Q-1 $K = \{ Vegan \equiv Person \sqcap \forall eats.Plant,\ Vege \equiv Person \sqcap \forall eats.(Plant \sqcup Dairy) \}$

To prove $K \models Vegan \sqsubseteq Vege$

~~$\neg(\neg Vegan \sqcup Vege)$~~

$\Rightarrow Vegan \sqcap \neg Vege.$

Converting K to NNF

$NNF(K) := \{ \neg Vegan \sqcup (Person \sqcap \forall eats.Plant),\ Vegan \sqcup (\neg Person \sqcup \exists eats.(\neg Plant)),$

$\neg Vege \sqcup (Person \sqcap \forall eats.(Plant \sqcup Dairy)),\ Vege \sqcup \neg(Person \sqcap \forall eats.$

$(Plant \sqcup Dairy)) \}$

Considering ~~a~~ an element a.

~~$\mathcal{L}(a) = \{ \neg Vegan \sqcap Vege,\ \neg Vegan, Vege$~~

$\mathcal{L}(a) = \{ Vegan \sqcap \neg Vege, Vegan, \neg Vege, \neg Vegan \sqcup (Person \sqcap \forall eats.Plant),$

~~$\neg Vegan$~~, $Person \sqcap \forall eats.Plant,\ Vege \sqcup \neg(Person \sqcap \forall eats.$

$(Plant \sqcup Dairy)),$

$\neg Person \sqcup \exists eats.(\neg Plant \sqcap \neg Dairy) \}$

$L(a) = \{ \text{Vegan} \sqcap \neg\text{Vege}, \text{Vegan}, \neg\text{Vege}, \neg\text{Vegan} \sqcup (\text{Person} \sqcap \forall \text{eats}. \text{Pl}$

$\text{Person} \sqcap \forall \text{eats}. \text{Plant}$, $\text{Vege} \sqcup \neg(\text{Person} \sqcap \forall \text{eats}. (\text{Plant} \sqcup \text{Dairy})$

$\neg\text{Person} \sqcup \exists \text{eats}. (\neg\text{Plant} \sqcap \neg\text{Dairy})$, Person, $\forall \text{eats}. \text{Plant}$

$\exists \text{eats}. (\neg\text{Plant} \sqcap \neg\text{Dairy})$

eats.

$L(b) = \{ \neg\text{Plant} \sqcap \neg\text{Dairy}, \neg\text{Plant}, \neg\text{Dairy}, \forall \cdot \text{Plant} \}$.

Since there's a contradiction, Our tableau closed.

We know that $\text{Vegan} \sqsubseteq \text{Vege}$ is a logical consequence.

(2)

Assignment - 3

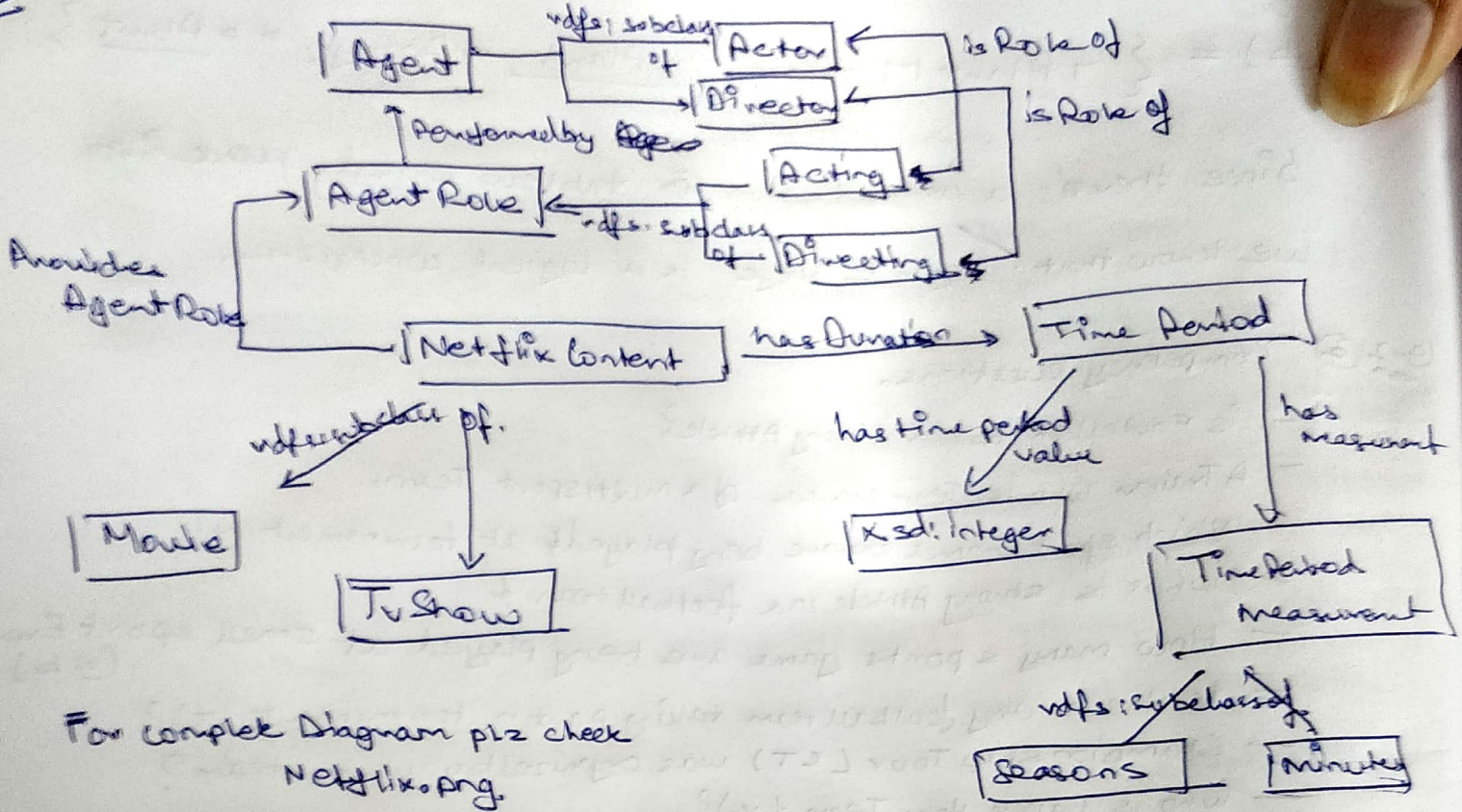
Q-2

1. Team $\sqsubseteq \geq 1$ takesPartIn. ChampionshipTour
2. ChampionshipTour $\sqsubseteq \exists$ organizedBy. Team $\sqcap \exists$ consistOf. Tournament
3. Tournament $\sqsubseteq \exists$ belongsTo. ChampionshipTour
4. Sportsman $\equiv \exists$ plays. SportGame.
5. TeamMember $\equiv$ Sportsman $\sqcap \exists$ playsFor. Team
6. StrongAthlete $\equiv$ (Sportsman $\sqcap$ TeamMember) $\sqcup \geq 3$ plays.
7. Footballer $\sqsubseteq \exists$ playsFor. FootballTeam
8. Trainer $\sqsubseteq \exists$ responsibleFor. Team
9. Master $\equiv$ Sportsman $\sqcap$ Trainer
10. SportGame. $\sqsubseteq \exists$ isplayedAt. Tournament
11. TeamSport $\equiv$ SportGame $\sqcap \exists$ hasWinner. Team
12. PopularSport $\sqsubseteq$ (SportGame $\sqcap \geq 2$ playedAt. Tournament)
13. MultisportTeam $\equiv \geq 2$ plays. SportGame
14. InterestingTournament $\equiv \exists$ hasWinner. DebutTeam
15. SmallSportEvent $\equiv \leq 2$ includes. SportGame $\sqcap$ Tournament

Q-2 (2) Competency Questions.

- is Footballer (fb) a strong Athlete?
- A Trainer who is Team-member of a multisport Team.
- Which sport Games are being played at tournament (t).
- who is strong Athlete in a football team ?
- How many sports game are being played at small sport Event (sb)?
- Is there any football team taking part in tournament (t)?
- Championship Tour (CT) was organized by which team?
- who is Trainer for Team (x)?
- Which tournaments belongs to a championship Tour (CT)?
- Is master(m) a strong Athlete?

Q-3



For complete Diagram plz check Netflix.png.

Thing
- Concept
  - Role
    - Acting
    - Directing
  - Country
  - Genre
  - Netflix Content
    - Movie
    - TvShow
- Object
  - Agent
    - Person
      - Actor
      - Director

Anti Rigid
Rigid
Identity
Anti Rigid

- Time Period
- Time period measurement
  - Minutes
  - Seasons

Anti Rigid.

Q-4 Main difference I observed was that OWL API gave many form of axioms, few of the Relations were subclass of, Object Min Cardinality Object Property Domain etc.

Whereas OWL Explanation API gave only axioms having subclass of relation.