $\langle progression \rangle ::= (\langle affiliationUpdate \rangle \mid \langle scoreUpdate \rangle \mid \langle resourceUpdate \rangle) \text{'for'} \langle idList \rangle$
 $\langle affiliationUpdate \rangle ::= \text{'elimination'} \mid (\text{'add'} \mid \text{'remove'}) \langle affiliation \rangle \mid [\text{'evenly'} \mid \text{'number preserving'}] \text{'swap'} \langle affiliationList \rangle [\text{'adding'} \langle affiliationList \rangle] \mid \text{'change'} \langle affiliation \rangle \text{'to'} \langle affiliation \rangle$
 $\langle scoreUpdate \rangle ::= (\text{'increase'} \mid \text{'decrease'}) \langle score \rangle \text{'by'} \langle earning \rangle \mid \text{'set'} \langle score \rangle \text{'to'} \langle earning \rangle$
 $\langle resourceUpdate \rangle ::= (\text{'gain'} \mid \text{'expend'}) \langle earning \rangle \langle resource \rangle \mid \text{'set'} \langle resource \rangle \text{'to'} \langle earning \rangle$
 $\langle earning \rangle ::= \langle number \rangle \mid \langle resultReference \rangle \mid \langle allocateReference \rangle$
 $\langle resultReference \rangle ::= \text{'scored competition'} \langle number \rangle$
 $\langle allocateReference \rangle ::= \text{'allocation'} \langle number \rangle \text{'amount'}$
 $\langle idList \rangle ::= \langle identifier \rangle \{ \text{' , ' } \langle identifier \rangle \} [\text{'except'} \langle idList \rangle]$
 $\langle identifier \rangle ::= (\text{'everyone'} \mid \langle name \rangle \mid \langle affiliation \rangle \mid \langle idReference \rangle \mid \text{'chance'}) [\text{'*'} \langle earning \rangle]$
 $\langle idReference \rangle ::= \langle compReference \rangle (\text{'winner'} \mid \text{'loser'}) \mid \langle voteReference \rangle (\text{'majority'} \mid \text{'minority'}) \text{'voted'}$
 $\langle compReference \rangle ::= \text{'placed competition'} \langle number \rangle$
 $\langle voteReference \rangle ::= \text{'vote'} \langle number \rangle$
 $\langle allocationReference \rangle ::= \text{'allocation'} \langle number \rangle$
 $\langle name \rangle ::= (\text{'a'} \mid \dots \mid \text{'z'} \mid \text{'A'} \mid \dots \mid \text{'Z'}) \{ \text{'a'} \mid \dots \mid \text{'z'} \mid \text{'A'} \mid \dots \mid \text{'Z'} \mid \text{'0'} \mid \dots \mid \text{'9'} \}$
 $\langle number \rangle ::= (\text{'0'} \mid \dots \mid \text{'9'})^+$

$$\begin{aligned} \langle winCondition \rangle &::= (\langle score \rangle \mid \langle resource \rangle) \text{'hits'} \langle number \rangle \mid \text{'final competition'} \\ &\quad \mid (\text{'highest'} \mid \text{'lowest'}) (\langle score \rangle \mid \langle resource \rangle) \mid \langle number \rangle \text{'member jury vote'} \\ \langle winConditionList \rangle &::= \langle winCondition \rangle \{', ' \langle winCondition \rangle\} \end{aligned}$$

Notes:

- make grammar unambiguous
- Potentially include "directed vote" type of decision where a player chooses another player as well as a direction (i.e. move that player ahead or backwards)
- I've restricted player attributes into 3 categories, with no opportunity for customization outside those three. Am I okay with this?
- affiliation used everywhere, get syntax right
- 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.
- combine score and resource?