Part 3 Group 07 Hugo Rocha Report

Write in common language each rule and detail, using RDF-Turtle Syntax, how it was implemented

Common language 1:

In the nba a player has some attributes like height, weight, jersey number, country and it plays for only one team. In a nba team we know it's name, abbreviation and nickname. Each team plays in a certain city and arena. And we also know the year the team was formed. A team has a president to run the office and a head coach to manage the team. It also has various assistant Coaches to help with various situations in helping the head coach in its decisions.

Rules:

NBA Player: it is a basketball player, which is a Sports player, which is a Player.

```
:NbaPlayer rdfs:subClassOf :BasketBallPlayer .
:BasketBallPlayer rdfs:subClassOf :SportsPlayer .
:SportsPlayer rdfs:subClassOf :Player .
:Player rdf:type owl:Class .
```

Figure 1: Protégé Player Class

A player has a Name, Country, Height, Weight , Jersey Number and Position.

```
:playerHeight rdf:type owl:DatatypeProperty ;
              rdfs:domain :Player ;
              rdfs:range xsd:int .

:playerJerseyNumber rdf:type owl:DatatypeProperty ;
                    rdfs:domain :Player ;
                    rdfs:range xsd:positiveInteger .

:playerName rdf:type owl:DatatypeProperty ;
            rdfs:domain :Player ;
            rdfs:range xsd:string .
```

```
:playerPosition rdf:type owl:DatatypeProperty ;
                rdfs:range xsd:string .

:playerWeight rdf:type owl:DatatypeProperty ;
              rdfs:domain :Player ;
              rdfs:range xsd:float .



:playerNacionality rdf:type owl:ObjectProperty ;
                rdfs:domain :Player ;
                rdfs:range :Country .
```

Note that a player Nationality it as a range a class Country which is a subclass of Location

```
:Country rdf:type owl:Class ;
         rdfs:subClassOf :Location .
```

A player only plays for one nba team.

First thing is to create a NbaTeam Class, which is a SportsTeam which is a Team.

Then create that Object property playsIn. And do the restriction that a player can only play in one team.

```
:playsIn rdf:type owl:ObjectProperty ;
         rdfs:domain :Player ;
         rdfs:range :Team .

:Player rdf:type owl:Class ;
        owl:equivalentClass [ rdf:type owl:Restriction ;
                              owl:onProperty :playsIn ;
                              owl:qualifiedCardinality "1"^^xsd:nonNegativeInteger ;
                              owl:onClass :Team
                            ] .
```

Figure 3: Description of Player

A NbaTeam as name, abbreviation, arena, city, nickname, year it was founded, a president, a coach and it has some assistant Coaches as well.

```
:teamAbbreviation rdf:type owl:DatatypeProperty ;
                  rdfs:domain :Team ;
                  rdfs:range xsd:string .

:teamName rdf:type owl:DatatypeProperty ;
          rdfs:domain :Team ;
          rdfs:range xsd:string .

:teamNickname rdf:type owl:DatatypeProperty ;
              rdfs:domain :Team ;
              rdfs:range xsd:string .

:teamYearFounded rdf:type owl:DatatypeProperty ;
                 rdfs:domain :Team ;
                 rdfs:range xsd:int .


:teamCity rdf:type owl:ObjectProperty ;
          rdfs:domain :Team
          rdfs:range :City .
```

Figure 5 Class City is a subClass of Location

```
:teamArena rdf:type owl:ObjectProperty ;
           rdfs:domain :Team
           rdfs:range :Arena .
```

teamArena as a range Arena which is a Class. With this class it was created the arenaCapacity to know the capacity of each arena.

```
:arenaCapacity rdf:type owl:DatatypeProperty ;
               rdfs:domain :Arena ;
               rdfs:range xsd:int .
```

“A team has a president to run the office and a head coach to manage the team. It also has various assistant Coaches to help with various situations in helping the head coach in its decisions.”

It was created the class NbaWorker.

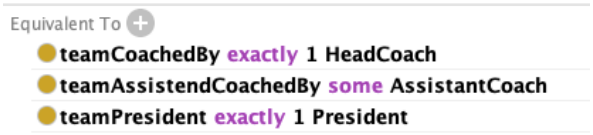
```
:NbaWorker rdf:type owl:Class .

:President rdf:type owl:Class ;
        rdfs:subClassOf :NbaWorker .

:HeadCoach rdf:type owl:Class ;
        rdfs:subClassOf :NbaWorker .

:AssistantCoach rdf:type owl:Class ;
            rdfs:subClassOf :NbaWorker .
```

Then we have to put a equivalent Class on NbaTeam saying that it can only have one head coach, some assistant coaches and exactly one president.




```
:NbaTeam rdf:type owl:Class ;
        owl:equivalentClass [ rdf:type owl:Restriction ;
                              owl:onProperty :teamAssistendCoachedBy ;
                              owl:someValuesFrom :AssistantCoach
                            ] ,
                            [ rdf:type owl:Restriction ;
                              owl:onProperty :teamCoachedBy ;
                              owl:qualifiedCardinality "1"^^xsd:nonNegativeInteger ;
                              owl:onClass :HeadCoach
                            ] ,
                            [ rdf:type owl:Restriction ;
                              owl:onProperty :teamPresident ;
                              owl:qualifiedCardinality "1"^^xsd:nonNegativeInteger ;
                              owl:onClass :President
                            ] ,
```

Common language 2:

In the nba there are two types of games. The regular season games and playoff games. Once a year there is a all-star game it is a basketball exhibition game with the best players (called all-star players).
In a nba game you know the points scored by each team and who's playing who. In the nba some people will receive awards.
As for awards if you win the mvp (most value player) you are a mvp winner. If you win a rookie you are rookie winner. If you win a coach of the year you are a awardwinnig coach.

At the end of the day the goal of the nba is to win the championship, if you do that you are a championshipwinner.

An Nba Game it can be Of the regular season, playoffgame, allStargame

Figure 2 Game Class

A game has a date, homeTeam, awayTeam, pts home, pts away

```
:gameDate rdf:type owl:DatatypeProperty ;
        rdfs:domain :Game ;
        rdfs:range xsd:dateTimeStamp .


:gamePtsHome rdf:type owl:DatatypeProperty ;
           rdfs:domain :Game ;
           rdfs:range xsd:int .
:gamePtsAway rdf:type owl:DatatypeProperty ;
           rdfs:domain :Game ;
           rdfs:range xsd:int .
:gameHomeTeam rdf:type owl:ObjectProperty ;
            rdfs:domain :NbaGame ;
            rdfs:range :NbaTeam .

:gameAwayTeam rdf:type owl:ObjectProperty ;
            rdfs:domain :NbaGame ;
            rdfs:range :NbaTeam .
```

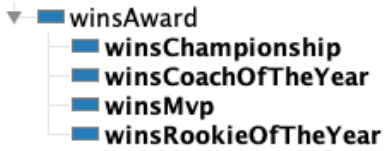
AllstarGame
In the nba if you play on an all-star game you are an all-star player.

To do this it was created a class allstar player :

```
:AllStarPlayer rdf:type owl:Class ;
               owl:equivalentClass [ rdf:type owl:Restriction ;
                                     owl:onProperty :playsAllStarGame ;
                                     owl:someValuesFrom :AllStarGame
                                   ] ;
               rdfs:subClassOf :NbaPlayer .
```

Awards

It was created the winsAward object property to help distinguished who is an award winner.



For the NBAPlayer Class has to be restructure:

If you win a championship you are championship winner.

```
:ChampionshipWinner rdf:type owl:Class ;
                    owl:equivalentClass [ rdf:type owl:Restriction ;
                                          owl:onProperty :winsChampionship ;
                                          owl:someValuesFrom :Championship
                                        ] ;
                    rdfs:subClassOf :NbaPlayer .
```

If you win a mvp you are mvp winner.

```
:MvpWinner rdf:type owl:Class ;
        owl:equivalentClass [ rdf:type owl:Restriction ;
                              owl:onProperty :winsMvp ;
                              owl:someValuesFrom :Mvp
                            ] ;
        rdfs:subClassOf :NbaPlayer .
```

If you win a rookie you are rookie winner.

```
:RookieWinner rdf:type owl:Class ;
           owl:equivalentClass [ rdf:type owl:Restriction ;
                                 owl:onProperty :winsRookieOfTheYear ;
                                 owl: someValuesFrom:RookieOfTheYear
                               ] ;
           rdfs:subClassOf :NbaPlayer .
```

If you win a coach you are awardwinnig coach winner.

```
:AwardWinningCoach rdf:type owl:Class ;
                owl:equivalentClass [ rdf:type owl:Restriction ;
                                      owl:onProperty :winsCoachOfTheYear ;
                                      owl:someValuesFrom :CoachOfTheYear
                                    ] ;
                rdfs:subClassOf :HeadCoach .
```

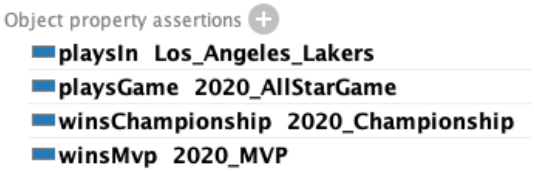
2.Report the process of verification that ontology rules are being executed by running a reasoner (within Protegé or Fuseki) over good and correct data sets and incorrect data sets

It was used hermit in Protegé.

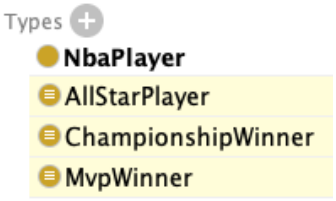
To verify if the rules are being executed first it was created some individuals.

Individual	Type
2020_LebronJames	NBAPlayer
2020_Championship	Championship
2020_MVP	Mvp
2020_AllStarGame	AllStarGame
Los_Angeles_Lakers	NbaTeam

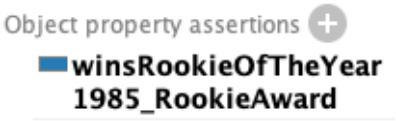
Then it was put that the player Lebron James did all this things:



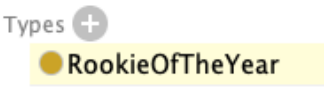
The result by running the reasoner it was inferred that 2020_LebronJames is an All-star Player, Championship Winner and MVP winner without saying it.



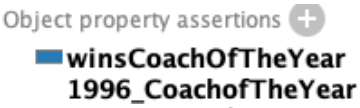
To demonstrate the RookieWinner inference it was created the Individual 1985_MichaelJordan which won RookieOfTheYear in 1985. The individual 1985_RookieAward was also created but nothing was said.



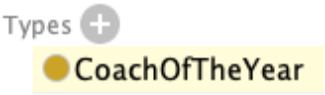
The by running the reasoner it was inferred that 1985_MichaelJordan is a RookieWinner.
And that 1985_RookieAward is RookieOfTheYear Award.



To demonstrate the CoachofTheYear inference it was created the Individual 1996_PhilJackson which won the Coach of the year award in 1996. The individual 1996_CoachofTheYear was also created but nothing was said.



The by running the reasoner it was inferred that 1996_PhilJacksonis a AwardWinningCoach.
And that 1996_CoachofTheYearis CoachOfTheYear Award.



For an **incorrect** data sets example It was said that the NbaTeam Lakers won the 2020_MVP. So by running the reasoner it was inferred that the lakers are MvpWinner which is the same as saying that it is an NbaPlayer. It is incorrect information