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Project 1

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CSC 675: Introduction to Database Systems

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TASK 3

CREATE TABLE

```sql
CREATE TABLE `Catalog` (
  `item_id`   INTEGER,
  `cat_name`   TEXT,
  `cat_description`   TEXT,
  `cat_price`   INTEGER,
  PRIMARY KEY(`item_id`)
);

CREATE TABLE `Character` (
  `cid`   INTEGER,
  `c_name`   TEXT,
  `c_job`   TEXT,
  `c_race`   TEXT,
  PRIMARY KEY(`cid`)
);

CREATE TABLE `Inventory` (
  `cid`   INTEGER,
  `item_id`   INTEGER,
  `quantity`   INTEGER,
  PRIMARY KEY(`cid`,`item_id`),
  FOREIGN KEY(`cid`) REFERENCES `Character`,
  FOREIGN KEY(`item_id`) REFERENCES `Catalog`
);

CREATE TABLE `List_Skill` (
  `skill_id`   INTEGER,
  `s_name`   TEXT,
  `s_description`   TEXT,
  PRIMARY KEY(`skill_id`),
  FOREIGN KEY(`skill_id`) REFERENCES `Skill`
);
```

```
CREATE TABLE `Shop` (
   `shop_id`   INTEGER,
   `shop_name`   TEXT,
   `item_id`   INTEGER,
   PRIMARY KEY(`shop_id`,`item_id`),
   FOREIGN KEY(`item_id`) REFERENCES `Catalog`
);

CREATE TABLE `Skill` (
   `skill_id`   INTEGER,
   `cid`   INTEGER,
   `s_name`   TEXT,
   `s_description`   TEXT,
   PRIMARY KEY(`skill_id`,`cid`),
   FOREIGN KEY(`skill_id`) REFERENCES `List_Skill`,
   FOREIGN KEY(`cid`) REFERENCES `Character`
);

CREATE TABLE `Stat` (
   `cid`   INTEGER,
   `stat_int`   INTEGER,
   `stat_str`   INTEGER,
   `stat_dex`   INTEGER,
   PRIMARY KEY(`cid`),
   FOREIGN KEY(`cid`) REFERENCES `Character`
);
```

TASK 4

Collect data. We created our own data.

Table Character

cid	c_name	c_job	c_race
1	Xena	Warrior	High Elf
2	Robin	Archer	Forest Elf
3	Angel	Mage	Vampire
4	Buffy	Assassin	Human
5	May	Knight	Nord

Table List_Skill

skill_id	s_name	s_description
1	Fireball	Leaves burn
2	Thunderbolt	Leaves opponent paralyzed
3	Lullaby	Put opponent to sleep
4	Pickpocket	Steal an item
5	Confusion	Confused person hits themselves

Table Stat

cid	stat_int	stat_str	stat_dex
1	30	200	80
2	30	80	200
3	240	20	50
4	20	30	240
5	10	210	90

Table Catalog

Item_id	cat_name	cat_description	cat_price
1	CLARITY	restore mana upon use	50
2	FAERIE FIRE	restore 75 health upon use	75
3	ENCHANTED MANGO	restore 150 mana upon use	125
4	TANGO	restore health by eating tree	125
5	HEALING SALVE	restore health upon use	110
6	SMOKE OF DECEIT	invisibility for self and ally for 35 sec	50
7	TOWN PORTAL SCROLL	teleport to a friendly building	50
8	DUST OF APPEARANCE	reveal and slow invisible units nearby upon use	180
9	BOTTLE	restore health and mana upon use	660
10	GAUNTLETS OF STRENGTH	increase strength by 3	150
11	SLIPPER OF AGILITY	increase agility by 3	150
12	MANTLE OF INTELLIGENCE	increase intelligence by 3	150
13	CIRCLET	increase strength, agility and intel by 2	165
14	BELT OF STRENGTH	increase strength by 6	450
15	BAND OF ELVEN SKIN	increase agility by 6	450
16	ROBE OF THE MAGI	increase intel by 6	450
17	ORGE CLUB	increase strength by 10	1000
18	BLADE OF ALACRITY	increase agility by 10	1000
19	STAFF OF WIZARDY	increase intel by 10	1000
20	RING OF PROTECTION	increase armor by 2	175
21	CHAINMAIL	increase armor by 5	550
22	BROAD SWORD	increase damage by 18	1200
23	CLAYMORE	increase damage by 21	1400
24	MITHRIL HAMMER	increase damage by 24	1600
25	CRYSTALAYS	increase damage by 30	2120
26	WIND LACE	increase movement speed by 20	235
27	SHIVA'S GUARD	increase intel by 30 and armor by 15	4700
28	BLADE MAIL	increase intel by 10, damage by 22 and armor by 6	2200
29	HEART OF TARRASQUE	increase strength by 45 and health by 250	5500
30	AGHANIM'S SCEPTOR	increase strength, agility and intel by 10 and health by 175	4200

Table Skill

skill_id	cid	s_name	s_description
1	1	Fireball	Leaves burn
2	1	Thunderbolt	Leaves opponent paralyzed
3	1	Lullaby	Put opponent to sleep
4	1	Pickpocket	Steal an item
5	1	Confusion	Confused person hits themselves
1	2	Fireball	Leaves burn
2	2	Thunderbolt	Leaves opponent paralyzed
3	2	Lullaby	Put opponent to sleep
4	2	Pickpocket	Steal an item
5	2	Confusion	Confused person hits themselves
1	3	Fireball	Leaves burn
2	3	Thunderbolt	Leaves opponent paralyzed
3	3	Lullaby	Put opponent to sleep
4	3	Pickpocket	Steal an item
5	3	Confusion	Confused person hits themselves
1	4	Fireball	Leaves burn
2	4	Thunderbolt	Leaves opponent paralyzed
3	4	Lullaby	Put opponent to sleep
4	4	Pickpocket	Steal an item
5	4	Confusion	Confused person hits themselves
1	5	Fireball	Leaves burn
2	5	Thunderbolt	Leaves opponent paralyzed
3	5	Lullaby	Put opponent to sleep
4	5	Pickpocket	Steal an item
5	5	Confusion	Confused person hits themselves

Table Inventory

cid	item_id	quantity
1	1	3
1	4	2
1	10	3
1	11	1
1	22	1
1	28	1
2	2	2
2	3	2
2	11	3
2	15	4
2	18	1
2	30	1
3	7	4
3	9	1
3	12	4
3	16	2
3	19	1
3	28	1
4	9	1
4	8	3
4	20	5
4	21	5
4	22	4
4	27	1
5	4	3
5	3	3
5	24	4
5	25	4
5	22	2
5	28	1

Table Shop

shop_id	shop_name	item_id
1	POTION LOCAL	1
1	POTION LOCAL	2
1	POTION LOCAL	3
1	POTION LOCAL	4
1	POTION LOCAL	5
1	POTION LOCAL	6
1	POTION LOCAL	7
1	POTION LOCAL	8
1	POTION LOCAL	9
2	WARRIOR NEEDS	4
2	WARRIOR NEEDS	7
2	WARRIOR NEEDS	9
2	WARRIOR NEEDS	10
2	WARRIOR NEEDS	11
2	WARRIOR NEEDS	12
2	WARRIOR NEEDS	13
2	WARRIOR NEEDS	14
2	WARRIOR NEEDS	15
2	WARRIOR NEEDS	16
2	WARRIOR NEEDS	17
2	WARRIOR NEEDS	18
2	WARRIOR NEEDS	19
2	WARRIOR NEEDS	20
2	WARRIOR NEEDS	21
3	UNDEAD FOREST	4
3	UNDEAD FOREST	7
3	UNDEAD FOREST	9
3	UNDEAD FOREST	17
3	UNDEAD FOREST	18

3	UNDEAD FOREST	19
3	UNDEAD FOREST	22
3	UNDEAD FOREST	23
3	UNDEAD FOREST	24
3	UNDEAD FOREST	25
4	MOUNTAIN OF ELF	4
4	MOUNTAIN OF ELF	7
4	MOUNTAIN OF ELF	9
4	MOUNTAIN OF ELF	14
4	MOUNTAIN OF ELF	15
4	MOUNTAIN OF ELF	16
4	MOUNTAIN OF ELF	26
4	MOUNTAIN OF ELF	27
4	MOUNTAIN OF ELF	28
4	MOUNTAIN OF ELF	29
4	MOUNTAIN OF ELF	30

TASK 5

Query 1: Find the prices that are most used in the catalog

TEST

SELECT C.cat_price
FROM Catalog C
Where C.cat_price >= 50
GROUP BY C.cat_price
HAVING COUNT (*) > 1;

OUTPUT

	cat_price
1	50
2	125
3	150
4	450
5	1000

Query 2: Find the item that more than 3 Heroes use.

<u>TEST</u>

SELECT C.cat_name , I.quantity
FROM Inventory I, Catalog C
WHERE C.item_id = I.item_id
GROUP BY I.item_id
HAVING COUNT(I.item_id) >= 3

<u>OUTPUT</u>

	cat_name	quantity
1	BROAD SWORD	2
2	BLADE MAIL	1

Query 3: Find the heros with more than 15 items in the inventory.

TEST

SELECT C.c_name,SUM (I.quantity) AS num_of_items
FROM Inventory I, Character C
WHERE I.cid= C.cid
GROUP BY C.c_name
HAVING SUM (I.quantity)>15

OUTPUT

c_name	num_of_items
Buffy	19
May	17

TASK 6

INDEX

Task: create a index order by price in the Catalog.

CREATE INDEX ItemByPrice ON Catalog (cat_price)

TEST

SELECT *
FROM Catalog INDEXED BY ItemByPrice
WHERE cat_price < 150;

OUTPUT:

item_id	cat_name	cat_description	cat_price
1	1	CLARITY	restore mana upon use	50
2	6	SMOKE OF DECEIT	invisibility for self and ally for 35 sec	50
3	7	TOWN PORTAL SCROLL	teleport to a friendly building	50
4	2	FAERIE FIRE	restore 75 health upon use	75
5	5	HEALING SALVE	restore health upon use	110
6	3	ENCHANTED MANGO	restore 150 mana upon use	125
7	4	TANGO	restore health by eating tree	125

VIEW

Task: Create a view of player with all the basic information of the character.

CREATE VIEW CurrentPlayer(name, job, race, intelligence, strengh, dexterity)
as SELECT C.c_name, C.c_job, C.c_race, S.stat_int, S.stat_str, S.stat_dex
FROM Character C, Stat S
WHERE C.cid = S.cid

TEST

SELECT * FROM CurrentPlayer;

OUTPUT:

	name	job	race	intelligence	strengh	dexterity
1	Xena	Warrior	High Elf	30	200	80
2	Robin	Archer	Forest Elf	30	80	200
3	Angel	Mage	Vampire	240	20	50
4	Buffy	Assassin	Human	20	30	240
5	May	Knight	Nord	10	210	90

INSERT

Task: Inserting a new character.

TEST

INSERT INTO Character (c_name,c_job,c_race)
VALUES ('Dragon Knight','Knight','Human')

OUTPUT

Before   After

cid	c_name	c_job	c_race
1	Xena	Warrior	High Elf
2	Robin	Archer	Forest Elf
3	Angel	Mage	Vampire
4	Buffy	Assassin	Human
5	May	Knight	Nord

cid	c_name	c_job	c_race
1	Xena	Warrior	High Elf
2	Robin	Archer	Forest Elf
3	Angel	Mage	Vampire
4	Buffy	Assassin	Human
5	May	Knight	Nord
6	Dragon Knight	Knight	Human

DELETE

Task: Deleting a character.

<u>TEST</u>

DELETE FROM Character
WHERE c_name= 'Dragon Knight'

<u>OUTPUT</u>

Before:

cid	c_name	c_job	c_race
1	Xena	Warrior	High Elf
2	Robin	Archer	Forest Elf
3	Angel	Mage	Vampire
4	Buffy	Assassin	Human
5	May	Knight	Nord
6	Dragon Knight	Knight	Human

After:

cid	c_name	c_job	c_race
1	Xena	Warrior	High Elf
2	Robin	Archer	Forest Elf
3	Angel	Mage	Vampire
4	Buffy	Assassin	Human
5	May	Knight	Nord

UPDATE

Task 1: Updating a character. In this example, we update May's job (c_job) to Ninja

<u>TEST 1</u>

UPDATE Character
SET c_job = 'Ninja'
WHERE c_job = 'Knight'

<u>OUTPUT</u>

Before: After:

	cid	c_name	c_job	c_race
	Filter	Filter	Filter	Filter
1	5	May	Knight	Nord
2	4	Buffy	Assassin	Human
3	3	Angel	Mage	Vampire
4	2	Robin	Archer	Forest Elf
5	1	Xena	Warrior	High Elf

	cid	c_name	c_job	c_race
	Filter	Filter	Filter	Filter
1	5	May	Ninja	Nord
2	4	Buffy	Assassin	Human
3	3	Angel	Mage	Vampire
4	2	Robin	Archer	Forest Elf
5	1	Xena	Warrior	High Elf

Task 2: Update an item in the inventory. In this example, May just picked up another item. Update that item in the inventory May's (cid = 5) item (item_id = 28)

TEST 2

UPDATE Inventory
SET quantity = 2
WHERE cid = 5 and item_id = 28

OUTPUT

Before:

	cid	item_id	quantity
	Filter	Filter	Filter
1	5	28	1
2	5	22	2
3	5	25	4
4	5	24	4
5	5	3	3
6	5	4	3
7	4	27	1
8	4	22	4
9	4	21	5
10	4	20	5
11	4	8	3
12	4	9	1
13	3	28	1
14	3	19	1

After:

	cid	item_id	quantity
	Filter	Filter	Filter
1	5	28	2
2	5	22	2
3	5	25	4
4	5	24	4
5	5	3	3
6	5	4	3
7	4	27	1
8	4	22	4
9	4	21	5
10	4	20	5
11	4	8	3
12	4	9	1
13	3	28	1
14	3	19	1

SELECT

Task 1: Find all the items price that are higher than $1000 on the Catalog.

TEST 1

SELECT *
FROM Catalog INDEXED BY ItemByPrice
WHERE cat_price > 1000;

OUTPUT

	item_id	cat_name	cat_description	cat_price
1	22	BROAD SWORD	increase damage by 18	1200
2	23	CLAYMORE	increase damage by 21	1400
3	24	MITHRIL HAMMER	increase damage by 24	1600
4	25	CRYSTALAYS	increase damage by 30	2120
5	28	BLADE MAIL	increase intel by 10, damage by 22 and armor by 6	2200
6	30	AGHANIM'S SCEPTOR	increase strength, agility and intel by 10 and health by 175	4200
7	27	SHIVA'S GUARD	increase intel by 30 and armor by 15	4700
8	29	HEART OF TARRASQUE	increase strength by 45 and health by 250	5500

Task 2: Find all character who has 150 strength or higher.

TEST 2

SELECT *
FROM Character C, Stat S
WHERE C.cid = S.cid AND S.stat_str >= 150;

OUTPUT

	cid	c_name	c_job	c_race	cid	stat_int	stat_str	stat_dex
1	1	Xena	Warrior	High Elf	1	30	200	80
2	5	May	Knight	Nord	5	10	210	90