Elicia Pluymers

NN: 47

Memo 4 Final Report

**Functional Dependency Chart and Derived FDs**

**Final Universal Relation Table Memo 3**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| # | Species | Region ID | Study Name | StudyID | Size | ClassID | Ave  PHT | PHT Value | Animal Number | Location | Sample Date | Sample Number | Sex | Status | PartID | Name (Dog) | Initial Contact | Final Contact | Number Of Samples |
| 1 | A | BZ | Cerrado | Cer-812 | 70 | G | 10 | 9.1 | 31 | N1W1 | Aug 2022 | 16 | M | 1 | P1201 | Cindy | 6/20/2022 | NULL | 4 |
| 2 | E | AF | Zambia | Za1-113 | 50 | N | 110 | 119 | 78 | S4E3 | Dec 2021 | 21 | F | 1 | P1013 | Max | 3/20/2021 | NULL | 4 |
| 3 | C | AC | Tar Sands-1 | TS1-912 | 20 | P | 60 | 60 | 48 | N2W1 | Oct 2021 | 43 | M | 0 | P1024 | Casey | 4/15/2021 | NULL | 1 |
| 4 | W | AC | Tar Sands-1 | TS1-912 | 20 | P | 30 | 34 | 102 | N1W2 | Nov 2022 | 44 | F | 1 | P1203 | Sampson | 9/1/2022 | NULL | 2 |
| 5 | C | AC | Tar Sands-1 | TS1-912 | 20 | P | 60 | 55 | 48 | N2E4 | Oct 2022 | 46 | M | 1 | P1023 | Sunny | 7/12/2022 | NULL | 3 |
| 6 | C | AC | Tar Sands-2 | TS2-313 | 20 | G | 60 | 50 | 48 | N2W3 | Oct 2022 | 47 | F | 1 | P1023 | Sunny | 7/12/2022 | NULL | 3 |
| 7 | C | AC | Tar Sands-2 | TS2-313 | 20 | G | 60 | 55.5 | 39 | N1W1 | Aug 2021 | 55 | ? | 1 | P1013 | Max | 3/20/2021 | NULL | 4 |
| 8 | A | BZ | Cerrado | Cer-812 | 70 | G | 10 | 16 | 107 | N1E5 | Jul 2022 | 58 | F | 1 | P1202 | Mason | 6/1/2022 | 10/1/2022 | 2 |
| 9 | D | AC | Tar Sands-2 | TS2-313 | 20 | G | 8.5 | 7 | 101 | N1W1 | Aug 2022 | 78 | M | 1 | P1023 | Sunny | 7/12/2022 | NULL | 3 |
| 10 | D | AC | Tar Sands-1 | TS1-912 | 20 | P | 8.5 | 9.2 | 55 | S2E2 | Dec 2021 | 81 | M | 1 | P1012 | Bailey | 1/11/2021 | NULL | 1 |
| 11 | P | BZ | Cerrado | Cer-812 | 70 | G | 30 | 35 | 55 | S2E2 | Aug 2022 | 99 | F | 1 | P1201 | Cindy | 6/20/2022 | NULL | 4 |
| 12 | E | AF | Zambia | Za1-113 | 50 | N | 110 | 116 | 55 | N1W1 | Aug 2022 | 67 | M | 1 | P1013 | Max | 3/20/2021 | NULL | 4 |
| 13 | A | BZ | Cerrado | Cer-812 | 70 | G | 10 | 9.2 | 31 | N1W1 | Sep 2022 | 26 | M | 1 | P1201 | Cindy | 6/20/2022 | NULL | 4 |
| 14 | W | BZ | Cerrado | Cer-812 | 70 | G | 30 | 30 | 102 | N2E3 | Aug 2022 | 10 | F | 0 | P1202 | Mason | 6/1/2022 | 10/1/2022 | 2 |
| 15 | W | AC | Tar Sands-1 | TS1-912 | 20 | P | 30 | 32 | 102 | N1W3 | Dec 2022 | 16 | F | 1 | P1203 | Sampson | 9/1/2022 | NULL | 2 |
| 16 | P | BZ | Cerrado | Cer-812 | 70 | G | 30 | 34 | 55 | N1E5 | Sep 2022 | 82 | F | 1 | P1201 | Cindy | 6/20/2022 | NULL | 4 |
| 17 | E | AF | Zambia | Za1-113 | 50 | N | 110 | 115 | 52 | N1W1 | Aug 2022 | 44 | M | 0 | P1013 | Max | 3/20/2021 | NULL | 4 |

**Functional Dependency Chart**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Species | Region ID | Study Name | StudyID | Size | ClassID | AvePHT | PHT Value | Animal Number | Location | Sample Date | Sample Number | Sex | Status | PartID | Name (Dog) | Initial Contact | Final Contact | Number Of Samples |
| Species |  | 4 & 14 | 4 & 14 | 4 & 14 | 4 & 14 | 4 & 14 |  | 1 & 8 | 1 & 8 | 1 & 8 | 1 & 8 | 1 & 8 | 1 & 8 | 3 & 5 | 1 & 8 | 1 & 8 | 1 & 8 | 1 & 8 | 1 & 8 |
| Region ID | 3 & 4 |  | 5 & 6 | 5 & 6 |  | 5 & 6 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 13 & 14 | 3 & 4 |
| Study Name | 3 & 4 |  |  |  |  |  | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 1 & 8 | 3 & 4 |
| StudyID | 3 & 4 |  |  |  |  |  | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 1 & 8 | 3 & 4 |
| Size | 3 & 4 |  | 5 & 6 | 5 & 6 |  | 5 & 6 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 3 & 4 | 1 & 8 | 3 & 4 |
| ClassID | 1 & 6 | 1 & 6 | 1 & 6 | 1 & 6 | 1 & 6 |  | 1 & 6 | 1 & 6 | 1 & 6 | 1 & 6 | 1 & 6 | 1 & 6 | 1 & 6 | 3 & 4 | 1 & 6 | 1 & 6 | 1 & 6 | 1 & 8 | 1 & 6 |
| AvePHT | 15 & 16 | 4 & 14 | 5 & 6 | 5 & 6 | 4 & 14 | 5 & 6 |  | 5 & 6 | 6 & 7 | 5 & 6 | 3 & 5 | 5 & 6 | 5 & 6 | 3 & 5 | 1 & 8 | 1 & 8 | 1 & 8 | 1 & 8 | 1 & 8 |
| PHT Value | 10 & 13 | 10 & 13 | 10 & 13 | 10 & 13 | 10 & 13 | 10 & 13 | 10 & 13 |  | 10 & 13 | 10 & 13 | 10 & 13 | 10 & 13 |  |  | 10 & 13 | 10 & 13 | 10 & 13 |  | 10 & 13 |
| Animal Number | 10 & 12 | 10 & 12 | 10 & 12 | 10 & 12 | 10 & 12 | 10 & 12 | 10 & 12 | 10 & 12 |  | 10 & 12 | 10 & 12 | 10 & 12 | 10 & 11 | 3 & 5 | 10 & 12 | 10 & 12 | 10 & 12 | 15 & 16 | 10 & 12 |
| Location | 1 & 7 | 1 & 7 | 1 & 7 | 1 & 7 | 1 & 7 | 1 & 17 | 1 & 7 | 1 & 7 | 1 & 7 |  | 1 & 7 | 1 & 7 | 1 & 7 | 1 & 17 | 1 & 7 | 1 & 7 | 1 & 7 |  | 1 & 9 |
| Sample Date | 1 & 9 | 1 & 9 | 1 & 9 | 1 & 9 | 1 & 9 | 1 & 12 | 1 & 9 | 1 & 9 | 1 & 9 | 1 & 11 |  | 1 & 9 | 1 & 11 | 1 & 14 | 1 & 9 | 1 & 9 | 1 & 9 | 1 & 14 | 1 & 9 |
| Sample Number | 4 & 17 | 4 & 17 | 4 & 17 | 4 & 17 | 4 & 17 | 4 & 17 | 4 & 17 | 4 & 17 | 4 & 17 | 4 & 17 | 4 & 17 |  | 4 & 17 | 4 & 17 | 4 & 17 | 4 & 17 | 4 & 17 |  | 4 & 17 |
| Sex | 1 & 3 | 1 & 3 | 1 & 3 | 1 & 3 | 1 & 3 | 1 & 3 | 1 & 3 | 1 & 3 | 1 & 3 | 1 & 3 | 1 & 3 | 1 & 3 |  | 1 & 3 | 1 & 3 | 1 & 3 | 1 & 3 | 14 & 15 | 1 & 3 |
| Status | 1 & 2 | 1 & 2 | 1 & 2 | 1 & 2 | 1 & 2 | 1 & 2 | 1 & 2 | 1 & 2 | 1 & 2 | 1 & 2 | 1 & 2 | 1 & 2 | 1 & 2 |  | 1 & 2 | 1 & 2 | 1 & 2 | 1 & 8 | 1 & 8 |
| PartID | 8 & 14 | 2 & 7 | 5 & 6 | 5 & 6 | 2 & 7 | 5 & 6 | 8 & 14 | 8 & 14 | 8 & 14 | 8 & 14 | 8 & 14 | 8 & 14 | 2 & 7 | 8 & 14 |  |  |  |  |  |
| Name (Dog) | 8 & 14 | 2 & 7 | 5 & 6 | 5 & 6 | 2 & 7 | 5 & 6 | 8 & 14 | 8 & 14 | 8 & 14 | 8 & 14 | 8 & 14 | 8 & 14 | 2 & 7 | 8 & 14 |  |  |  |  |  |
| Initial Contact | 8 & 14 | 2 & 7 | 5 & 6 | 5 & 6 | 2 & 7 | 5 & 6 | 8 & 14 | 8 & 14 | 8 & 14 | 8 & 14 | 8 & 14 | 8 & 14 | 2 & 7 | 8 & 14 |  |  |  |  |  |
| Final Contact | 8 & 14 | 2 & 7 | 5 & 6 | 5 & 6 | 2 & 7 | 5 & 6 | 8 & 14 | 8 & 14 | 8 & 14 | 8 & 14 | 8 & 14 | 8 & 14 | 2 & 7 | 8 & 14 | 1 & 2 | 1 & 2 | 1 & 2 |  | 1 & 3 |
| Number Of Samples | 8 & 14 | 2 & 7 | 5 & 6 | 5 & 6 | 2 & 7 | 5 & 6 | 8 & 14 | 8 & 14 | 8 & 14 | 8 & 14 | 8 & 14 | 8 & 14 | 2 & 7 | 8 & 14 | 1 & 2 | 1 & 2 | 1 & 2 | 4 & 8 |  |

**FDs from Universal Relation**

Species -> AvePHT

RegionID -> Size

StudyID -> RegionID

StudyID -> StudyName

StudyID -> ClassID

PartID -> Name

PartID -> InitialContact

PartID -> FinalContact

**FDs from Enterprise Statement Memo 1**

Species -> SpeciesName

RegionID -> RegionDesc

ClassID -> Type

StatusID -> Description

**FDs from Enterprise Statement Memo 3**

PartID (Dog) -> NumberOfSamples

PartID (RegionManager) -> RegionID

PartID (RegionManager) -> LastAccess

PartID (ProjectManager) -> NextProjectReview

PartID (LabTech) -> RegionID

**Unused Variables**

PHTValue

AnimalNumber

Location

SampleDate

SampleNumber

Sex

Status

**Educated Guess Composite Keys**

AnimalNumber, StudyID

SampleNumber, StudyID

**Composite Key FDs**

AnimalNumber, StudyID -> Sex

AnimalNumber, StudyID -> Species

SampleNumber, StudyID -> PHTValue

SampleNumber, StudyID -> Location

SampleNumber, StudyID -> SampleDate

SampleNumber, StudyID -> Status

SampleNumber, StudyID -> AnimalNumber

SampleNumber, StudyID -> PartID (Dog)

**FINAL LDM**

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**FINAL PDM**

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Description automatically generated**

**DML Insert Statements**

INSERT INTO Species VALUES ('E', 'Elephant', 110);

INSERT INTO Species VALUES ('C', 'Caribou', 60);

INSERT INTO Species VALUES ('D', 'Deer', 8.5);

INSERT INTO Species VALUES ('W', 'Wolf', 30);

INSERT INTO Species VALUES ('P', 'Puma', 30);

INSERT INTO Species VALUES ('A', 'Anteater', 10);

INSERT INTO Region VALUES ('AC', 'Alberta, CA', 20);

INSERT INTO Region VALUES ('AF', 'Africa', 50);

INSERT INTO Region VALUES ('BZ', 'Brazil', 70);

INSERT INTO Classification VALUES ('G', 'Government');

INSERT INTO Classification VALUES ('P', 'Private');

INSERT INTO Classification VALUES ('N', 'NGO (Non-Govt. Org.)');

INSERT INTO Study VALUES ('Cer-812', 'Cerrado', 'G', 'BZ');

INSERT INTO Study VALUES ('Za1-113', 'Zambia', 'N', 'AF');

INSERT INTO Study VALUES ('TS1-912', 'Tar Sands-1', 'P', 'AC');

INSERT INTO Study VALUES ('TS2-313', 'Tar Sands-2', 'G', 'AC');

INSERT INTO Animal VALUES (31, 'Cer-812', 'M', 'A');

INSERT INTO Animal VALUES (78, 'Za1-113', 'F', 'E');

INSERT INTO Animal VALUES (48, 'TS1-912', 'M', 'C');

INSERT INTO Animal VALUES (102, 'TS1-912', 'F', 'W');

INSERT INTO Animal VALUES (48, 'TS2-313', 'F', 'C');

INSERT INTO Animal VALUES (39, 'TS2-313', '?', 'C');

INSERT INTO Animal VALUES (107, 'Cer-812', 'F', 'A');

INSERT INTO Animal VALUES (101, 'TS2-313', 'M', 'D');

INSERT INTO Animal VALUES (55, 'TS1-912', 'M', 'D');

INSERT INTO Animal VALUES (55, 'Cer-812', 'F', 'P');

INSERT INTO Animal VALUES (55, 'Za1-113', 'M', 'E');

INSERT INTO Animal VALUES (102, 'Cer-812', 'F', 'W');

INSERT INTO Animal VALUES (52, 'Za1-113', 'M', 'E');

INSERT INTO Status VALUES (1, 'Sample exists');

INSERT INTO Status VALUES (0, 'Sample used up');

INSERT INTO Participant VALUES ('P0000', '2022-01-15', null, 'Bob Bureaucrat');

INSERT INTO Participant VALUES ('P0101', '2022-01-15', null, 'Sam Supervisor');

INSERT INTO Participant VALUES ('P0102', '2022-01-15', null, 'Mary Manager');

INSERT INTO Participant VALUES ('P0103', '2022-01-15', null, 'Fred Foreman');

INSERT INTO Participant VALUES ('P0201', '2021-08-15', null, 'Jane Brown');

INSERT INTO Participant VALUES ('P0207', '2022-08-15', null, 'Bill Smith');

INSERT INTO Participant VALUES ('P0214', '2022-08-15', null, 'Elicia47');

INSERT INTO Participant VALUES ('P0217', '2022-08-15', null, 'Anne Green');

INSERT INTO Participant VALUES ('P0219', '2022-08-15', null, 'Frank Black');

INSERT INTO Participant VALUES ('P0220', '2022-08-15', '2023-01-15', 'Joe Martin');

INSERT INTO Participant VALUES ('P1201', '2022-06-20', null, 'Cindy');

INSERT INTO Participant VALUES ('P1013', '2021-03-20', null, 'Max');

INSERT INTO Participant VALUES ('P1024', '2021-04-15', null, 'Casey');

INSERT INTO Participant VALUES ('P1203', '2022-09-01', null, 'Sampson');

INSERT INTO Participant VALUES ('P1023', '2022-07-12', null, 'Sunny');

INSERT INTO Participant VALUES ('P1202', '2022-06-01', '2022-10-01', 'Mason');

INSERT INTO Participant VALUES ('P1012', '2021-01-11', null, 'Bailey');

INSERT INTO Dog VALUES ('P1201', 4);

INSERT INTO Dog VALUES ('P1013', 4);

INSERT INTO Dog VALUES ('P1024', 1);

INSERT INTO Dog VALUES ('P1203', 2);

INSERT INTO Dog VALUES ('P1023', 3);

INSERT INTO Dog VALUES ('P1202', 2);

INSERT INTO Dog VALUES ('P1012', 1);

INSERT INTO Sample VALUES (16, 'Cer-812', 'Aug 2022', 'N1W1', 9.1, 1, 'P1201', 31);

INSERT INTO Sample VALUES (21, 'Za1-113', 'Dec 2021', 'S4E3', 119, 1, 'P1013', 78);

INSERT INTO Sample VALUES (43, 'TS1-912', 'Oct 2021', 'N2W1', 60, 0, 'P1024', 48);

INSERT INTO Sample VALUES (44, 'TS1-912', 'Nov 2022', 'N1W2', 34, 1, 'P1203', 102);

INSERT INTO Sample VALUES (46, 'TS1-912', 'Oct 2022', 'N2E4', 55, 1, 'P1023', 48);

INSERT INTO Sample VALUES (47, 'TS2-313', 'Oct 2022', 'N2W3', 50, 1, 'P1023', 48);

INSERT INTO Sample VALUES (55, 'TS2-313', 'Aug 2021', 'N1W1', 55.5, 1, 'P1013', 39);

INSERT INTO Sample VALUES (58, 'Cer-812', 'Jul 2022', 'N1E5', 16, 1, 'P1202', 107);

INSERT INTO Sample VALUES (78, 'TS2-313', 'Aug 2022', 'N1W1', 7, 1, 'P1023', 101);

INSERT INTO Sample VALUES (81, 'TS1-912', 'Dec 2021', 'S2E2', 9.2, 1, 'P1012', 55);

INSERT INTO Sample VALUES (99, 'Cer-812', 'Aug 2022', 'S2E2', 35, 1, 'P1201', 55);

INSERT INTO Sample VALUES (67, 'Za1-113', 'Aug 2022', 'N1W1', 116, 1, 'P1013', 55);

INSERT INTO Sample VALUES (26, 'Cer-812', 'Sep 2022', 'N1W1', 9.2, 1, 'P1201', 31);

INSERT INTO Sample VALUES (10, 'Cer-812', 'Aug 2022', 'N2E3', 30, 0, 'P1202', 102);

INSERT INTO Sample VALUES (16, 'TS1-912', 'Dec 2022', 'N1W3', 32, 1, 'P1203', 102);

INSERT INTO Sample VALUES (82, 'Cer-812', 'Sep 2022', 'N1E5', 34, 1, 'P1201', 55);

INSERT INTO Sample VALUES (44, 'Za1-113', 'Aug 2022', 'N1W1', 115, 0, 'P1013', 52);

INSERT INTO RegionManager VALUES ('P0101', 'AC', null);

INSERT INTO RegionManager VALUES ('P0102', 'AF', null);

INSERT INTO RegionManager VALUES ('P0103', 'BZ', null);

INSERT INTO ProjectManager VALUES ('P0000', null);

INSERT INTO LabTechs VALUES ('P0201', 'BZ');

INSERT INTO LabTechs VALUES ('P0207', 'AF');

INSERT INTO LabTechs VALUES ('P0214', 'AC');

INSERT INTO LabTechs VALUES ('P0217', 'AC');

INSERT INTO LabTechs VALUES ('P0219', 'AF');

INSERT INTO LabTechs VALUES ('P0220', 'AF');

**Select Statement Results**

SELECT \* FROM Species;

SpeciesCode SpeciesName AvePHT

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A Anteater 10.0

C Caribou 60.0

D Deer 8.5

E Elephant 110.0

P Puma 30.0

W Wolf 30.0

(6 rows affected)

SELECT \* FROM Region;

RegionID RegionDesc Size

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AC Alberta, CA 20

AF Africa 50

BZ Brazil 70

(3 rows affected)

SELECT \* FROM Classification;

ClassID Type

------- --------------------

G Government

N NGO (Non-Govt. Org.)

P Private

(3 rows affected)

SELECT \* FROM Study;

StudyID StudyName ClassID RegionID

------- ----------- ------- --------

Cer-812 Cerrado G BZ

TS1-912 Tar Sands-1 P AC

TS2-313 Tar Sands-2 G AC

Za1-113 Zambia N AF

(4 rows affected)

SELECT \* FROM Animal;

AnimalNum StudyID Sex SpeciesCode

----------- ------- ---- -----------

31 Cer-812 M A

39 TS2-313 ? C

48 TS1-912 M C

48 TS2-313 F C

52 Za1-113 M E

55 Cer-812 F P

55 TS1-912 M D

55 Za1-113 M E

78 Za1-113 F E

101 TS2-313 M D

102 Cer-812 F W

102 TS1-912 F W

107 Cer-812 F A

(13 rows affected)

SELECT \* FROM Status;

StatusID StatusDesc

----------- --------------

0 Sample used up

1 Sample exists

(2 rows affected)

SELECT \* FROM Participant;

PartID InitialContact FinalContact Name

------ -------------- ------------ --------------

P0000 2022-01-15 NULL Bob Bureaucrat

P0101 2022-01-15 NULL Sam Supervisor

P0102 2022-01-15 NULL Mary Manager

P0103 2022-01-15 NULL Fred Foreman

P0201 2021-08-15 NULL Jane Brown

P0207 2022-08-15 NULL Bill Smith

P0214 2022-08-15 NULL Elicia47

P0217 2022-08-15 NULL Anne Green

P0219 2022-08-15 NULL Frank Black

P0220 2022-08-15 2023-01-15 Joe Martin

P1012 2021-01-11 NULL Bailey

P1013 2021-03-20 NULL Max

P1023 2022-07-12 NULL Sunny

P1024 2021-04-15 NULL Casey

P1201 2022-06-20 NULL Cindy

P1202 2022-06-01 2022-10-01 Mason

P1203 2022-09-01 NULL Sampson

(17 rows affected)

SELECT \* FROM Dog;

PartID NumberOfSamples

------ ---------------

P1012 1

P1013 4

P1023 3

P1024 1

P1201 4

P1202 2

P1203 2

(7 rows affected)

SELECT \* FROM Sample;

SampleID StudyID Date Location PHTValue StatusID PartIDDog AnimalNum

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10 Cer-812 Aug 2022 N2E3 30.0 0 P1202 102

16 Cer-812 Aug 2022 N1W1 9.1 1 P1201 31

16 TS1-912 Dec 2022 N1W3 32.0 1 P1203 102

21 Za1-113 Dec 2021 S4E3 119.0 1 P1013 78

26 Cer-812 Sep 2022 N1W1 9.2 1 P1201 31

43 TS1-912 Oct 2021 N2W1 60.0 0 P1024 48

44 TS1-912 Nov 2022 N1W2 34.0 1 P1203 102

44 Za1-113 Aug 2022 N1W1 115.0 0 P1013 52

46 TS1-912 Oct 2022 N2E4 55.0 1 P1023 48

47 TS2-313 Oct 2022 N2W3 50.0 1 P1023 48

55 TS2-313 Aug 2021 N1W1 55.5 1 P1013 39

58 Cer-812 Jul 2022 N1E5 16.0 1 P1202 107

67 Za1-113 Aug 2022 N1W1 116.0 1 P1013 55

78 TS2-313 Aug 2022 N1W1 7.0 1 P1023 101

81 TS1-912 Dec 2021 S2E2 9.2 1 P1012 55

82 Cer-812 Sep 2022 N1E5 34.0 1 P1201 55

99 Cer-812 Aug 2022 S2E2 35.0 1 P1201 55

(17 rows affected)

SELECT \* FROM RegionManager;

PartID RegionID LastAccess

------ -------- ----------

P0101 AC NULL

P0102 AF NULL

P0103 BZ NULL

(3 rows affected)

SELECT \* FROM ProjectManager;

PartID NextProjectReview

------ -----------------

P0000 NULL

(1 row affected)

SELECT \* FROM LabTechs;

PartID RegionID

------ --------

P0201 BZ

P0207 AF

P0214 AC

P0217 AC

P0219 AF

P0220 AF

(6 rows affected)

**Universal Relation Memo 3**

Select A.SpeciesCode, St.RegionID, St.StudyName, St.StudyID, R.Size, St.ClassID, Sp.AvePHT, Sa.PHTValue, Sa.AnimalNum,

Sa.Location, Sa.Date, Sa.SampleID, A.Sex, Sa.StatusID, Sa.PartIDDog, P.Name, P.InitialContact, P.FinalContact, D.NumberOfSamples

FROM Region as R, Study as St, Sample as Sa, Animal as A, Species as Sp, Participant as P, Dog as D

WHERE R.RegionID = St.RegionID AND St.StudyID = Sa.StudyID AND Sa.StudyID = A.StudyID AND Sa.AnimalNum = A.AnimalNum

AND A.SpeciesCode = Sp.SpeciesCode AND P.PartID = Sa.PartIDDog AND P.PartID = D.PartID

ORDER BY SampleID;

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**Typical Queries and Results**

1. **What is the largest physiological health value observed for a caribou?**

Select Sp.SpeciesCode, Sp.SpeciesName, MAX(Sa.PHTValue) As LargestObservedPHT

FROM Sample as Sa

JOIN Animal as A ON Sa.AnimalNum = A.AnimalNum AND Sa.StudyID = A.StudyID

JOIN Species as Sp ON Sp.SpeciesCode = A.SpeciesCode

WHERE Sp.SpeciesCode = 'C'

GROUP BY Sp.SpeciesCode, Sp.SpeciesName;

SpeciesCode SpeciesName LargestObservedPHT

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C Caribou 60.0

(1 row affected)

1. **For each animal, list all of it’s physiological health value measurements in chronological date order.**

Select A.AnimalNum, A.StudyID, A.SpeciesCode, Sp.SpeciesName, Sa.PHTValue, Sa.Date

FROM Sample as Sa

JOIN Animal as A ON A.AnimalNum = Sa.AnimalNum AND A.StudyID = Sa.StudyID

JOIN Species as Sp ON Sp.SpeciesCode = A.SpeciesCode

ORDER BY AnimalNum, StudyID, CAST(Sa.Date AS DATE);

AnimalNum StudyID SpeciesCode SpeciesName PHTValue Date

----------- ------- ----------- ----------- --------------------------------------- --------

31 Cer-812 A Anteater 9.1 Aug 2022

31 Cer-812 A Anteater 9.2 Sep 2022

39 TS2-313 C Caribou 55.5 Aug 2021

48 TS1-912 C Caribou 60.0 Oct 2021

48 TS1-912 C Caribou 55.0 Oct 2022

48 TS2-313 C Caribou 50.0 Oct 2022

52 Za1-113 E Elephant 115.0 Aug 2022

55 Cer-812 P Puma 35.0 Aug 2022

55 Cer-812 P Puma 34.0 Sep 2022

55 TS1-912 D Deer 9.2 Dec 2021

55 Za1-113 E Elephant 116.0 Aug 2022

78 Za1-113 E Elephant 119.0 Dec 2021

101 TS2-313 D Deer 7.0 Aug 2022

102 Cer-812 W Wolf 30.0 Aug 2022

102 TS1-912 W Wolf 34.0 Nov 2022

102 TS1-912 W Wolf 32.0 Dec 2022

107 Cer-812 A Anteater 16.0 Jul 2022

(17 rows affected)

1. **In what region is the Zambia Study and how big is the region?**

Select St.StudyName, St.StudyID, R.RegionID, R.RegionDesc, R.Size

FROM Region as R

JOIN Study as St ON R.RegionID = St.RegionID

WHERE St.StudyName = 'Zambia';

StudyName StudyID RegionID RegionDesc Size

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Zambia Za1-113 AF Africa 50

(1 row affected)

1. **List the animals that are within 5 units of their average physiological health value.**

SELECT MostRecentSample.AnimalNum, MostRecentSample.StudyID

FROM (

SELECT A.AnimalNum, A.StudyID, MAX(CAST(Sa.Date AS Date)) AS SampleDate

FROM Sample AS Sa

JOIN Animal AS A ON A.AnimalNum = Sa.AnimalNum AND A.StudyID = Sa.StudyID

JOIN Species as Sp ON Sp.SpeciesCode = A.SpeciesCode

WHERE Sp.AvePHT + 5 > Sa.PHTValue AND Sp.AvePHT - 5 < Sa.PHTValue

GROUP BY A.AnimalNum, A.StudyID)

MostRecentSample;

AnimalNum StudyID

----------- -------

31 Cer-812

39 TS2-313

48 TS1-912

55 Cer-812

55 TS1-912

101 TS2-313

102 Cer-812

102 TS1-912

(8 rows affected)

1. **List the sample information for the Tar Sands studies made in October and November 2022.**

SELECT Sa.SampleID, Sa.StudyID, St.StudyName, Sa.Date, Sa.Location, Sa.PHTValue, Sa.StatusID, S.StatusDesc, Sa.PartIDDog, Sa.AnimalNum

FROM Status AS S

JOIN Sample AS Sa ON S.StatusID = Sa.StatusID

JOIN Study AS St ON St.StudyID = Sa.StudyID

WHERE St.StudyName LIKE 'Tar Sands%' AND (Sa.Date = 'Oct 2022' OR Sa.Date = 'Nov 2022');

SampleID StudyID StudyName Date Location PHTValue StatusID StatusDesc PartIDDog AnimalNum

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44 TS1-912 Tar Sands-1 Nov 2022 N1W2 34.0 1 Sample exists P1203 102

46 TS1-912 Tar Sands-1 Oct 2022 N2E4 55.0 1 Sample exists P1023 48

47 TS2-313 Tar Sands-2 Oct 2022 N2W3 50.0 1 Sample exists P1023 48

(3 rows affected)

1. **What studies have animals for which samples were gathered in August 2022?**

Select DISTINCT(Sa.StudyID), St.StudyName

FROM Sample AS Sa

JOIN Study AS St ON Sa.StudyID = St.StudyID

WHERE Sa.Date = 'Aug 2022';

StudyID StudyName

------- -----------

Cer-812 Cerrado

TS2-313 Tar Sands-2

Za1-113 Zambia

(3 rows affected)

1. **What type of funding supports the Cerrado study?**

SELECT St.StudyName, St.StudyID, St.ClassID, C.Type

FROM Study AS St

JOIN Classification AS C ON St.ClassID = C.ClassID

WHERE St.StudyName = 'Cerrado';

StudyName StudyID ClassID Type

----------- ------- ------- --------------------

Cerrado Cer-812 G Government

(1 row affected)

1. **Who (Name and ID) manages the Africa region?**

SELECT M.RegionID, R.RegionDesc, P.PartID, P.Name

FROM Participant AS P

JOIN RegionManager AS M ON M.PartID = P.PartID

JOIN Region AS R ON R.RegionID = M.RegionID

WHERE M.RegionID = 'AF';

RegionID RegionDesc PartID Name

-------- ----------- ------ --------------

AF Africa P0102 Mary Manager

(1 row affected)

1. **Who (Name and ID) has access data on Alberta Canada measurements?**

SELECT L.RegionID, R.RegionDesc, P.PartID, P.Name

FROM Participant AS P

JOIN LabTechs AS L ON L.PartID = P.PartID

JOIN Region AS R ON R.RegionID = L.RegionID

WHERE L.RegionID = 'AC';

RegionID RegionDesc PartID Name

-------- ----------- ------ --------------

AC Alberta, CA P0214 Elicia47

AC Alberta, CA P0217 Anne Green

(2 rows affected)

1. **How many times has each animal been sampled?**

SELECT A.AnimalNum, A.StudyID, COUNT(Sa.SampleID) AS NumberOfAnimalSamples

FROM Animal AS A

JOIN Sample AS Sa ON A.AnimalNum = Sa.AnimalNum AND A.StudyID = Sa.StudyID

GROUP BY A.AnimalNum, A.StudyID;

AnimalNum StudyID NumberOfAnimalSamples

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31 Cer-812 2

39 TS2-313 1

48 TS1-912 2

48 TS2-313 1

52 Za1-113 1

55 Cer-812 2

55 TS1-912 1

55 Za1-113 1

78 Za1-113 1

101 TS2-313 1

102 Cer-812 1

102 TS1-912 2

107 Cer-812 1

(13 rows affected)

1. **List the samples analyzed by P0201.**

SELECT Sa.SampleID, Sa.StudyID

FROM LabTechs AS L

JOIN Region AS R ON L.RegionID = R.RegionID

JOIN Study AS St ON St.RegionID = R.RegionID

JOIN Sample AS Sa ON Sa.StudyID = St.StudyID

WHERE L.PartID = 'P0201'

SampleID StudyID

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10 Cer-812

16 Cer-812

26 Cer-812

58 Cer-812

82 Cer-812

99 Cer-812

(6 rows affected)

* 1. **Why will question 11 not work for P0207?**

**Lab Techs are assigned to Regions not the samples themselves. In the case of Lab Tech P0201 they are the only lab tech for the Brazil region so all samples in the region have been analyzed by the Lab Tech as they are the only one. This is not the same for Lab Tech P0207 as they are not the only tech for the region and therefore it is not possible using the database as it currently is to determine which samples in the region were analysed by P0207.**

1. **List the dogs that have worked in each region.**

SELECT R.RegionID, R.RegionDesc, Sa.PartIDDog, P.Name

FROM Region AS R

JOIN Study AS St ON St.RegionID = R.RegionID

JOIN Sample AS Sa ON Sa.StudyID = St.StudyID

JOIN Dog AS D ON D.PartID = Sa.PartIDDog

JOIN Participant AS P ON P.PartID = D.PartID

GROUP BY R.RegionID, R.RegionDesc, Sa.PartIDDog, P.Name

ORDER BY R.RegionID;

RegionID RegionDesc PartIDDog Name

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AC Alberta, CA P1012 Bailey

AC Alberta, CA P1013 Max

AC Alberta, CA P1023 Sunny

AC Alberta, CA P1024 Casey

AC Alberta, CA P1203 Sampson

AF Africa P1013 Max

BZ Brazil P1201 Cindy

BZ Brazil P1202 Mason

(8 rows affected)

**LDM & PDM Memo 3 Version**

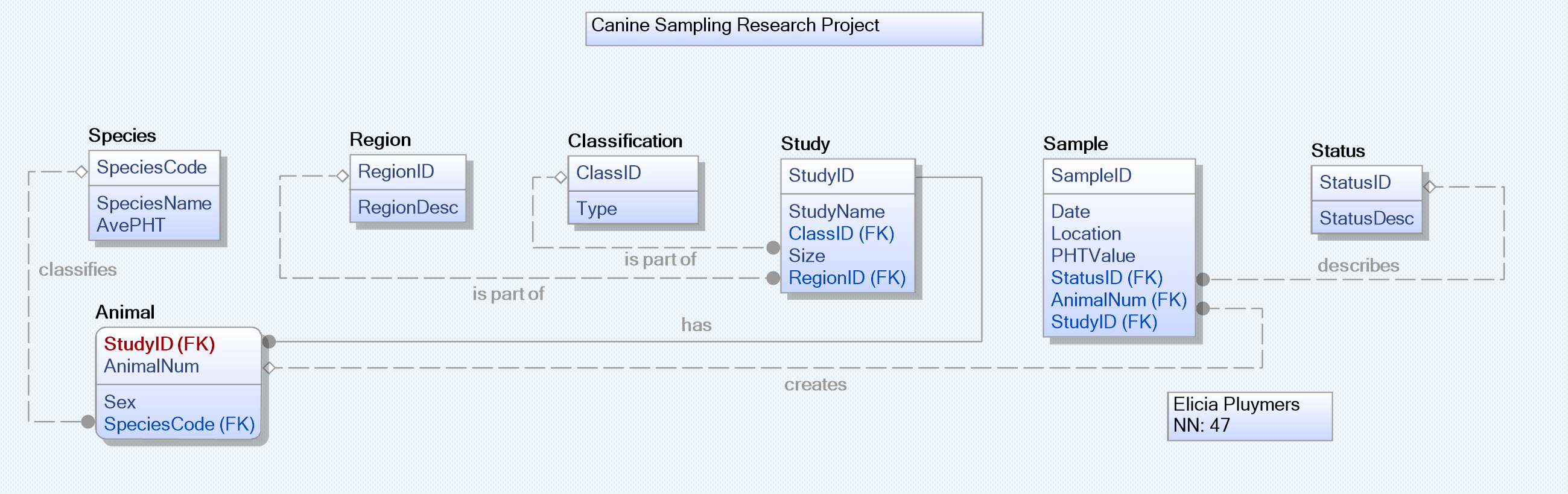
A screenshot of a computer

Description automatically generated with medium confidence

A screenshot of a computer

Description automatically generated with medium confidence

**LDM & PDM Memo 2R Version**

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**A screenshot of a computer

Description automatically generated with medium confidence**

**LDM Memo 2 Version**

A screenshot of a computer

Description automatically generated with medium confidence

**Erwin Table Creation Statements**

CREATE TABLE Species

(

SpeciesCode char(1) NOT NULL ,

SpeciesName char(8) NULL ,

AvePHT decimal(4,1) NULL ,

PRIMARY KEY CLUSTERED (SpeciesCode ASC)

)

go

CREATE TABLE Region

(

RegionID char(2) NOT NULL ,

RegionDesc char(11) NULL ,

Size int NULL ,

PRIMARY KEY CLUSTERED (RegionID ASC)

)

go

CREATE TABLE Classification

(

ClassID char(1) NOT NULL ,

Type char(20) NULL ,

PRIMARY KEY CLUSTERED (ClassID ASC)

)

go

CREATE TABLE Study

(

StudyID char(7) NOT NULL ,

StudyName char(11) NULL ,

ClassID char(1) NULL ,

RegionID char(2) NULL ,

PRIMARY KEY CLUSTERED (StudyID ASC),

FOREIGN KEY (RegionID) REFERENCES Region(RegionID),

FOREIGN KEY (ClassID) REFERENCES Classification(ClassID)

)

go

CREATE TABLE Animal

(

AnimalNum int NOT NULL ,

StudyID char(7) NOT NULL ,

Sex char(1) NULL ,

SpeciesCode char(1) NULL ,

PRIMARY KEY CLUSTERED (AnimalNum ASC,StudyID ASC),

FOREIGN KEY (SpeciesCode) REFERENCES Species(SpeciesCode),

FOREIGN KEY (StudyID) REFERENCES Study(StudyID)

)

go

CREATE TABLE Status

(

StatusID int NOT NULL ,

StatusDesc char(14) NULL ,

PRIMARY KEY CLUSTERED (StatusID ASC)

)

go

CREATE TABLE Participant

(

PartID char(5) NOT NULL ,

InitialContact date NULL ,

FinalContact date NULL ,

Name char(14) NULL ,

PRIMARY KEY CLUSTERED (PartID ASC)

)

go

CREATE TABLE Dog

(

PartID char(5) NOT NULL ,

NumberOfSamples int NULL ,

PRIMARY KEY CLUSTERED (PartID ASC),

FOREIGN KEY (PartID) REFERENCES Participant(PartID)

)

go

CREATE TABLE Sample

(

SampleID int NOT NULL ,

StudyID char(7) NOT NULL ,

Date char(8) NULL ,

Location char(4) NULL ,

PHTValue decimal(4,1) NULL ,

StatusID int NULL ,

PartIDDog char(5) NULL ,

AnimalNum int NULL ,

PRIMARY KEY CLUSTERED (SampleID ASC,StudyID ASC),

FOREIGN KEY (StatusID) REFERENCES Status(StatusID),

FOREIGN KEY (PartIDDog) REFERENCES Dog(PartID),

FOREIGN KEY (AnimalNum,StudyID) REFERENCES Animal(AnimalNum,StudyID),

FOREIGN KEY (StudyID) REFERENCES Study(StudyID)

)

go

CREATE TABLE RegionManager

(

PartID char(5) NOT NULL ,

RegionID char(2) NULL ,

LastAccess date NULL ,

PRIMARY KEY CLUSTERED (PartID ASC),

FOREIGN KEY (PartID) REFERENCES Participant(PartID),

FOREIGN KEY (RegionID) REFERENCES Region(RegionID)

)

go

CREATE TABLE ProjectManager

(

PartID char(5) NOT NULL ,

NextProjectReview date NULL ,

PRIMARY KEY CLUSTERED (PartID ASC),

FOREIGN KEY (PartID) REFERENCES Participant(PartID)

)

go

CREATE TABLE LabTechs

(

PartID char(5) NOT NULL ,

RegionID char(2) NULL ,

PRIMARY KEY CLUSTERED (PartID ASC),

FOREIGN KEY (PartID) REFERENCES Participant(PartID),

FOREIGN KEY (RegionID) REFERENCES Region(RegionID)

)

go