

League of Legends's Champion

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1. Application Description

The purpose of our application is to recommend the champions to players who play League of legends but don't have enough knowledge to make a decision of what to pick in that match they are playing in. The champions considered in the work are all champion releases in patch 11.9.

We use the class and playstyle of each champion as a reference to recommend what to play, most champion have many playstyle to play and most veteran player have to be versatile and adapt at many playstyle but if you want to go high ranking you should focus on what playstyle you like and stick with it, we provide rule that can consider enemy champion to find what class have advantage against them. If you know what your allies are playing we can suggest the champion with a playstyle that has synergy with each other.

2. Question Description

2.1. **Question 1:** I want to know which champion has this class and this playstyle?

- FOL Rule:

```
champion_class_style(X, Y, Z) :-  
    champion(X), class(Y), playstyle(Z),  
    has_class(X,Y),  
    has_playstyle(X,A),  
    member(Z,A).
```

- Rule explanation:

Using the playstyle(Z) and class(Y) to find champion X that has playstyle Z and class Y.

- X is a champion that has class(Y) and playstyle(X).
- Y is the class of champion(X).
- Z is the playstyle of champion(X).
- Use has_class(X,Y) to consider that champion(X) has class(Y).
- Use has_playstyle(X,A) and member(Z,A) to consider that champion(X) has playstyle(Z) in list(A) which is a list of playstyles that champion(X) has.

2.2. **Question 2:** If I like playing with a specific spell cost in a specific role, which champion should I pick?

- FOL Rule:

```
champion_cost_role(X, Y, Z) :-  
    champion(X), skill_cost(Y), role(Z),  
    use_skill_cost(X,Y),  
    has_role(X,A),  
    member(Z,A).
```

- Rule explanation:

Using the role(Z) and skill_cost(Y) to find champion X that has role Z and skill_cost Y.

- X is a champion that has skill_cost(Y) and role(X).
- Y is the skill_cost of champion(X).
- Z is the role of champion(X).
- Use use_skill_cost(X,Y) to consider that champion(X) use skill_cost(Y).
- Use has_role(X,A) and member(Z,A) to consider that champion(X) has role(Z) in list(A) which is a list of roles that champion(X) has.

2.3. **Question 3:** If I like a specific class and I have to play a specific role, which champion should I pick?

- FOL Rule:

champion_class_role(X, Y, Z) :-
 champion(X), class(Y), role(Z),
 has_class(X,Y),
 has_role(X,A),
 member(Z,A).

- Rule explanation:

Using the role(Z) and class(Y) to find champion X that has role Z and class Y.

- X is a champion that has class(Y) and role(X).
- Y is the class of champion(X).
- Z is the role of champion(X).
- Use has_class(X,Y) to consider that champion(X) has class(Y).
- Use has_role(X,A) and member(Z,A) to consider that champion(X) has role(Z) in list(A) which is a list of roles that champion(X) has.

2.4. **Question 4:** If I like a specific playstyle and I have to play a specific role, which champion should I pick?

- FOL Rule:

champion_style_role(X, Y, Z) :-
 champion(X), playstyle(Y), role(Z),
 has_playstyle(X,A),
 member(Y,A),
 has_role(X,B),
 member(Z,B).

- Rule explanation:

Using playstyle(Y) and role(Z) to find champion X with playstyle Y and role Z.

- X is a champion that has playstyle(Y) and role(X).
- Y is the playstyle of champion(X).
- Z is the role of champion(X).
- Use has_playstyle(X,A) and member(Y,A) to consider that champion(X) has playstyle(Y) in list(A) which is a list of playstyles that champion(X) has.
- Use has_role(X,B) and member(Z,B) to consider that champion(X) has role(Z) in list(B) which is a list of roles that champion(X) has.

2.5. **Question 5:** I want to know which champion has this class and this playstyle with this skill cost in this role?

- FOL Rule:

champion_specific(X,A,B,C,D) :-

champion(X), class(A), playstyle(B), skill_cost(C), role(D),

champion_class_style(X,A,B),

champion_cost_role(X,C,D).

- Rule explanation:

Using class(A), playstyle(B), skill_cost(C), role(D) to find champion X.

- X is a champion that has class(A), playstyle(B), skill_cost(C) and role(D).
- A is the class of champion(X).
- B is the playstyle of champion(X).
- C is the skill_cost of champion(X).
- D is the role of champion(X).
- Use champion_class_style(X,A,B) to find champion(X) that has class(A) and playstyle(B). (Rule 2.1)
- Use champion_cost_role(X,C,D) to find champion(X) that has skill_cost(C) and role(D). (Rule 2.2)

2.6. **Question 6:** If I want to help out my team, what champion should I pick?

- FOL Rule:

compatible_champ(X,Y) :-
 champion(X), champion(Y),
 has_playstyle(X,A),
 member(V,A),
 has_playstyle(Y,B),
 member(W,B),
 compatible(V, C),
 member(W, C),
 X\=Y.

- Rule explanation:

Get all playstyle of champion Y then compare all playstyle that is compatible and use it to find champion X with that playstyle.

- X is a champion who wants to play along with champion(Y).
- Y is a champion who wants to play along with champion(X).
- Use has_playstyle(X,A) and member(V,A) to consider that champion(X) has playstyle(V) in list(A) which is a list of playstyle that champion(X) has.
- Use has_playstyle(Y,B) and member(W,B) to consider that champion(Y) has playstyle(W) in list(B) which is a list of playstyle that champion(Y) has.
- Use compatible(A,C) and member(B,C) to consider that playstyle(A) has playstyle(B) in list(C) which is a list of playstyle that playstyle(A) has synergy with.
- Use X\=Y to consider that champion(X) is not the same champion as champion(Y).

2.7. **Question 7:** I'm a beginner and I like to play with a specific class, which champions should I pick?

- FOL Rule:

beginner_select_class(X,Y) :-
 champion(X), class(Y),
 has_class(X,Y),
 has_difficulty(X,1).

- Rule explanation:

Using class(Y) to find the champion(X) with that class that has low difficulty using has_difficulty(X,1).

- X is a champion that has class(Y).
- Y is a class that you like to play.
- Use has_class(X, Y) to consider that champion(X) has class(Y).
- Use has_difficulty(X, 1) to consider that champion(X) is for beginners.

- 2.8. **Question 8:** I'm a beginner and I like to play with a specific style, which champions should I pick?
- FOL Rule:
beginner_select_style(X,Y) :-
 champion(X), playstyle(Y),
 has_playstyle(X,A),
 member(Y,A),
 has_difficulty(X,1).
 - Rule explanation:
Using playstyle(Y) to find the champion(X) with that playstyle that has low difficulty using has_difficulty(X,1).
 - X is a champion that has playstyle(X),
 - Y is a playstyle that you like to play.
 - Use has_playstyle(X,A) and member(Y,A) to consider that champion(X) has playstyle(Y) in list(A) which is a list of playstyles that champion(X) has.
 - Use has_difficulty(X, 1) to consider that champion(X) is for beginners.
- 2.9. **Question 9:** I play in solo laner and I'm fighting against a specific champion which champion should I pick?
- FOL Rule:
solo_counter_pick(X,Y,R) :-
 champion(X), champion(Y), role(R),
 has_class(X,A),
 has_class(Y,B),
 has_advantage(A, C),
 member(B, C),
 has_role(X,D),
 member(R,D).
 - Rule explanation:
Determine role(R) that you are playing and enemy champion(Y). find enemy class and find the champion with class that has advantage with role(R).
 - X is your champion.
 - Y is a champion you're fighting against with.
 - R is your role.
 - Use has_class(X,A) to consider that champion(X) has class(A).
 - Use has_class(Y,B) to consider that champion(Y) has class(B).
 - Use has_advantage(A,C) and member(B,C) to consider that class(A) has class(B) in list(C) which is a list of classes that class(A) has an advantage against.
 - Use has_role(X,D) and member(R,D) to consider that champion(X) has role(R) in list(D) which is a list of roles that champion(X) has.

2.10. **Question 10:** I play in duo laner and I am fighting against specific champions, which champion should I pick?

- FOL Rule:

```
duo_counter_pick(X,Y) :-  
    champion(X),  
    member(A, Y),  
    champion(A),  
    ( solo_counter_pick(X,A,bottom) ; solo_counter_pick(X,A,support) ).
```

- Rule explanation:

Enemies Y is a list then separate them to consider each case for each enemy by using solo_counter_pick ([Rule 2.9](#)) to find what champion X is good for this enemy (champion X with specific role of bottom or support).

- X is your champion.
- Y is a list of champions in enemy duo lane.
- Use member(A, Y) to choose champion(A) from list(Y).
- Use (solo_counter_pick(X,A,bottom) ; solo_counter_pick(X,A,support)) to consider that champion(X) has advantage against champion(A) and champion(X) is the champion from duo lane which has two possible roles that is bottom and support. ([Rule 2.9](#))

2.11. **Question 11:** I have to play with a specific role and I want to rank up, which champions should I pick?

- FOL Rule:

```
meta_by_role(X,Y) :-  
    champion(X), role(Y),  
    has_role(X, A),  
    member(Y, A),  
    meta(Y, B),  
    member(X, B).
```

- Rule explanation:

Using role(Y) to find the champion(X) that has a high win rate in that role using meta.

- X is a champion that has a high win rate when playing in role(Y).
- Y is your role.
- Use has_role(X,A) and member(Y,A) to consider that champion(X) has role(Y) in list(A) which is a list of roles that champion(X) has.
- Use meta(Y,B) and member(X,B) to consider that role(Y) has champion(X) in list(B) which is a list of champions that have a high win rate when playing in role(Y).

2.12. **Question 12:** There are ... allies and there are ... enemies, which champion should I pick.

- FOL Rule:

select_based_on_pick(X,R,Y,Z) :-
 champion(X), role(R),
 member(A, Y),
 champion(A),
 compatible_champ(X,A),
 member(B, Z), champion(B),
 solo_counter_pick(X,B,R).

- Rule explanation:

Determine role(R) that you are playing, the list of allied champions (Y) and the list of enemy champions (Z) to find a champion that is compatible with allied champion using compatible_champ (Rule 6) and has advantage against enemy champions using solo_counter_pick (Rule 9).

- X is your champion.
- R is your role.
- Y is a list of allied champions.
- Z is a list of enemy champions.
- Use member(A, Y) to choose champion(A) from list(Y).
- Use compatible_champ(X,A) to consider that champion(X) has synergy with champion(A) who is an ally champion. (Rule 2.6)
- Use member(B, Z) to choose champion(B) from list(Z).
- Use solo_counter_pick(X,B) to consider that champion(X) has advantage against champion(B) who is an enemy champion. (Rule 2.9)

● For return easier-looking result

set_of_recommend_champion(X,R,Y,Z) :-

 setof(X, select_based_on_pick(X,R,Y,Z), X).

Explanation: Same rule as (Rule 2.12) but results have no duplicate.

list_of_recommend_champion(X,R,Y,Z) :-

 bagof(X, select_based_on_pick(X,R,Y,Z), X).

element_count(X,N,L) :-

 aggregate(count,member(X,L),N).

max_element_count2(X,N,L) :-

 aggregate(max(N1),X1, element_count(X1,N1,L),N), member(X,L),

 element_count(X,N,L), !.

recommend_champion(A,X,R,Y,Z) :-

 list_of_recommend_champion(X,R,Y,Z),

 max_element_count2(A,_,X).

Explanation: A is recommend champion based on most advantage and synergy

X R Y Z use same rule as (Rule 2.12)

3. Predicates and Facts

- 3.1. **champion(x)** means x is the champion's name.
champion(ahri).
champion(akali).
- 3.2. **role(x)** means x is the role's name
role(bottom).
role(jungle).
- 3.3. **class(class_name)** means x is the class's name.
class(controller).
class(fighter).
- 3.4. **playstyle(playstyle)** means x is playstyle's name.
playstyle(tank).
playstyle(duelist).
- 3.5. **skill_cost(x)** means x is what that skill cost called.
skill_cost(mana).
skill_cost(energy).
- 3.6. **has_role(x,y)** means that champion x can have roles y.
has_role(lulu, [support]).
has_role(jax, [top, jungle]).
- 3.7. **has_playstyle(x,y)** means that champion x has playstyle y
has_playstyle(corki, [hyper_carry, control, roamer]).
has_playstyle(darius, [duelist, snowballer, lane_bully]).
- 3.8. **has_class(x,y)** means that champion x has class y.
has_class(ahri, mage).
has_class(aatrox, fighter).
- 3.9. **has_difficulty(x,y)** means that y is difficulty(1/2/3) of champion x.
has_difficulty(ahri, 2).
has_difficulty(akali, 2).
- 3.10. **use_skill_cost(x,y)** means that y is the primary skill cost of champion x.
use_skill_cost(ahri, mana).
use_skill_cost(akali, energy).

- 3.11. **has_advantage(x,y)** means that class x has advantage against classes y.
has_advantage(fighter, [slayer, tank]).
has_advantage(slayer, [mage, marksman]).
- 3.12. **compatible(x,y)** means that playstyle x has synergy with playstyles y.
compatible(initiator, [tank, snowballer, assassin, control, roamer, hyper_carry, lane_bully, engage]).
compatible(snowballer, [tank, duelist, initiator, assassin, control, roamer, engage, enchanter]).
- 3.13. **meta(x,y)** means that has high win rate in role x has champions y.
meta(top, [kled, urgot, darius, shen, malphite, nasus, garen, dr_mundo, wukong, cho_gath]).
meta(jungle, [shaco, elise, nocturne, udyr, nunu, volibear, diana, morgana]).

Class Advantage and Disadvantage						
Class	Controller	Fighter	Mage	Marksman	Slayer	Tank
Controller	-	-	-	-	-	-
Fighter	-	-	X	X	O	O
Mage	-	O	-	O	X	X
Marksman	-	O	X	-	X	O
Slayer	-	X	O	O	-	X
Tank	-	X	O	X	O	-

**Note : Controller is a support class which focuses on helping allies.

PlayStyle compatibility with allies											
Playstyle	Tank	Duelist	Initiator	Snowballer	Assassin	Control	Roamer	Hyper Carry	Lane Bully	Engage	Enchanter
Tank	-	X	O	O	X	O	O	O	X	O	O
Duelist	X	-	X	O	O	X	O	O	O	X	O
Initiator	O	X	-	O	O	O	O	O	O	O	X
Snowballer	O	O	O	-	O	O	O	X	X	O	O
Assassin	X	O	O	O	-	X	O	X	O	O	X
Control	O	X	O	O	X	-	X	O	O	X	O
Roamer	O	O	O	O	O	X	-	O	X	O	X
Hyper Carry	O	O	O	X	X	O	O	-	O	X	O
Lane Bully	X	O	O	X	O	O	X	O	-	O	O
Engage	O	X	O	O	O	X	O	X	O	-	O
Enchanter	O	O	X	O	X	O	X	O	O	O	-

Sources:

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