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Dataset representation and  
possible analysis



*Ranked Matches*



LEAGUE OF  
LEGENDS



# Dataset: League of Legends Ranked Matches

180k Ranked Solo  
Games

Starting from 2014

Matches (184.069)  
Player statistics (1.117.940)  
Team statistics (368.138)  
Participants (1.834.520)  
Bans (1.099.185)

Riot API

# Columns: League of Legends Ranked Matches

## TEAMSTATS

MATCHID	TEAMID	FIRSTBLOOD
HARRYKILLS	FIRSTINHIBITOR	FIRSTBARON
FIRSTTURRET	FIRSTHARRY	TOWERKILLS
FIRSTDRAKON	BARONKILLS	DRAGONKILLS
INHIBITORKILLS		

## TEAMBANS

MATCHID	TEAMID	CHAMPIONID	BANTURN

## CHAMPS

ID	NAME

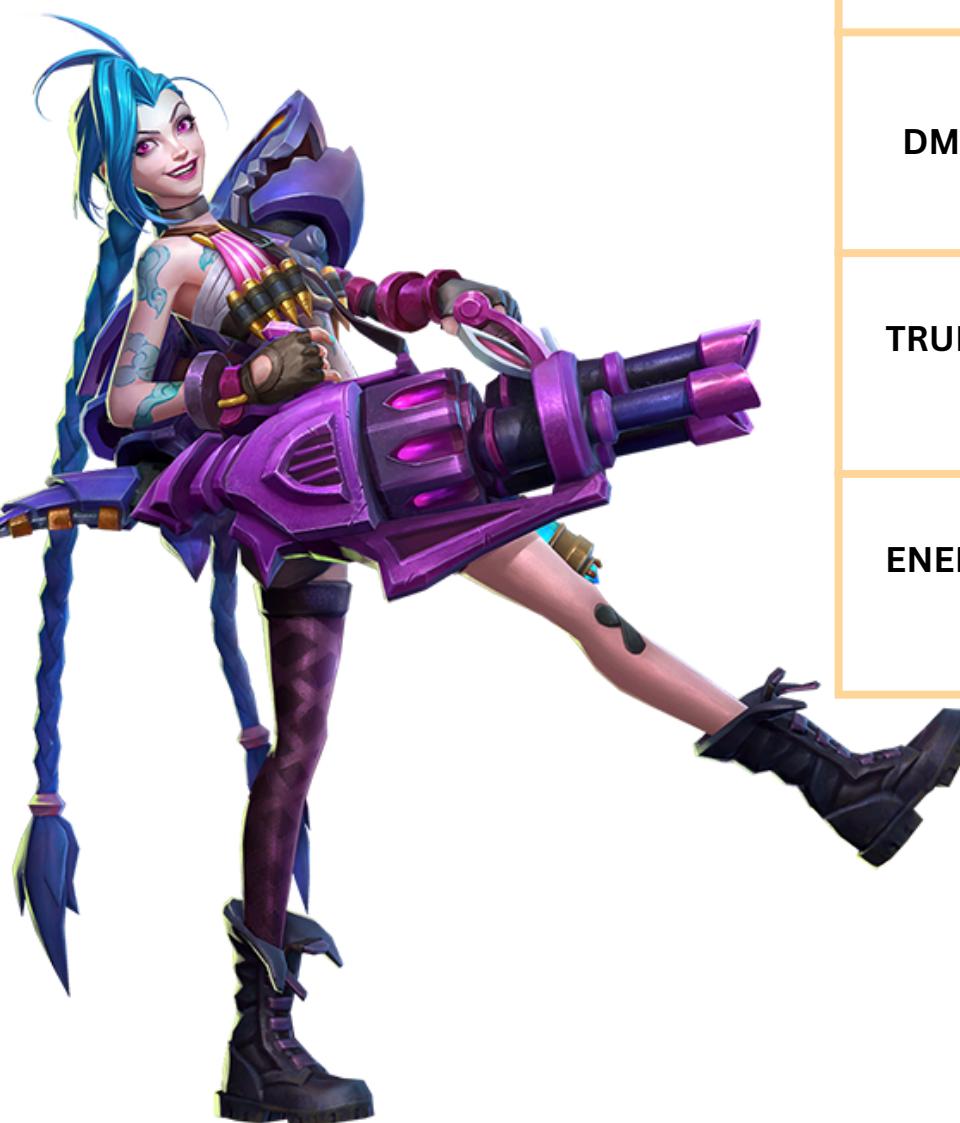
## PARTICIPANTS

ID	MATCHID	PLAYER
CHAPIONID	SS1	SS2
ROLE	POSITION	

## MATCHES

ID	GAMEID	PLATFORMID
QUEUEID	SEASONID	DURATION
CREATION	VERSION	

# STATS



ID	WIN	ITEM1	ITEM2	ITEM3	ITEM4	ITEM5	ITEM6
TRINKET	KILLS	DEATHS	ASSISTS	LARGESTKILLIN GSPREE	LARGESTMULTI KILL	KILLINGSPREES	LONGESTTIMES PENTLIVING
DOUBLEKILL	TRIPLEKILL	QUADRAKILL	PENTAKILL	LEGENDERYKILL	TOTDMGDEALT	MAGICDMGDEA LT	PHYSICALDMG DEALT
TRUEDMGDEAL T	LARGESTCRIT	TOTDMGTOCHA MP	MAGICDMGTOC HAM	PHYSDMGTOCH AMP	TRUEDMGTOCH AMP	TOTHEAL	TOTUNITHEAL
DMGSELFMIT	DMGTOOBJ	DMGTOTURRET S	VISIONSCORE	TIMECC	TOTDMGTAKEN	MAGICDMGTAK EN	PHISDMGTAKEN
TRUEDMGTAKEN	GOLDEARNED	GOLDSPENT	TURRETKILLS	INHIBKILLS	TOTMINIONSKIL LED	NEUTALMINION SKILLED	OWNJUNGLEKIL LS
ENEMYJUNGLE KILLS	TOTCCTIMEDEA LT	CHAMPLVL	PINKSBOUGHT	WARDSBOUGHT	WARDSPLACED	WARDSKILLED	FIRSTBLOOD



# Preprocessing

- Drop missing
- Drop unused columns



Drop matches with missing statistics

Drop matches with missing player entries

**Result:** All entries are complete, no missing data

Dataset optimized for queries

# Columns: League of Legends Ranked Matches

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HARRYKILLS	FIRSTINHIBITOR	FIRSTBARON
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INHIBITORKILLS		

## TEAMBANS

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## CHAMPS

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## PARTICIPANTS

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CHAMPIONID	SS1	SS2
ROLE	POSITION	

## MATCHES

ID	GAMEID	PLATFORMID
QUEUEID	SEASONID	DURATION
CREATION	VERSION	

# STATS

ID	WIN	ITEM1	ITEM2	ITEM3	ITEM4	ITEM5	ITEM6
TRINKET	KILLS	DEATHS	ASSISTS	LARGESTKILLINGSPREE	LARGESTMULTIKILL	KILLINGSPREES	LONGESTTIMESENTLIVING
DOUBLEKILL	TRIPLEKILL	QUADRAKILL	PENTAKILL	LEGENDERYKILL	TOTDMGDEALT	MAGICDMGDEALT	PHYSICALDMGDEALT
TRUEDMGDEALT	LARGESTCRIT	TOTDMGTOCHAMP	MAGICDMGTOCHAMP	PHYSDMGTOCHAMP	TRUEDMGTOCHAMP	TOHEAL	TOTUNITHEAL
DMGSELFMIT	DMGTOOBJ	DMGTOTURRETS	VISIONSCORE	TIMECC	TOTDMGTAKEN	MAGICDMGTAKEN	PHISDMGTAKEN
TRUEDMGTAKEN	GOLDEARNED	GOLDSPENT	TURRETKILLS	INHIBKILLS	TOTMINIONSKILLED	NEUTRALMINIONSKILLED	OWNJUNGLEKILLS
ENEMYJUNGLEKILLS	TOTCCTIMEDEALT	CHAMPLVL	PINKSBOUGHT	WARDSBOUGHT	WARDSPLACED	WARDSKILLED	FIRSTBLOOD

# Used columns: semantics, types, range value

## CHAMPS

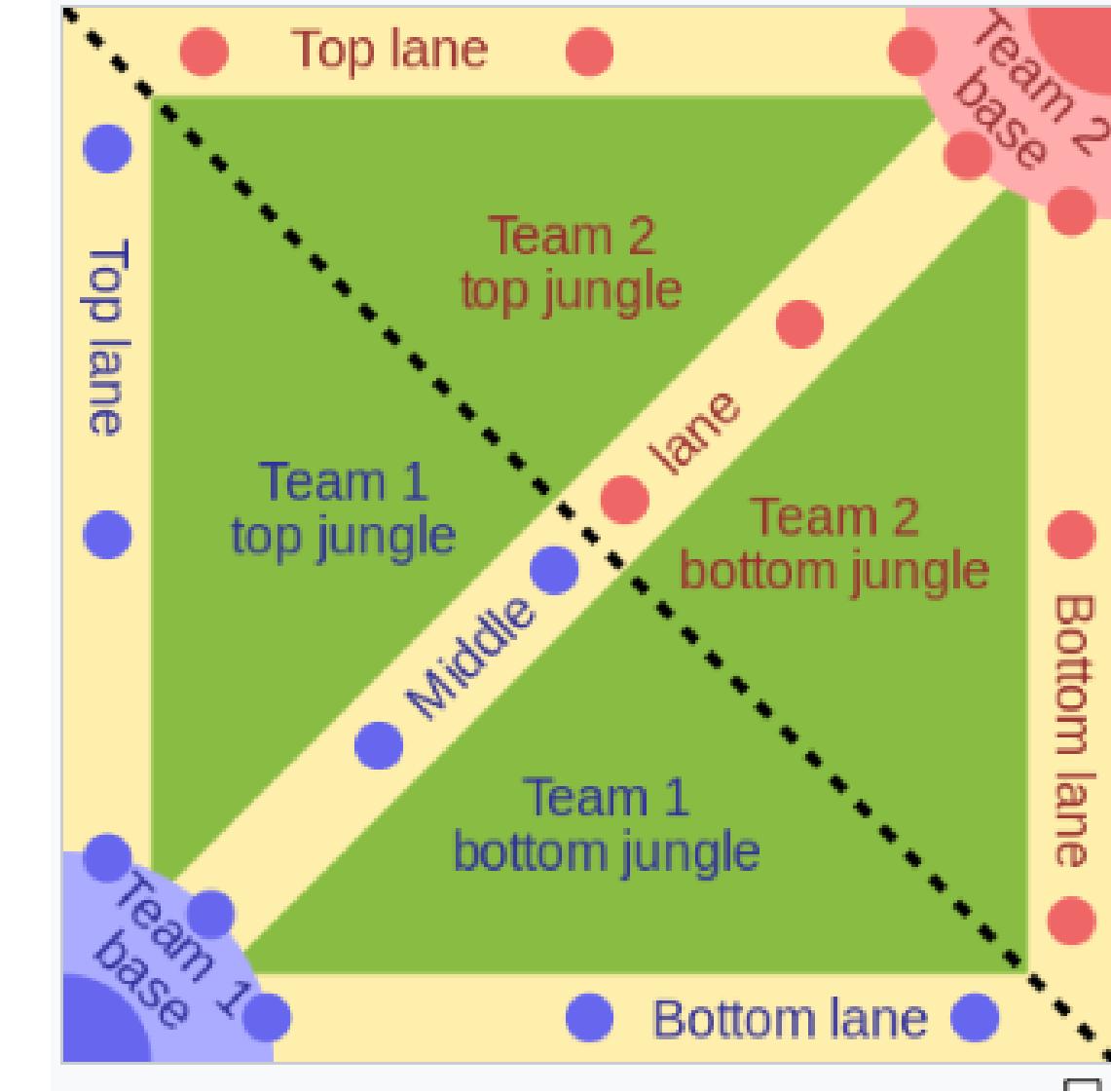
- ID - id of champion, integer, (1-516)
- Name - champion name, string, unique

## MATCHES

- ID - id of match, integer, (10-188k)
- Platform - name of server, string, (EUN, EUW, NA..)
- Duration - match duration in seconds, integer, (190-4991)

## PARTICIPANTS

- ID - participant id
- MatchID - id of match
- Player - (1-5 blue team, 6-10 red team)
- Champion ID -
- SS1 - summoner spell on D
- SS2 - summoner spell on F
- Role - (SOLO = top and mid, NONE = jungle, DUO\_CARRY or DUO\_SUPPORT = bot)
- Position - (bot/jungle/top/mid)



# Used columns: semantics, types, range value

## TEAMSTATS

- Match ID - Id of a match
- Team ID - Team id, integer (100 for blue or 200 for red team)
- First blood - 1 if the team made first blood, 0 if it did not
- First turret - 1 if the team destroyed first turret, 0 if it did not
- First inhibitor - 1 if the team destroyed first inhibitor, 0 if it did not
- First baron - 1 if the team first killed baron, 0 if it did not
- First dragon - 1 if the team first killed dragon, 0 if it did not
- First herald - 1 if the team first killed herald, 0 if it did not
- Tower kills - Number of towers destroyed by the team, integer (0 - 16)
- Inhibitor kills - Number of inhibitors destroyed by the team, integer (0 - 13)
- Baron kills - Number of barons killed by the team, integer (0 - 5)
- Dragon kills - Number of dragons killed by the team, integer (0 - 7)
- Harry kills - Number of heralds killed by the team, integer (0 - 2)

## TEAMBANS

- Match ID - Id of a match
- Team ID - Team Id
- Champion ID - Champion Id

# Used columns: semantics, types, range value

## STATS

- ID - Id of a stats, integer (9 -1.3M)
- Win - Was a player part of a winning team (1 - yes, 0 - no)
- Item 1 - id of an item, integer (1 - 3933)
- Item 2 - id of an item, integer (1 - 3933)
- Item 3 - id of an item, integer (1 - 3933)
- Item 4 - id of an item, integer (1 - 3933)
- Item 5 - id of an item, integer (1 - 3933)
- Item 6 - id of an item, integer (1 - 3933)
- Kills - Number of kills, integer (0 - 43)
- Deaths - Number of deaths, integer (0 - 33)
- Assists - Number of assists, integer (0 - 57)
- TotDmgDealt - Total damage dealt, integer (0 - 1.06M)
- magicDmgDealt - Total magic damage dealt, integer (0 - 677K)
- PhysicalDmgDealt -Total physical damage dealt, integer (0 - 918K)
- TrueDmgDealt - Total true damage dealt, integer (0 - 663K)
- TotDmgToChamp -Total damage dealt to champions, integer (0 - 153K)
- VisionScore - Score gained for placing wards, integer (0 - 179)
- TotDmgTaken - Total damage taken, integer (0 - 160K)



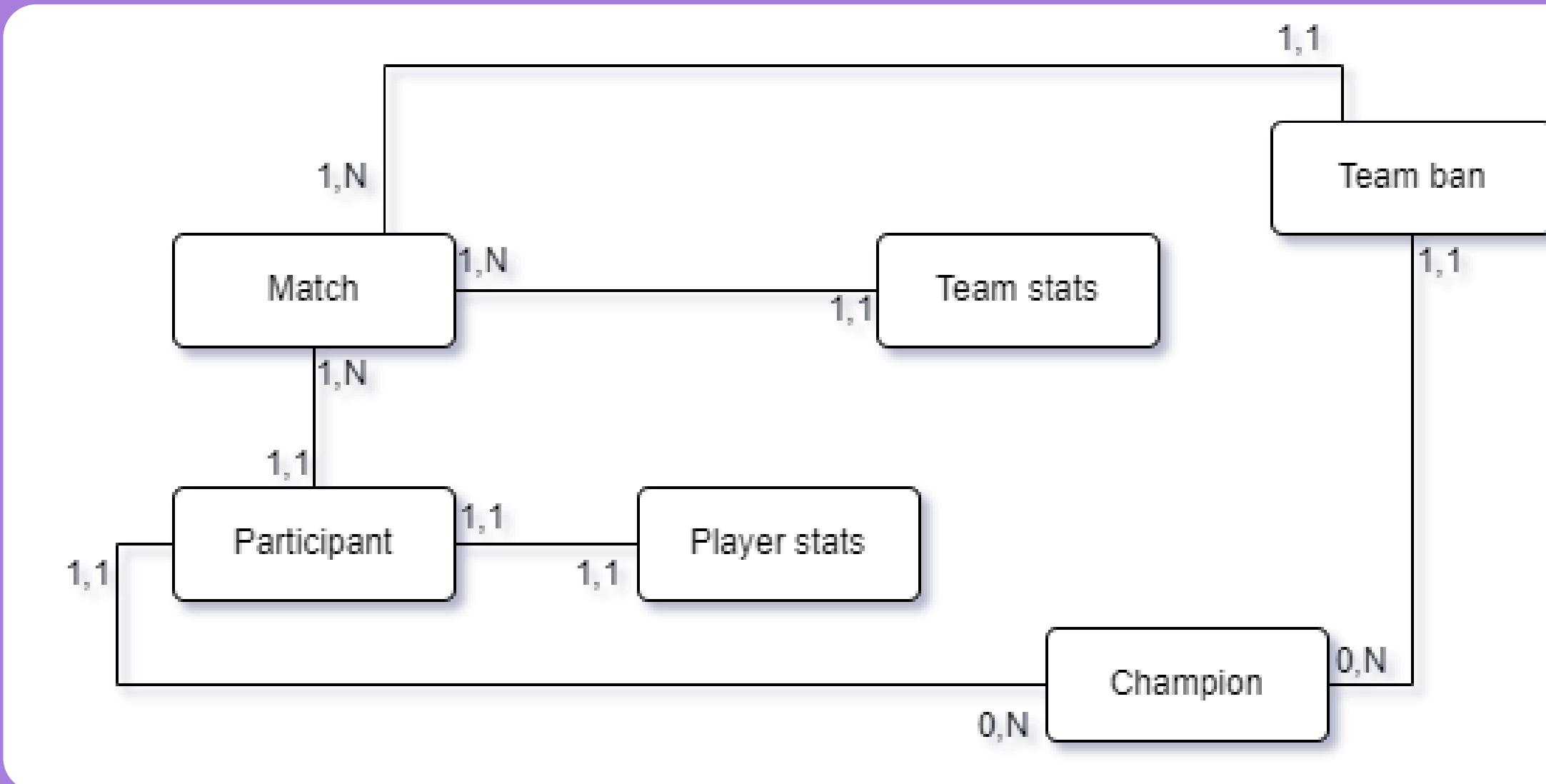
# Used columns: semantics, types, range value

STATS(Continuation from the previous page)

- GoldEarned - Total gold earned, integer (643 - 41K)
- GoldSpent - Total gold spent, integer (0 - 70.3K)
- InhibKills - Number of inhibitors destroyed, integer (0 - 7)
- TotMinionsKilled - Number of minions killed, integer (0 - 650)
- NeutralMinionsKilled - Number of neutral minions killed, integer (0 - 288)
- OwnJungleKills - Number of minions killed in own jungle, integer (0 - 166)
- EnemyJungleKills - Number of minions killed in enemy jungle, integer (0 - 168)
- FirstBlood - Did the player made a first blood (1 if yes, 0 if no)



# Data propagation through files



# Initial schema

Fields	Global Probability	Type
league_of_legends.teambar	100.0%	Collection
_id	100.0%	ObjectId
championid	100.0%	Int32
matchid	100.0%	Int32
teamid	100.0%	Int32

Fields	Global Probability	Type
league_of_legends.teamsta	100.0%	Collection
_id	100.0%	ObjectId
baronkills	100.0%	Int32
dragonkills	100.0%	Int32
firstbaron	100.0%	Int32
firstblood	100.0%	Int32
firstdragon	100.0%	Int32
firstrarry	100.0%	Int32
firstinhib	100.0%	Int32
firsttower	100.0%	Int32
harrykills	100.0%	Int32
inhibkills	100.0%	Int32
matchid	100.0%	Int32
teamid	100.0%	Int32
towerkills	100.0%	Int32

Fields	Global Probability	Type
league_of_legends.players	100.0%	Collection
_id	100.0%	ObjectId
assists	100.0%	Int32
deaths	100.0%	Int32
enemyjunglekills	100.0%	Int32
firstblood	100.0%	Int32
goldearned	100.0%	Int32
goldspent	100.0%	Int32
id	100.0%	Int32
inhibkills	100.0%	Int32
item1	100.0%	Int32
item2	100.0%	Int32
item3	100.0%	Int32
item4	100.0%	Int32
item5	100.0%	Int32
item6	100.0%	Int32
kills	100.0%	Int32
magicdmgdealt	100.0%	Int32
matchid	100.0%	Int32
neutralminionskilled	100.0%	Int32
ownjunglekills	100.0%	Int32
physicaldmgdealt	100.0%	Int32
totdmgdealt	100.0%	Int32
totdmgtaken	100.0%	Int32
totdmgtochamp	100.0%	Int32
totminionskilled	100.0%	Int32
truedmgdealt	100.0%	Int32
visionscore	100.0%	Int32
win	100.0%	Int32

Fields	Global Probability	Type
league_of_legends.champs	100.0%	Collection
_id	100.0%	ObjectId
id	100.0%	Int32
name	100.0%	String

Fields	Global Probability	Type
league_of_legends.matches	100.0%	Collection
_id	100.0%	ObjectId
duration	100.0%	Int32
id	100.0%	Int32
platformid	100.0%	String

Fields	Global Probability	Type
league_of_legends.participa	100.0%	Collection
_id	100.0%	ObjectId
championid	100.0%	Int32
id	100.0%	Int32
matchid	100.0%	Int32
player	100.0%	Int32
position	100.0%	String
role	100.0%	String
ss1	100.0%	Int32
ss2	100.0%	Int32



# Possible questions

- What is the impact of jungle resource management on match outcomes?
- What are the 10 most frequently used items and their impact on average damage?
- Which roles are most effective based on economy?



- What is the impact of the first objectives (first blood, first tower, first inhibitor, first baron, first dragon) on the outcome of the match?
- What are the 10 most frequently used items in winning matches and their impact on performance?

# Possible questions

- What are the top 10 most commonly picked champion combinations on BOT lane and how do these combinations affect the win rate?
- What is the most used summoner spell on every platform? On what key is it set on every platform?
- For every champion, what is their average KDA ratio based on what side they are playing, and how does it affect the match duration?



- What is the main damage type dealt for every champion played on MID lane on blue side? How often does the red side have champions on the same lane with the same damage type?
- For the top 10 most banned champions, what is their average win rate compared to the win rate of the team that banned that champion?

- Attribute pattern
- Extended reference

# Design patterns



# Attribute pattern

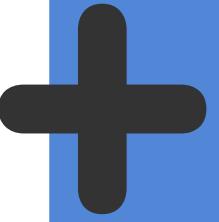
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▼{  
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    "item1" : NumberInt(2301),  
    "item2" : NumberInt(3111),  
    "item3" : NumberInt(3190),  
    "item4" : NumberInt(3107),  
    "item5" : NumberInt(0),  
    "item6" : NumberInt(0),  
    "kills" : NumberInt(0),  
    "deaths" : NumberInt(2),  
    "assists" : NumberInt(12),  
    "totdmgdealt" : NumberInt(25995),  
    "magicdmgdealt" : NumberInt(17633),  
    "physicaldmgdealt" : NumberInt(6295),  
    "truedmgdealt" : NumberInt(2066),  
    "totdmgtochamp" : NumberInt(8478),  
    "visionscore" : NumberInt(30),  
    "totdmgtaken" : NumberInt(17769),  
    "goldearned" : NumberInt(9496),  
    "goldspent" : NumberInt(7975),  
    "inhibkills" : NumberInt(0),  
    "totminionskilled" : NumberInt(17),  
    "neutralminionskilled" : NumberInt(1),  
    "ownjunglekills" : NumberInt(1),  
    "enemyjunglekills" : NumberInt(0),  
    "firstblood" : NumberInt(0),  
    "matchid" : NumberInt(10)  
}
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▼{  
    "_id" : ObjectId("665cb801ea19b3bd3fa09fe2"),  
    "id" : NumberInt(10),  
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    "totdmgtochamp" : NumberInt(8478),  
    "visionscore" : NumberInt(30),  
    "totdmgtaken" : NumberInt(17769),  
    "inhibkills" : NumberInt(0),  
    "totminionskilled" : NumberInt(17),  
    "neutralminionskilled" : NumberInt(1),  
    "ownjunglekills" : NumberInt(1),  
    "enemyjunglekills" : NumberInt(0),  
    "firstblood" : NumberInt(0),  
    "matchid" : NumberInt(10),  
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        "total" : NumberInt(25995),  
        "magic" : NumberInt(17633),  
        "physical" : NumberInt(6295),  
        "true" : NumberInt(2066)  
    },  
    "gold" : {  
        "earned" : NumberInt(9496),  
        "spent" : NumberInt(7975)  
    },  
    "items" : {  
        "item1" : NumberInt(2301),  
        "item2" : NumberInt(3111),  
        "item3" : NumberInt(3190),  
        "item4" : NumberInt(3107),  
        "item5" : NumberInt(0),  
        "item6" : NumberInt(0)  
    },  
    "performance" : {  
        "kills" : NumberInt(0),  
        "deaths" : NumberInt(2),  
        "assists" : NumberInt(12)  
    }  
}
```

# Extended reference

```
_id" : ObjectId("665cb801ea19b3bd3fa09fe2"),
"id" : NumberInt(10),
"win" : NumberInt(0),
"item1" : NumberInt(2301),
"item2" : NumberInt(3111),
"item3" : NumberInt(3190),
"item4" : NumberInt(3107),
"item5" : NumberInt(0),
"item6" : NumberInt(0),
"kills" : NumberInt(0),
"deaths" : NumberInt(2),
"assists" : NumberInt(12),
"totdmgdealt" : NumberInt(25995),
"magicdmgdealt" : NumberInt(17633),
"physicaldmgdealt" : NumberInt(6295),
"truedmgdealt" : NumberInt(2066),
"totdmgtochamp" : NumberInt(8478),
"visionscore" : NumberInt(30),
"totdmgtaken" : NumberInt(17769),
"goldearned" : NumberInt(9496),
"goldspent" : NumberInt(7975),
"inhibkills" : NumberInt(0),
"totminionskilled" : NumberInt(17),
"neutralminionskilled" : NumberInt(1),
"ownjunglekills" : NumberInt(1),
"enemyjunglekills" : NumberInt(0),
"firstblood" : NumberInt(0),
"matchid" : NumberInt(10)
```



```
_id" : ObjectId("665cb7deea19b3bd3f84c5e1"),
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"matchid" : NumberInt(10),
"player" : NumberInt(2),
"championid" : NumberInt(267),
:ss1" : NumberInt(3),
:ss2" : NumberInt(4),
"role" : "DUO_SUPPORT",
"position" : "BOT"
```

```
_id" : ObjectId("665cb801ea19b3bd3fa09fe2"),
"id" : NumberInt(10),
"win" : NumberInt(0),
"totdmgtochamp" : NumberInt(8478),
"visionscore" : NumberInt(30),
"totdmgtaken" : NumberInt(17769),
"inhibkills" : NumberInt(0),
"totminionskilled" : NumberInt(17),
"neutralminionskilled" : NumberInt(1),
"ownjunglekills" : NumberInt(1),
"enemyjunglekills" : NumberInt(0),
"firstblood" : NumberInt(0),
"matchid" : NumberInt(10),
"playerinformation" : {
  "player" : NumberInt(2),
  "championid" : NumberInt(267),
  "ss1" : NumberInt(3),
  "ss2" : NumberInt(4),
  "role" : "DUO_SUPPORT",
  "position" : "BOT"
},
"damage" : {
  "total" : NumberInt(25995),
  "magic" : NumberInt(17633),
  "physical" : NumberInt(6295),
  "true" : NumberInt(2066)
},
"gold" : {
  "earned" : NumberInt(9496),
  "spent" : NumberInt(7975)
},
"items" : {
  "item1" : NumberInt(2301),
  "item2" : NumberInt(3111),
  "item3" : NumberInt(3190),
```



# Thank you!



Questions? 😱😊