

IS-664 Database Programming

Fall 2022

Advanced SQL

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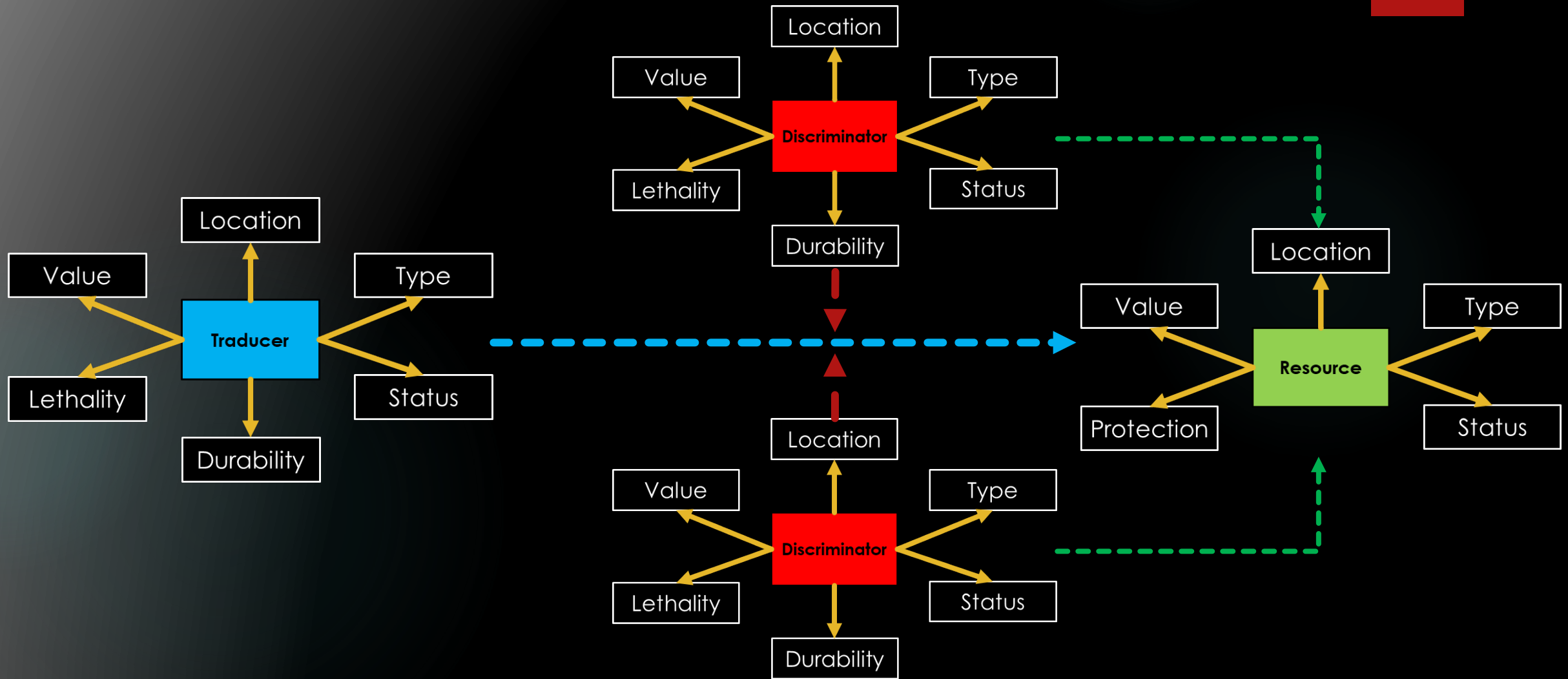
Data Modelling Exercise 3

USE OF JUPYTER LAB WITH MYSQL

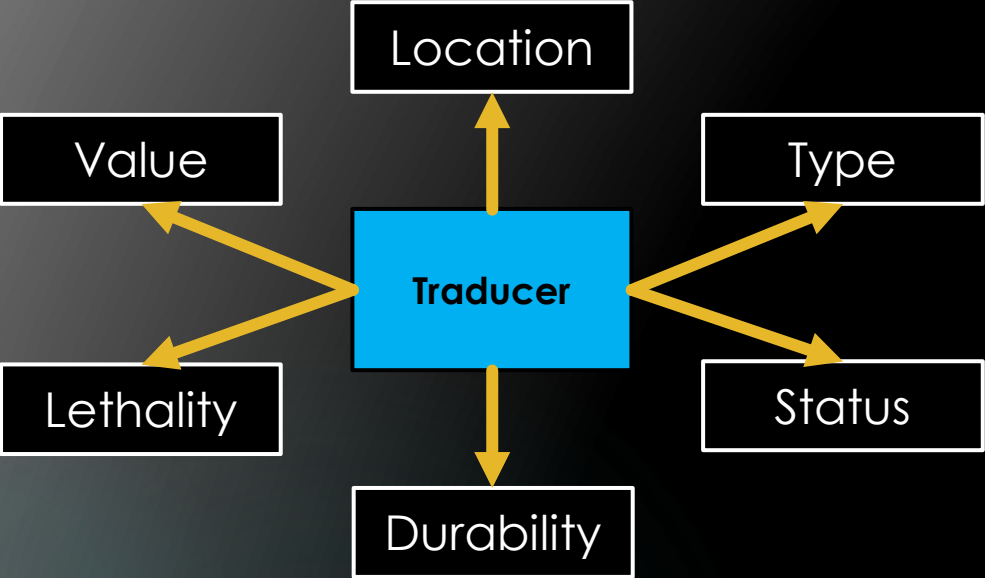
Professor HG Locklear

Aggressor System

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Traducer Agent



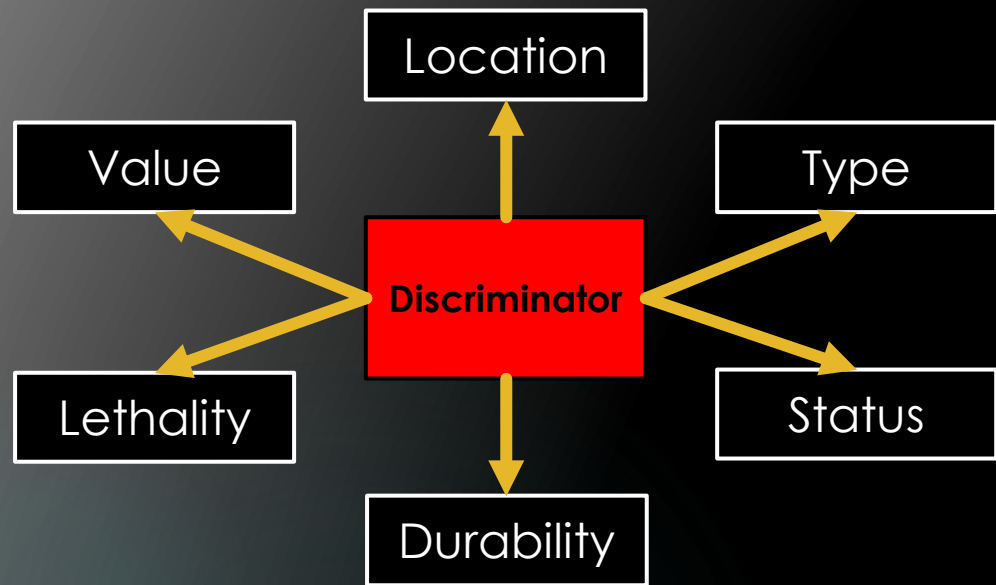
```
mysql> describe traducer;
+-----+-----+-----+-----+-----+-----+
| Field | Type                               | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| TID   | varchar(20)                        | NO   | PRI | NULL    |       |
| TType | enum('Medium','Heavy')             | YES  |     | NULL    |       |
| TLoc_X | int                                | YES  |     | NULL    |       |
| TLoc_Y | int                                | YES  |     | NULL    |       |
| TValue | int                                 | YES  |     | NULL    |       |
| TLethal | int                                | YES  |     | NULL    |       |
| TStatus | enum('Available','Not Available') | YES  |     | NULL    |       |
| TDurable | decimal(10,2)                      | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
```

State	Value Range
Type	'Medium' or 'Heavy'
Location	X [0-200] Y [0-200]
Value	Medium = 10 Heavy = 25
Lethality	Medium = 100 Heavy = 300
Status	'Available' or 'Not Available'
Durability	[5-10%] of Lethality

Values in brackets are random-generated permissible range

TID PATTERN = 'TA-'[1-5]'-'[1-100]

Discriminator Agent



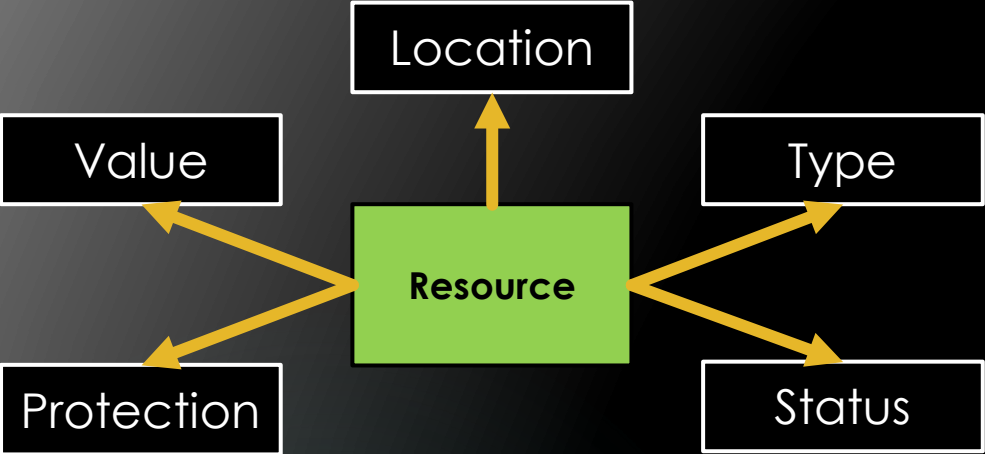
State	Value Range
Type	'Standard' or 'Multi-Role'
Location	X [400-900] Y [4-900]
Value	Standard = 4 Multi-Role = 7
Lethality	Standard = 10 Multi-Role = 12
Status	'Available' or 'Not Available'
Durability	[5-10%] of Lethality

Values in brackets are random-generated permissible range

```
MySQL 8.0 Command Line Cli
mysql> describe discriminator;
+-----+-----+-----+-----+-----+-----+
| Field | Type                               | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| DID   | varchar(20)                        | NO   | PRI | NULL    |       |
| DType | enum('Standard','Multi-Role')      | YES  |     | NULL    |       |
| DLoc_X | int                                | YES  |     | NULL    |       |
| DLoc_Y | int                                | YES  |     | NULL    |       |
| DValue | int                                | YES  |     | NULL    |       |
| DLethal | int                                | YES  |     | NULL    |       |
| DStatus | enum('Available','Not Available') | YES  |     | NULL    |       |
| DDurable | decimal(10,2)                     | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
```

DID PATTERN = 'TA-'[1-5]'-'[1-100]

Resource



```
mysql> describe resource;
+-----+-----+-----+-----+-----+-----+
| Field | Type                               | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| RID   | varchar(20)                        | NO   | PRI | NULL    |       |
| RType | enum('TAC','OP','STRAT')           | YES  |     | NULL    |       |
| RLoc_X | int                                | YES  |     | NULL    |       |
| RLoc_Y | int                                | YES  |     | NULL    |       |
| RValue | int                                | YES  |     | NULL    |       |
| RStatus | enum('Active','Dormant')           | YES  |     | NULL    |       |
| RProtect | decimal(10,2)                     | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
```

State	Value Range
Type	'TAC' or 'OP' or 'STRAT'
Location	X [700-950] Y [700-950]
Value	TAC = [10-150] OP = [75-300] STRAT = [250-500]
Status	'Active' or 'Dormant'
Protection	TAC = Active [100-300] Dormant [50-150] OP = Active [750-1000] Dormant [50-150] STRAT = Active [2500-3000] Dormant [50-150]

Values in brackets are random-generated permissible range

RID PATTERN = 'R-'[1-5]#[1-100]

Task 1: Entity Generation

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Create the function **traducerAgent** that accepts no parameters and returns an SQL-formatted string that represents a traducer based on the information on [slide 3](#).

```
+-----+
| MSG                                         |
+-----+
| INSERT INTO traducer VALUES('TA-5-26','Heavy',82,30,25,300,'Not Available',24.00) |
+-----+
```

Create the function **descriminatorAgent** that accepts no parameters and returns an SQL-formatted string that represents a discriminator based on the information on [slide 4](#).

```
+-----+
| MSG                                         |
+-----+
| INSERT INTO discriminator VALUES('DA-2-36','Standard',77,14,4,10,'Available',0.60) |
+-----+
```

Create the function **resourceBuilder** that accepts no parameters and returns an SQL-formatted string that represents a resource based on the information on [slide 5](#).

```
+-----+
| MSG                                         |
+-----+
| INSERT INTO resource VALUES('R-1#100','OP',868,793,242,'Active',202) |
+-----+
```

Task 2: Database Generation

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Create the stored procedure **buildAggressor** that builds the database **aggressor_system** as shown below.

traducer							
<u>TID</u>	TType	TLoc_X	TLoc_Y	TValue	TLethal	TStatus	TDurable

discriminator							
<u>DID</u>	DType	DLoc_X	DLoc_Y	DValue	DLethal	DStatus	DDurable

resource						
<u>RID</u>	RType	RLoc_X	RLoc_Y	RValue	RStatus	RProtect

Task 3: Database Population

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Create the stored procedure **aggressorPopulator** that accepts the number of traducer records, discriminator records, and resource records and populates the database **aggressor_system** with the specified number, which have been generated using the functions defined in **slide 6**.

```
MySQL 8.0 Command Line Cli x + v
+-----+-----+-----+-----+-----+-----+-----+
| TID    | TType | TLoc_X | TLoc_Y | TValue | TLethal | TStatus      | TDurable |
+-----+-----+-----+-----+-----+-----+-----+
| TA-2-88 | Medium | 19 | 88 | 10 | 100 | Not Available | 7.00 |
| TA-3-26 | Medium | 163 | 183 | 10 | 100 | Available | 9.00 |
| TA-3-65 | Heavy | 29 | 55 | 25 | 300 | Not Available | 27.00 |
+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> SELECT * FROM DISCRIMINATOR;
+-----+-----+-----+-----+-----+-----+-----+
| DID    | DType | DLoc_X | DLoc_Y | DValue | DLethal | DStatus      | DDurable |
+-----+-----+-----+-----+-----+-----+-----+
| DA-2-14 | Multi-Role | 151 | 56 | 7 | 12 | Not Available | 1.08 |
| DA-3-92 | Multi-Role | 150 | 88 | 7 | 12 | Not Available | 0.72 |
| DA-5-91 | Standard | 109 | 29 | 4 | 10 | Not Available | 0.90 |
+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> SELECT * FROM RESOURCE;
+-----+-----+-----+-----+-----+-----+-----+
| RID    | RType | RLoc_X | RLoc_Y | RValue | RStatus | RProtect |
+-----+-----+-----+-----+-----+-----+-----+
| R-1#19 | OP | 927 | 947 | 205 | Dormant | 78.00 |
| R-3#55 | OP | 936 | 721 | 95 | Dormant | 131.00 |
| R-4#52 | TAC | 721 | 914 | 21 | Active | 145.00 |
+-----+-----+-----+-----+-----+-----+-----+
```


Task 4: Data Analysis

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- *Modify your `build_aggressor` to remove the primary keys from the `aggressor_system` database.
- *Build 100 traducers 100 discriminators 25 resource records.

Create the stored procedure `TD_analysis` that accepts no parameters and produces the analysis of the traducer and discriminator records in the format shown below.

```
MySQL 8.0 Command Line Cli X + v

-----
| TRADUCER ANALYSIS
  Available: 35 Not Available: 65
  Total Mediums: 37 Total Heavies: 63
  Total Available Mediums: 11 Total Available Heavies: 24
  Total Not Available Mediums: 26 Total Not Available Heavies: 39
  Total Value Available: 710 Total Value Not Available: 710
  Total Value Available Mediums: 110 Total Value Available Heavies: 600
  Availability Percentage: 0.3500
DISCRIMINATOR ANALYSIS
  Available: 36 Not Available: 64
  Total Standards: 33 Total Multi-Roles: 67
  Total Available Standards: 11 Total Available Multi-Roles: 25
  Total Not Available Standards: 22 Total Not Available Multi-Roles: 42
  Total Value Available: 219 Total Value Not Available: 219
  Total Value Available Standards: 44 Total Value Available Multi-Roles: 175
  Availability Percentage: 0.3600 |
+-----
```