

CS6852 Assignment 1: Ontology Design

Group 10 ,

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Submitted to:

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Design Choice and Details:

Domain-Name : University

Motivation:

We are students since the past 22+ years, basically it's our whole life we can relate the ideas of this system, it working and now being part of such an Institute and learning ontologies drives us to choose this topic. We chose those Concept names, Roles for our domain, which we were seeing in our regular life there at IITM. Further, exploring the university domain enriches our knowledge about various roles and functionalities of University.

And in the end we come up with the following University Ontology.

CONCEPTS:

S.no	Concept name	Description
1	Program	University offers bachelor's (Btech , Dual-Degree), master's, and doctoral Degrees. This is atomic concept
2	Person	All the people related to University. This is atomic concept
3	Website	Contains All information about university. This is an atomic concept
4	Department	A division of a university where a professor/faculty is devoted to a particular academic discipline. This is atomic concept
5	TA	A teaching assistant is a student who assist a Faculty with at least one course
6	Course	All the courses in the University. This is atomic concept

7	UGCourse	All the courses related to the undergraduate program.
8	PGCourse	All the courses related to the postgraduate program.
9	MSCourse	All courses related to the Master of Science program.
10	Student	All persons in the University who attends at least one course
11	UGStudent	UGStudent is a Student who attends only UGCourses.
12	PGStudent	PGStudent is a Student who attends at least one PGCourse.
13	MSStudent	A student who attends at least one MSCourse
14	SponsoredStudent	A PGStudent who is not a TA.
15	GraduateStudent	A person who has degree of a program
16	Publication	All the Research works published by students or faculty.
17	Event	All Events holds in the university. This is an atomic concept
18	DepartmentEvent	All Events which are organized by any department
19	Club	All clubs in the university. This is an atomic concept
20	ClubEvent	All Events which are organized by any club
21	Exam	Department Event which are conducted by Faculty.
22	ResearchAssistant	PGStudent or UGStudent who helps the Professor in the research work
23	HOD	A Person who is head of any one Department
24	Faculty	Person who teaches at least one course. Basically refers to teaching staff. This is atomic concept and belong to one Department
25	DepartmentWebsite	Website containing information regarding department
26	Website	A place on the internet where different organizations' information is present. This is an atomic concept
27	AssistantProfessor	A assistant professor is a faculty
28	AssociateProfessor	A associate professor is a faculty
29	Professor	Faculty who is neither Associate Professor nor Assistant

		Professor
30	Staff	All persons working for the university.
31	Non-Teaching staff	Employee who does not teach a course.
32	ProjectGuide	Faculty who guides at least one PGStudent
33	SportsCommittee	Organises sports events
34	CulturalCommitte	Organises Cultural events
35	CulturalEvent	All events which are organised by CulturalCommitte
36	Credits	The credits associated with a Course. This is an atomic concept
37	Hostel	an establishment provides lodging for a specific group of people, such as students. This is an atomic concept
38	Hostellers	Students who belongs to only one Hostel
39	Warden	Faculty who is head of exactly one Hostel
40	Classroom	A part of University campus, where courses are taught. This is an atomic concept
41	Laboratory	All the labs present in university. This is an atomic concept
42	LabAssistant	A person who assists ≥ 1 laboratory
43	LabAdministrator	A person who administers at least one laboratory
44	Library	All the libraries present in university. This is an atomic concept
45	LibraryStaff	People who works in a library
46	LibraryAdministrator	A person who administers a library
47	Hospital	A place where we all persons can get immediate first aid in the university. This is an atomic concept
48	HospitalStaff	People who works in a Hospital
49	Mess	All the places in university where food is provided. This is an atomic concept
50	MessStaff	All the people who work in Mess.
51	GymKhana	A part of University campus, where gym activities happen.

52	GymStaff	People works in GymKhana
53	HostelSec	All students who are secretary of a Hostel
54	PeopleRegisterdInMes	All the people who are registered in a mess
55	Security	It includes all security measures to protect/secure University. We are considering this to be an atomic axiom.
56	Threat	Any Unauthorised, misconduct happens on/to University and Its belonging.
57	Stadium	A part of University campus, where sports are played. This is an atomic concept

ROLES:

S.no	Role-Name	Domain - Range
1	teaches	Person - Course
2	attends	Person - Course
3	publishedBy publishes	Publication - Faculty □ Student Faculty □ Student - Publication
4		
5	guides	Faculty - PGStudent
6	assists	TA - Course Person - Laboratory
7	worksIn	Person - Library Person - Hospital Person - Mess Person - GymKhana
8	administratre	Lab Administrator - Laboratory Library Administrator - Library
9	belongsTo	Student - Department Student - Hostel Faculty - Department HOD - Department
10	offeredBy offers	Course - Department Department - Course
11	headOf	Faculty - Department Student - Club Staff - Hostel
12	organisedBy	Event - Department Event - Club Event - SportsCommitte Event - CulturalCommitte
13	conductedBy	Exam - Faculty
14	informationAbout	Website - University Website - Department
15	creditsFor	Course - Credits

16	hasDegree	Person - Program
17	registeredIn	People - Mess
18	breaches	Event - Security
19	protects	SecurityTeam - University

TBox:

1. Student \equiv Person $\sqcap \geq 1$ attends.Course
2. UGCourse \sqsubseteq Course
3. PGCourse \sqsubseteq Course
4. MSCourse \sqsubseteq PGCourse
5. Faculty \equiv Person $\sqcap \geq 1$ teaches.Course.
6. Graduate Student \equiv Person $\sqcap \exists$ hasDegree.Program
7. Staff \equiv Person $\sqcap \neg$ Student $\sqcap \neg$ Graduate Student
8. Non-TeachingStaff \equiv Person $\sqcap \neg \exists$ teaches.Course $\sqcap \neg$ Student.
9. AssistantProfessor \sqsubseteq Faculty
10. AssociateProfessor \sqsubseteq Faculty
11. Professor \equiv Faculty $\sqcap \neg$ AssociateProfessor $\sqcap \neg$ AssistantProfessor
12. UGStudent \equiv Student $\sqcap \forall$ attends.UGCourse
13. PGStudent \equiv Student $\sqcap \exists$ attends.PGCourse
14. MSStudent \sqsubseteq Student $\sqcap \exists$ attends.MSCourse
15. TA \equiv PGStudent $\sqcap \exists$ assists.Course
16. SponsoredStudent \equiv PGStudent $\sqcap \neg$ TA
17. Hostellers \equiv Students $\sqcap \exists$ belongsTo.Hostel
18. DayScholars \equiv Students $\sqcap \neg$ Hostellers
19. ProjectGuide \equiv Faculty $\sqcap \exists$ guides.PGStudent
20. HOD \equiv Faculty $\sqcap =1$ headOf .Department
21. Warden \equiv Staff $\sqcap =1$ headOf.Hostel
22. Publication $\equiv \geq 1$ publishedBy.(Faculty \sqcup Student)
23. Department Event \equiv Event $\sqcap \exists$ orgainedBy.Department
24. ClubEvent \equiv Event $\sqcap \exists$ orgainedBy.Club
25. CulturalCommittee \sqsubseteq Student
26. CulturalEvent \equiv Event $\sqcap \exists$ orgainedBy.CulturalCommittee
27. Department Website = Website $\sqcap \forall$ informationAbout.Department
28. SportsCommittee \sqsubseteq Student
29. SportsEvents \equiv Event $\sqcap \exists$ orgainedBy.SportsCommittee
30. Exam \equiv DepartmentEvent $\sqcap \forall$ conductedBy.Faculty
31. LabAssistant \equiv Person $\sqcap \geq 1$ assists.Laboratory
32. LabAdministrator \equiv Person $\sqcap \geq 1$ administrate.Laboratory
33. LibraryAdministrator \equiv Person $\sqcap \exists$ administrate.Library
34. LibraryStaff \equiv Non-TeachingStaff $\sqcap \exists$ worksIn.Library
35. HostelSec \sqsubseteq Student
36. Hospital Staff \equiv Non-TeachingStaff $\sqcap \exists$ worksIn.Hospital
37. MessStaff \equiv Non-TeachingStaff $\sqcap \exists$ worksIn.Mess
38. GymStaff \equiv Non-TeachingStaff $\sqcap \exists$ worksIn.GymKhana
39. PeopleRegisteredInMess \equiv People $\sqcap \exists$ registeredIn.Mess
40. Chief Security Officer \equiv Staff $\sqcap =1$ headOf.SecurityTeam
41. Threat \equiv Event $\sqcap \exists$ breaches.Security

Motivating Examples (i.e to answer some possible scenarios like listed below):

- List of TA's for a course
- How many students, faculty, etc. are there in the department ?
- No. of publications, research papers by the professors or students.
- All the events organized by a club
- Which Hostel a student belongs to ?