

IS664 Spring 2024

Database Programming Midterm Exam

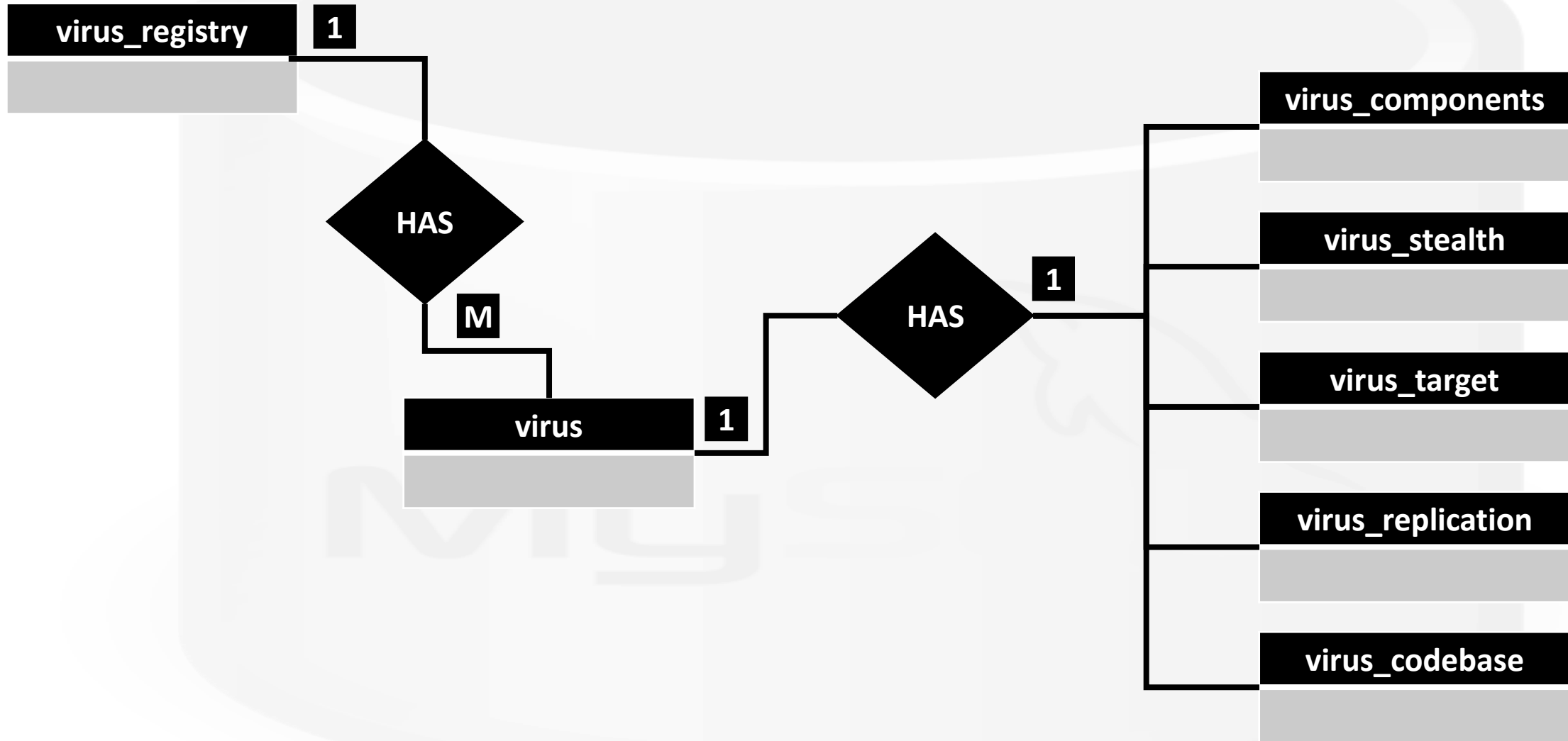
Fundamental Database Concepts

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General

- Task 1: Create a single .sql script that creates the **viralgrey** database based on the schema shown on the following slides.
- Task 2: Use the provide **viralgreyPOP.sql** file to populate the **viralgrey** database.
- Task 3: Create a single .sql script that contains all the code required to complete Queries 1-4.
- Task 4: Complete the problem you have on your Exam sheet. Include this code in the script that contains your queries.
- *** **All Primary and Foreign Key Constraints must be named**
- *** **All Queries must utilize equijoins**

viralgrey Schema



viralgrey Schema

```
MySQL 8.0 Command Line Cli x + v
mysql> describe virus_registry;
+-----+-----+-----+-----+-----+
| Field      | Type                | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| VirusName  | varchar(50)         | YES  |     | NULL    |      |
| VirusSeqID | varchar(50)         | NO   | PRI | NULL    |      |
| DetectedAt | enum('NYC', 'PV', 'WP') | YES  |     | NULL    |      |
+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

```
MySQL 8.0 Command Line Cli x + v
mysql> describe virus;
+-----+-----+-----+-----+-----+
| Field      | Type                | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+
| VirusSeqID | varchar(50)         | NO   | PRI | NULL    |      |
| Discovery  | date               | YES  |     | NULL    |      |
| Creator    | enum('State_Actor', 'Individual', 'Unknown') | YES  |     | NULL    |      |
+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

viralgrey Schema

```
MySQL 8.0 Command Line Cli x + v - □ x
mysql> describe virus_components;
+-----+-----+-----+-----+-----+-----+
| Field      | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| VirusSeqID | varchar(50)   | NO   | PRI | NULL    |       |
| Payload    | varchar(50)   | YES  |     | NULL    |       |
| VTrigger   | varchar(50)   | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

```
MySQL 8.0 Command Line Cli x + v - □ x
mysql> describe virus_stealth;
+-----+-----+-----+-----+-----+-----+
| Field      | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| VirusSeqID | varchar(50)   | NO   | PRI | NULL    |       |
| Encryption | enum('YES','NO') | YES  |     | NULL    |       |
| Obfuscation | enum('YES','NO') | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

```
MySQL 8.0 Command Line Cli x + v - □ x
mysql> describe virus_codebase;
+-----+-----+-----+-----+-----+-----+
| Field      | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| VirusSeqID | varchar(50)   | NO   | PRI | NULL    |       |
| PreScript  | varchar(100)  | YES  |     | NULL    |       |
| MainScript | varchar(100)  | YES  |     | NULL    |       |
| PostScript | varchar(100)  | YES  |     | NULL    |       |
| Script     | text          | YES  |     | NULL    | STORED GENERATED |
+-----+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

viralgrey Schema

```
MySQL 8.0 Command Line Cli x + v - □ x
mysql> describe virus_target;
+-----+-----+-----+-----+-----+-----+
| Field      | Type                                | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| VirusSeqID | varchar(50)                         | NO   | PRI | NULL    |       |
| TargetOS   | enum('Windows','Linux','PLC')       | YES  |     | NULL    |       |
| EmbeddedIn | enum('File','Macro','Boot_Sector') | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

```
MySQL 8.0 Command Line Cli x + v - □ x
mysql> describe virus_replication;
+-----+-----+-----+-----+-----+-----+
| Field          | Type                                | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| VirusSeqID     | varchar(50)                         | NO   | PRI | NULL    |       |
| Replication     | varchar(50)                         | YES  |     | NULL    |       |
| PopulatonGrowth | enum('HIGH','LOW')                  | YES  |     | NULL    |       |
| IsDropper       | enum('YES','NO')                    | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

Problem 1

What are the number of days/months/years since Jan 1, 2024, for all viruses detected at NYC Campus that were detected after August 1, 2022. (*Assume all months have 30 days*)

Display Results in Format Shown

VirusName	VirusSeqID	DetectedAt	Discovered On	Days Elapsed	Months Elapsed	Years Elapsed
Mind_b0y	12a1x12	NYC	2023-10-28	65	2.17	0.18
Bill_d2y	32x6y32	NYC	2023-03-11	296	9.87	0.81
Gold_b1g	3a4d3	NYC	2022-10-13	445	14.83	1.22
Fact_g9z	42x1z42	NYC	2022-11-15	412	13.73	1.13
Fire_h1x	44f0h44	NYC	2022-10-11	447	14.90	1.22
Form_a8e	52z0z52	NYC	2023-02-20	315	10.50	0.86
Door_b2c	59c7e59	NYC	2023-12-14	18	0.60	0.05
Club_e5z	5d6h5	NYC	2022-10-14	444	14.80	1.22
Baby_f1b	68g4a68	NYC	2023-11-11	51	1.70	0.14
Lord_d9a	6f1x6	NYC	2023-10-28	65	2.17	0.18
Edge_f1y	70f5z70	NYC	2022-10-20	438	14.60	1.20
Fish_g0a	76e2c76	NYC	2023-01-16	350	11.67	0.96
Back_g7a	78h3h78	NYC	2023-01-28	338	11.27	0.93
Case_y8g	93h8c93	NYC	2022-12-15	382	12.73	1.05
Farm_z9a	9a6b9	NYC	2023-03-22	285	9.50	0.78

Problem 2

List the virus detections at the Pleasantville campus that were within 60 days before or after Christmas (Dec 25) 2022

MySQL 8.0 Command Line Cli

Display Results in Format Shown

VirusName	VirusSeqID	DetectedAt	Discovered On	Days Before/After Christmas
Case_h4y	89z0a89	PV	2022-11-14	41
Deal_z9c	98z2f98	PV	2023-01-20	26

Problem 3

List all viruses whose PreScript code starts with an:

'e' and ends with a 'b'

'f' and ends with a 'y'

'f' and ends with a 'f'

Display Results in Format Shown

```
MySQL 8.0 Command Line Cli  X  +  v
+-----+-----+-----+
| VirusName | VirusSeqID | PreScript |
+-----+-----+-----+
| Cost_a3h  | 13a4a13    | e0y x5y z5b |
| Look_c0h  | 37g4b37    | f1g e2d c3y |
| Ball_d2f  | 61y9a61    | f0x a8d x5f |
+-----+-----+-----+
```

Problem 4

List all viruses whose PreScript, MainScript, or PostScript contains a 3-digit alpha numeric sequence that starts with 'e5'

Display Results in Format Shown

MySQL 8.0 Command Line Cli

+

▼

Display Results in Format Sh

Virus Registry		PreScript	MainScript	PostScript
{ "ID:": "13a4a13", "Name:": "Cost_a3h", "Location Found:": "PV" }	e0y x5y z5b	e5y a2c z8e a5c y3h	e2a x6d	
{ "ID:": "16c5z16", "Name:": "Home_b8d", "Location Found:": "WP" }	d1a e3d d1c	h3e a4h f8z e1h x4f	e5g x1z	
{ "ID:": "81h1h81", "Name:": "Face_d1h", "Location Found:": "WP" }	e5z e5b h0g	e5e f2g a3a y8b c0f	c7d g5x	