Ali Tashrif Radin HTTP5126 Final Project Proposal 11/17/2024

Planetary Database Proposal

Real World Scenario (2 marks)

Managing data about planetary systems and finding information about the planetary system and its celestial bodies.

Problems & Features (6 marks)

Problem 1: View data about solar systems in the universe

Space is a vast place with many stars with planets and moons. Researchers, instructors and students need to view information about different planetary systems and its layout. The required tables will be star, planet and moon.

Problem 1 - Solution

Using views users can see the layout of different planetary systems. Users will be able to view the names of the star it's, planets of that Planetary system and the moons of each of the planets.

Problem 2: Make Calculations about body in the universe

Since space is so vast and we are constantly finding new stars, planets and moons we also need to find information like its gravitational strength. The required tables will be star, planet and moon.

Problem 2 - Solution

Using functions users can get interesting information about a specific celestial body, like gravitational strength and escape velocity. The database stores values of mass and radius of each body which can be used with Newton's law of universal gravitation to find values like gravitational strength.

Architecture Description (16 marks)

Name of the database: Planetary

Database Tools (3 marks) & Justification (3 marks)

View name(s): view_layout, star_with_planets_view

Having this view can give us a nice summary of a specific planetary system. This includes the name of the star, its planets and the name of the moons of each planet.

Trigger name(s): trg_change_scientific_value_star, trg_change_scientific_value_planet, trg_change_scientific_value_moon

Since I am working with large data, this trigger will change the number to a scientific notation so that it is easier to read for a human.

Function name: fn_gravitaional_calculator
Since the database holds data about mass and radius, this can be used to find the gravitational force. This can be turned into a function for quick calculations.

Database ERD Diagram (7 marks) & Justification (2 marks)

	star			planet			one-to-many	moon		
PK	star_id	INT	one-to-many	PK	planet_id	INT	+	PK	moon_id	INT
U/N	name	VARCHAR	<u></u>	∠FK	star_id	INT]'	FK	planet_id	INT
N	mass_kg	FLOAT	i'	U/N	name	VARCHAR		U/N	name	VARCHAR
FK	star_typ_id	INT		N	mass_kg	FLOAT		N	mass_kg	FLOAT
N	radius_km	FLOAT		N	habitable_zone	CHAR		N	radius_km	FLOAT
	formatted_mass_kg	VARCHAR		FK	planet_type_id	INT		FK	moon_type_id	INT
	formatted_radius_km	VARCHAR		N	radius_kg	FLOAT			formatted_max	VARCHAR
	Ψ			formatted_mass_VARCHAR				formatted_radii VARCHAR		VARCHAR W
				Y	formatted_radiu	VARCHAR				
									one-to-many	
	+			+		one-to-many				+
	star_type				planet_type			moon_type		
PK	star_type_id	INT		PK	planet_type_id	INT		PK	moon_type_id	INT
N	name	VARCHAR		N	name	VARCHAR		N	name	VARCHAR

Justification about table structure: Each star will have a certain amount of planets, and each planet will have a certain amount of moons. Each celestial body will have mass and radius for various calculations. Each celestial body will have unique types giving a basic idea about the celestial body.