

Title Animal Foster/Adoption Database Design Assignment

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Database Design Assignment Part A

A.1. Case Study Overview

Awlnsw.com.au belongs to Animal Welfare League NSW™, and its primary function is that provide animal adoption and foster service.

For the adoption, Applicants can make requests directly under the option of adopting cats, dogs and other animals, or use the website searcher to search with animal species, genders and locations(see figure 1 below).

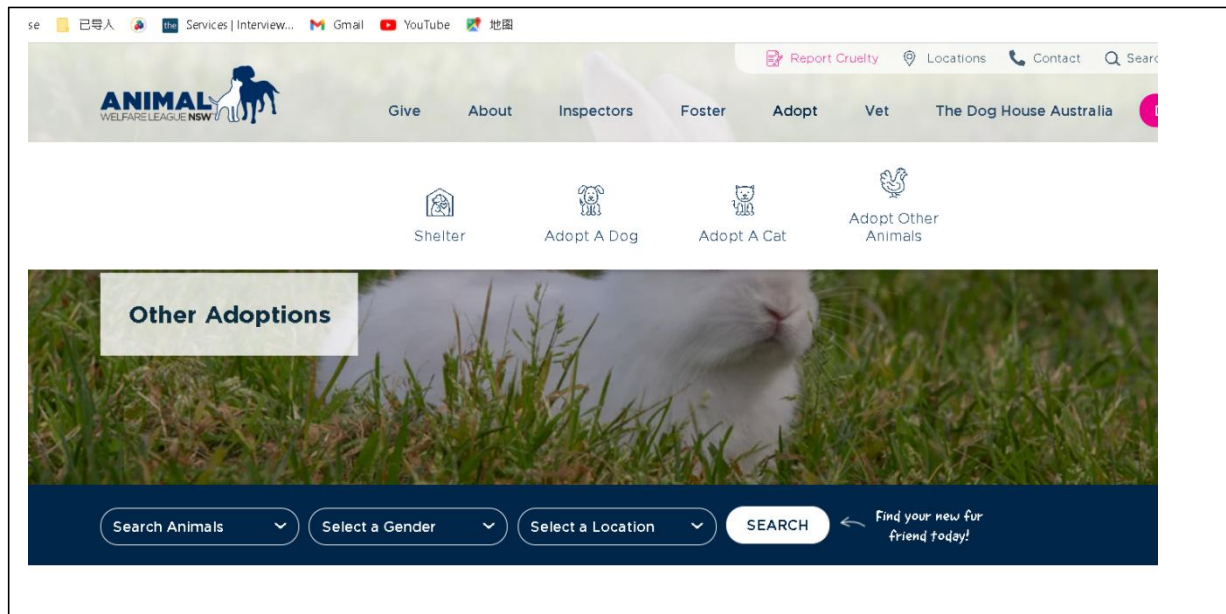


figure 1

After receiving the applicant's personal information and a brief description of the applicant's lifestyle, the staff will directly communicate with the applicant(see figure 2 below).

 The screenshot shows a contact form titled 'Want to learn more?'. The form includes a sub-header: 'Complete the form below, and we'll be in touch with additional information about the dog you've been looking at!'. The form fields are: 'Full Name*', 'Phone*', 'Email*', 'Suburb*', and a dropdown menu for 'New South Wales'. Below these fields is a large text area with the prompt 'Please tell us a bit about you and your family, your home and your lifestyle*'. At the bottom left, there is a checkbox for 'I'm not a robot' and a reCAPTCHA logo. At the bottom center, there is a dark blue button labeled 'ENQUIRE NOW'. At the bottom right, there is a checkbox for 'Keep me updated about Animal Welfare League NSW events via email'.

figure 2

According to the website, after selecting the adopted Animal, the adopter must pay the adoption fee to the shelter or branch.

The process of fostering states that applicants must fill out the corresponding application form after connecting and negotiating with the AWL NSW coordinator. There are three application forms with two application methods. The first method is that fill in the "foster care application form"(figure 3) after selecting a branch. The second method is to fill in the form of "cat foster care signup"(figure 4) or "dog foster care signup" (figure 5) after selecting the cats or dogs that are available to be adopted.

The screenshot shows the 'Foster Care Application Form' with a header and a thank-you message. It includes a contact email 'zheng.wang@911@gmail.com' and a 'Save' button. The form has several sections: 'Email Address' with a red border and a warning icon, 'Please read and accept' with a checked checkbox, 'Please contact branch BEFORE applying' with a checked checkbox, and 'Please choose your closest AWL NSW branch' with a dropdown menu showing 'Eastern Suburbs'.

figure 3

The screenshot shows the 'Cat Foster Care Signup' form. It includes a thank-you message and a list of requirements for being an AWL NSW foster carer. The 'Foster Carer Details' section contains fields for Name (First and Last), Address (Street, Suburb, and Post Code), State (NSW), Phone Number, Email, and a radio button for 'I live in a' with options 'House' and 'Apartment'.

figure 4

The screenshot shows the 'Dog Foster Care Signup' form. It includes a thank-you message and a list of requirements for being an AWL NSW foster carer. The 'Foster Carer Details' section contains fields for Name (First and Last), Address (Street, Suburb, and Post Code), State (NSW), Phone Number, Email, and a radio button for 'I live in a' with options 'House', 'Apartment', and 'Other'.

figure 5

In the "foster care application form", the applicant's email is first confirmed as a personal account. General information such as the applicant's personal information, home address and contact information must be provided. The applicant must provide the name and age of the people who live with the applicant. The details of the applicant's pets must be given in the related form(figure 6).

What are the names and ages of everyone who lives in the household, including you? *

Name *	Age *
<input type="text"/>	<input type="text"/>
<input type="button" value="+"/>	

Details of current pets (if any) *

Are current pets desexed and up-to-date with vaccinations and flea/worming treatment? *

☐ Yes
☐ No
☐ I have no pets
☒ Other

Please describe any prior experience with owning animals or fostering. *

Type here...

This field is required.

figure 6

The applicants must select "consider adopting cats or dogs or both" and express whether he is willing to adopt animals other than cats and dogs. The applicants must choose the type of cat or dog to adopt (figure 7).

Are you interested in fostering animals other than dogs/cats? (i.e. rabbits, guinea pigs etc). If so, what animals?

yes

What are you interested in fostering? *

☐ Cats/kittens
☐ Dogs/puppies
☒ Both

I want to foster: *

☒ Adult cats
☒ Litter of kittens (weaned, eating by themselves)
☒ Timid kittens that need socialisation
☐ Mum & kittens
☒ Cats/kittens with ringworm
☐ Bottle babies (Previous experience or training required, vet nurses also accepted)
☒ Overnight foster for bottle babies in emergencies (Previous experience or training required, vet nurses also accepted)

I want to foster: *

☐ (most needed) Medium-large dogs requiring training/socialisation
☒ Puppies
☐ Surgical recovery/medical attention
☐ Mums & pups
☒ Small dogs needing training/socialisation

I can foster: *

☐ Adult cat
☐ Adult cats that require cage rest (must remain in a crate provided by us whilst healing from an injury)
☐ Litter of kittens (4 weeks - 4 months, eating by themselves)
☐ Timid kittens that require socialisation
☐ Mum & kittens
☐ Cats/kittens with ringworm: See bit.ly/cat-ringworm for info

Would you consider fostering a timid cat? Our 'most urgent' cats needing foster care are timid. They become friendly with time, patience, daily training and they suit quiet homes where they can stay for at least 5+ weeks. We provide full support and a guide to help: bit.ly/timidcatguide *

☐ I am open to fostering a timid cat
☐ Not yet

Are you open to fostering bottle baby kittens (newborn - 4 weeks old)? Newborns initially require feeds every 2 hours, 24/7 *

☐ Yes
☐ Overnight foster for bottle babies in emergencies
☐ Not at the moment
☐ Other

I can foster: *

☐ Adult dogs
☐ Puppies
☐ Timid dogs or puppies
☐ Dogs with health concerns
☐ Dogs with behavioural concerns

Would you consider fostering one of our 'special cases'? Some dogs have been in the shelter too long and need urgent foster care. These dogs require some extra attention *

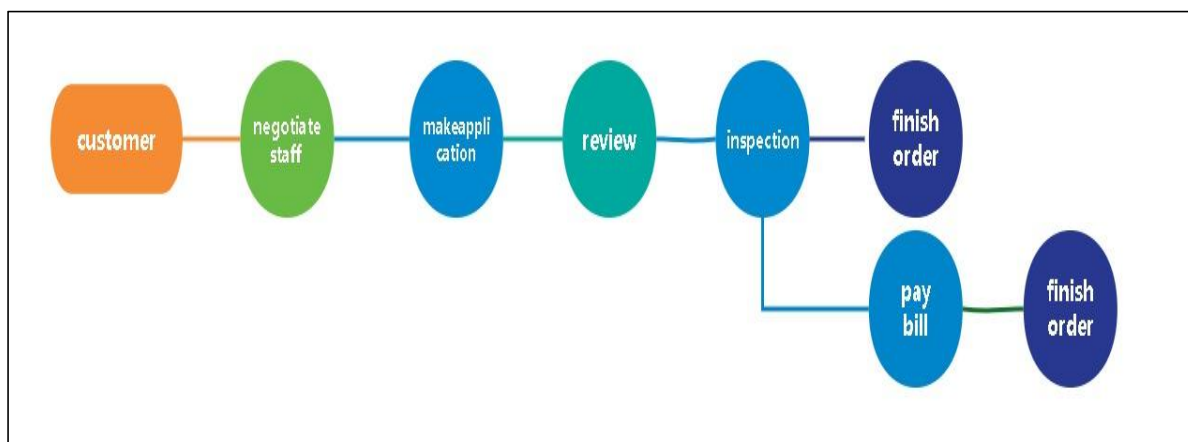
☐ I am open to fostering a 'Special Case' dog
☐ Not yet

figure 7

"Cat foster care signup" and "dog foster care signup" are similar. After providing personal information and expressing the foster care intention, choose the type of foster cats and dogs.

Once the application is accepted, the applicant's residence will be inspected by the coordinator. The coordinator will decide whether the applicant's residence is suitable for adoption. If the application is approved, the Animal will be transported with the coordinator's help.

So the complete adoption and foster workflow are as below:



A.2. Database Functions

The database must have the function of storing adequate information for all the animals. This information has to meet the requirement of presenting, indexing and researching. The system must identify whether the customer order (application form) is consistent with the applied animals' details. Each Animal needs to have a unique identification code to avoid duplicate information.

The customer's relevant information is classified and stored according to the specified form. The reviewer can call this information along with the customer's basic information and the customer's order for order review.

The database must give the customer order (application form) a unique identification code. The database must store the applicant's personal information and identify the approximate distance between the branch and the applicant's residence. At the same time, the database can match the foster care needs and animal characteristics according to the application form options. For example, the applicant accepts timid dogs or cats with ringworm

The database must define, store and record the information of branches and staff. The branch information and the animal information that can be adopted or fostered in the branch can be presented separately. As there are statements in the application, staff must review each application. According to the website statement, the coordinator will conduct inspections and assist in the delivery of animals. Therefore, the database must have the function of matching the application with the reviewer and coordinator.

After a specific order is completed, the system can generate a bill.

A.3. Data Requirements

Customer: a customer refers to an applicant with a unique ID provided by the system as identification and contains personal information as required attributes.

Attributes: Cust_ID, Cust_Email, Cust_Fname, Cust_Lname, Cust_Pho, Cust_Street, Cust_Sub, Cust_City, Cust_State, Cust_POcode, Cust_DrivLN.

Order: an order refers to a single application made by a customer, with a unique order number and details about the customer for a specific order. The customer details include housing type, family members and agreement, foster care experience, time for foster care, and travel plan within two months required.

Attributes: Order_ID, Cust_ID, Order_LivTp, Order_Exp, Order_Starttime, Order_Trav, Order_Famagr.

Customer_people: The entity stores data about the members or people living together. Every person has a unique ID provided by the system

Attributes: Cust_peopleID, Cust_peoplename, Cust_peopleage.

Customer_pet: The entity stores the data about current pets belonging to a customer. Every pet has a unique ID provided by the system.

Attributes: Cust_PetID, Cust_PetName, Cust_PetSpecie, Cust_PetDesexed, Cust_PetVacc, Cust_PetFWT.

Branch: A branch refers to the branch where the Animal is applied for foster care /adoption or the branch that can meet the demand of the order and finally implement the adoption/foster care. It contains branch information such as

required attributes address, phone number, email address, location, and optional attribute open schedule. The branch code is a unique identification.

Attributes: Bra_Code, Bra_name, Bra_Pho, Bra_Street, Bra_Sub, Bra_City, Bra_t_POcode, Bra_Email, Bra_Open.

Staff: Staff refers to employees participating in the adoption and foster care process. All employees are assigned a unique employee number to identify employee information, which contains the employees' names, email addresses, and mobile numbers.

Attributes: Staff_Code, Staff_Fname, Staff_Lname, Staff_Email, Staff_Mob.

Reviewer: reviewer needs to connect with customers by phone and by official email.

Attributes: Staff_Pho, OfficialEmail

Coordinator: coordinator needs to inspect customers' homes in person. So, coordinators should have vehicles and be located in the branch.

Attributes: Staff_Veh.

Animal: A animal refers to the animals for adoption or foster. Animals are uniquely identified by animal numbers. The entity contains name, classification, specie, age, breed, second breed, size, and comment.

Attributes: Anim_Num, Anim_Name, Anim_Type, Anim_Specie, Anim_Colour, Anim_Age, Anim_Breed, Anim_SecBreed, Anim_Size, Anim_chip, Anim_Comm.

Animal for adoption: A animal for adoption refers to a specific animal for adoption with price(adoption fee) and other information such as desexed, rehoming organization number, vaccination, health check, and wormed.

Attributes: Anim_Price, Anim_Des, Anim_Vaccin, Anim_HC, Anim_RON, Anim_Wor.

Animal for foster:

Animal for foster detail: A animal for foster refers to a specific animal for foster with detailed information. It stores detailed codes and details explanations. It inclouds Dog, Puppy, Timid dogs or puppies, Dogs with health concerns,

Dogs with behavioural concerns, Special Case dogs, Adult cat, Adult cat cage, Litter of kitten, Timid kittens that require socialization, Mum & kittens, Cats/kittens with ringworm, timid cat, bottle baby kittens.

Attributes: Detail_Code, Detail_Exp

Adopt

Bill: Bills are created when the adoption application is approved

Attributes: Bill_No, Bill_Date

A.4. Business Rules

1. Customers must fill out the application and provide information, including personal information. The system gives each application a unique number.
2. The information on the application provided by the consumer is classified and stored by the system, including consumer personal information, description and explanation suitable for foster care/adoption.
3. Customers have to provide information about their pets.
4. Customers have to provide information about the people living with them.
5. Customers have to state their needs if they apply to foster an animal.
6. Every application is for one Animal, and each customer can make applications for different animals.
7. Every application will be reviewed by one staff.
8. Each reviewer is given a phone and an official email account to connect with customers.
9. Each coordinator has a vehicle. Once an application is approved, a coordinator is in charge of inspection and helping animal delivery.
10. Staff can be a reviewer or a coordinator.
11. Each staff and Animal have to be located in one branch. Each branch has at least one staff, and each branch may have animals.
12. An animal can only be fostered or adopted.
13. Animals for foster have to be detailed to meet the needs of customers.
14. Customers may be issued a bill identified by a unique number.

Database Design Assignment Part B

B.1. Overview of the case study in at most five sentences (From part A)

Animal Welfare League NSW™(awlnsw.com.au) aims to provide appropriate foster care and adoption families for animals that have lost their homes.

According to the statement on the website, after confirming the relevant information with the staff by phone, the applicant can apply for adoption or foster care through the website and provide complete personal information, family members or co-residents information, and current pet information.

The branch staff will review the application form, and the coordinator will conduct an on-site inspection of the applicant's home to determine whether it is consistent with the application.

After the reviewer and the coordinator approve the application, the system will generate a bill for the adopter, and the coordinator will assist in delivering the Animal.

Each Animal for foster care will have one or more details, which will be selected by the applicant in the application to find a suitable applicant for each Animal.

B.2. Revised Business rules and Assumptions

Assumptions

According to the website's requirements, each applicant must communicate with the staff by telephone before filling in the application form through the website, so it is assumed that the formal process starts from filling in the application form. There is no need for data and operation before filling in the application.

Only the reviewer and the coordinator are involved in the application process. According to business, every staff has a manager. A manager can manage many staffs or no staff. Every staff are supervised by only one manager.

The website uses different application forms (more than three). It is assumed that the system has the identification function and can classify and store the information of different application forms in different modules and automatically generate the information required by the reviewer and coordinator.

The system has to record the health check date.

The system has to record the details record date.

Assumption: the system has to record the date of selecting details.

Business rules:

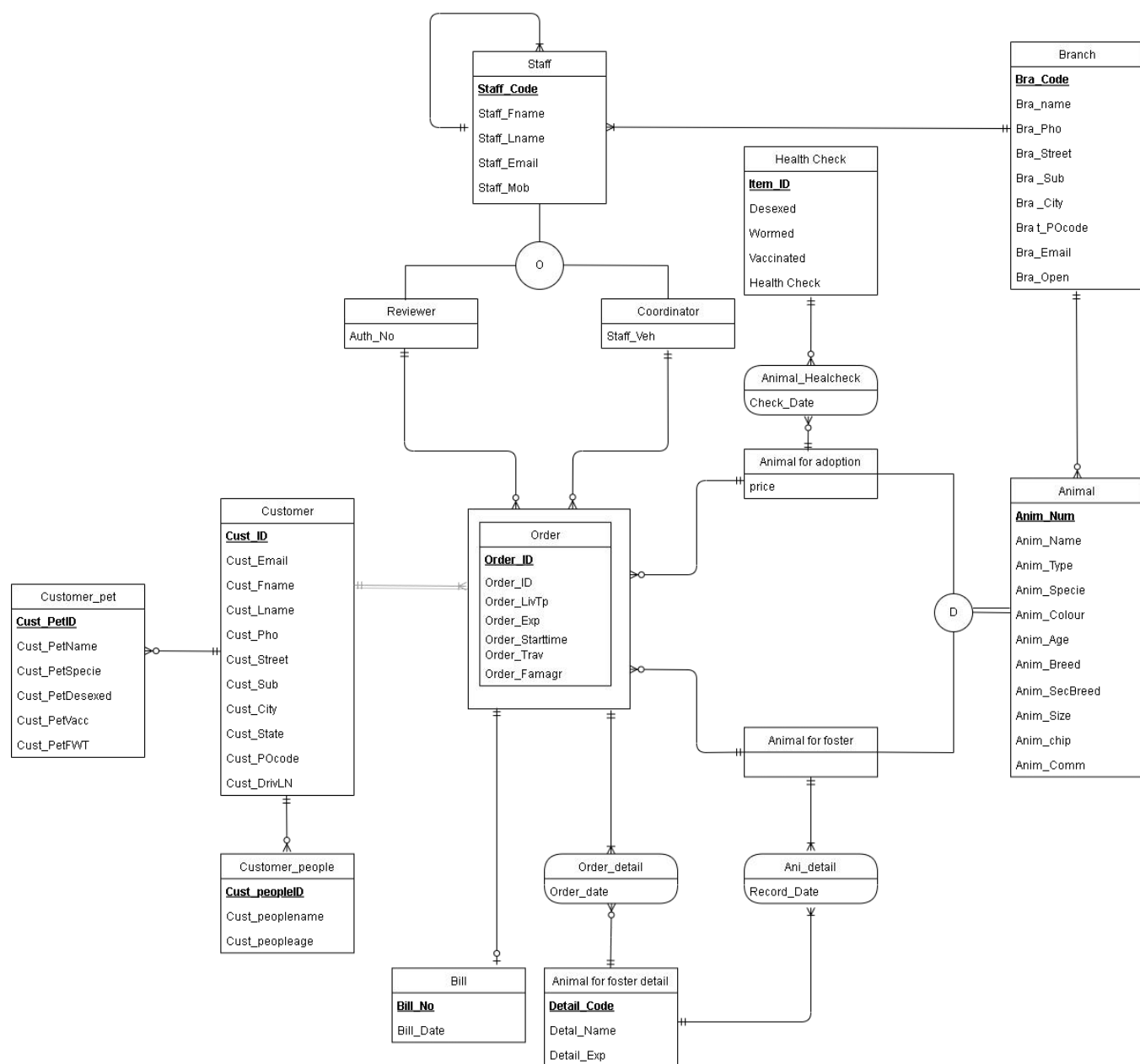
- 1、 The system generates each customer a unique number.
- 2、 Customers have to provide personal information
- 3、 Customers must provide information about their current pet(s) and the people living with them. Customers have to provide all their pets and co-living information. Every pet and person is given a unique ID.
- 4、 Every customer can place many orders, and each must place at least one. Every order is given a unique number. Customer must provide their living type, the experience of having pets, start time, and family agreement.
- 5、 Each order can apply to only one Animal.
- 6、 The customer must select at least one detailed option about the foster animals to match the appropriate foster animals.
- 7、 Each Animal has a unique number for identity and is located in a branch. System provides information for each Animal according to website.
- 8、 Each branch has a unique branch id and contains branch information.
- 9、 All the animals must be put into the foster or adoption group, and an animal can only be fostered or adopted.
- 10、 Each Animal for adoption should provide a health check record. Health checks include desexed check, vaccination, health check and dog wormed check. Different animals apply to the different check(s) for neccerey
- 11、 Each Animal for foster has to be recorded in at least one or many details.
- 12、 The system generates a bill for each order for adoption that is approved. Each bill has a unique bill number.
- 13、 Each staff has a unique staff code. Every staff has a manager as a supervisor, and a manager supervises at least one employee. Every staff must be located in a branch
- 14、 Some employees are authorized to be reviewers or coordinators. Staff can be reviewers and coordinators.
- 15、 Each reviewer has an authorization number for login into the system. Each coordinator has a vehicle for on-site inspection. Once an

application is approved, the coordinator is in charge of helping with animal delivery.

- 16、 Every application will be reviewed by one staff(reviewer). Each reviewer can review many or no orders, and each coordinator can handle many inspection cases.
- 17、 Each staff and Animal have to be located in one branch. Each branch has at least one staff, and each branch may have animals.

B.3. ERD

31271 Database Fundamentals
ERD Book Notation Template



B.4. Justifications of the ERD based on the business rules and/or assumptions.

BRs related to entity Customer:

1	The system generates each customer a unique number.
2	Customers have to provide personal information.

The PK of the Customer is Customer ID

BRs related to the relationship between Customers and Customer_pet:

3	Customers must provide information about their current pet(s) and the people living with them. Customers have to provide all their pets and co-living information. Every pet and person is given a unique ID.	cardinality one to many
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The Pk of the Customer_pet is Cust_PetID**The FK of the Customer_pet is Cust_ID** from Customer**Customer to Customer_pet:** optional one to many**Customer_Pet to Customer:** mandatory one to one

BRs related to the relationship between Customers and Customer_people:

3	Customers must provide information about their current pet(s) and the people living with them. Customers have to provide all their pets and co-living information. Every pet and person is given a unique ID.	cardinality one to many
---	---	-------------------------

The Pk of the Customer_people is Cust_peopleID**The FK of the Customer_people is Cust_ID** from Customer**Customer to Customer_people:** optional one to many

Customer_people to Customer: mandatory one to one

BRs related to the relationship between Customers and Order:

4	Every customer can place many orders, and each must place at least one. Every order is given a unique number.	Cardinality one to many
---	---	-------------------------

The Pk of the Order(weak entity) is: Order ID Cust ID

The Fk of the Order is: Cust_ID from Customer

Customer to Order: mandatory one to many

Order to Customer: mandatory one to one

BRs related to entity Animal

7	Each Animal has a unique number for identity and is located in a branch. The system provides information for each Animal according to the website.
---	--

The PK of the Animal is: Anim Num

BRs related to entity Branch

8	Each branch has a unique branch id and contains branch information.
---	---

The PK of the Branch is: Branch code

BRs related the relationship between Animal and Branch:

7	Each Animal has a unique number for identity and is located in a branch. The system provides information for each Animal according to the website.	Cardinality one to many
17	Each staff and Animal have to be located in one branch. Each branch has at least one staff, and each branch may have animals.	Cardinality one to many

The PK of the Animal is: Anim Num

The FK of the Animal is: Branch_code from Branch

Animal to Branch: mandatory one to one

Branch to Animal: optional one to many

BRs related the relationship between Animal, animal for adoption and animal for foster.

9	All the animals must be put into the foster or adoption group, and an animal can only be fostered or adopted.	Apply total specialization rule, disjoin constraint
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Animal for adoption and Animal for foster are subtypes of Animal.

The FK of the Animal for foster is: Anim_Num

The PK of the Animal for foster is: Anim_Num from Animal

The FK of the Animal for adoption is: Anim_Num

The PK of the Animal for adoption is: Anim_Num from Animal

BRs related the relationship between Animal for adoption and Health Check.

10	Each Animal for adoption should provide a health check record. Health checks include desexed check, vaccination, health check and dog wormed check. Different animals apply to the different check(s) for neccerey.	cardinality many to many
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Assumption: the system has to record the health check date.

So, create an associate entity: Animal_Healthcheck

The PK of Animal_Healthcheck is: Anim_Num, Item_ID

The FK of Animal Healthcheck is: Anim_Num from Animal for adoption

Item_ID from Health check

Health check to Animal health check is: optional one to many

Animal health check to Health check is mandatory one to one

Animal health check to Animal for adoption: mandatory one to one

Animal for adoption to Animal health check: optional one to many

BRs related the relationship between Animal for foster and Ani_detail

11	Each Animal for foster has to be recorded in at least one or many details.	cardinality many to many
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Assumption: the system has to record the details record date.

So, create an associate entity: Ani_detail

The PK of the Ani_detail is: Anim_Num, Detail_code

The FK of the Ani_detail is: Anim_Num from Animal for foster

Detail_code from Animal for foster detail

Animal for foster detail to Ani_detail: mandatory one to many

Ani_detail to Animal for foster detail: mandatory one to one

Animal for foster to Ani_detail: mandatory one to many

Ani_detail to Animal for foster: mandatory one to one

BRs related the entity Animal for foster detail:

6	The customer must select at least one detailed option about the foster animals to match the appropriate foster animals.	
11	Each Animal for foster has to be recorded in at least one or many details.	

The PK of the entity Animal for foster detail is: Detail_code

BRs related the relationship between Animal for foster detail and Order

6	The customer must select at least one detailed option about the foster animals to match the appropriate foster animals.	cardinality many to many
---	---	--------------------------

Assumption: the system has to record the date of selecting details.

So, create an associate entity: Order_detail

The PK of the Order_detail is: Detail_code, Order_ID, Cust_ID

The FK of the Order_detail is: Detail_code from Animal for foster detail

Order_ID from Order

Cust_ID from Order

Order to Order_detail: mandatory one to many

Order_detail to Order: mandatory one to one

Animal for foster detail to Order_detail: optional one to many

Order_detail to Animal for foster detail: mandatory one to one

BRs related the entity Bill

12	The system generates a bill for each order for adoption that is approved. Each bill has a unique bill number.
----	---

The PK of Bill is **Bill No**

BRs related the relationship between Order and Bill

12	The system generates a bill for each order for adoption that is approved. Each bill has a unique bill number.	cardinality one to one
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The PK of Bill is **Bill No**

The FK of the Bill is Orde_ID from Order

Cust_ID from Order

Order to Bill: optional one to one

Bill to Order: mandatory one to one

BRs related the relationships between Order and Animal(Animal for adoption and Animal for foster)

5	Each order must apply to only one Animal.	cardinality one to one
---	---	------------------------

The PK of the Order is **Cust ID, Order ID**

The FK of the Order is Cust_ID from Customer

Anim_Num from Animal for adoption or Animal for foster

Order to Animal for adoption: mandatory one to one

Order to Animal for foster: mandatory one to one

Animal for adoption to Order: optional oneto many

Animal for foster to Order: optional one to many

BRs related the entity Staff and self-relationship of Staff

13	Each staff has a unique staff code. Every staff has a manager as a supervisor, and a manager supervises at least one employee.	cardinality one to many
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The PK of the Staff is Staff Code.

The FK of the Staff is Staff_Code (Manger_ID) from Staff

Staff to Staff(Manager) is mandatory one to one

Staff(Manager) to Staff is mandatory one to many

BRs related the relationship between Staff and Branch.

17	Each staff and Animal have to be located in one branch. Each branch has at least one staff, and each branch may have animals.	cardinality one to many
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The PK of the Staff is: Staff Code

The Fk of the Staff is: Bra_Code from Branch

Staff to Branch: mandatory one to one

Branch to Staff: mandatory one to many

BRs related the relationship of the Staff, Reviewer and Coordinator

14	Some employees are authorized to be reviewers or coordinators. Staff can be reviewers and coordinators.	Apply partial specialization rule, overlapping constraint
15	Each reviewer has an authorization number for login into the system. Each coordinator has a vehicle for on-site inspection. Once an application is approved, the coordinator is in charge of helping with animal delivery.	

The PK of the Reviewer is Staff Code

The PK of the Coordinator is Staff Code

The FK of the Reviewer is Staff_Code from Staff

The FK of the Coordinator is Staff_Code from Staff

BRs related the relationships between Order and Staff(Reviewer, Coordinator)

16	Every application will be reviewed by one staff(reviewer). Each reviewer can review many or no orders, and each coordinator can handle many inspection cases.	cardinality one to many cardinality one to many
----	---	--

The PK of Order is: Order_ID, Cust_ID

The FK of Order is: Cust_ID from Customer

Staff_ID from Reviewer

Satff_ID from Coordinator

Order to Reviewer: mandatory one to one

Order to Coordinator: mandatory one to one

Reviewer to Order: optional one to many

Coordinator to order: optional one to many

Database Design Assignment Part C

C. 1. Revised Business rules and assumptions (From part B)

Assumptions

According to the website's requirements, each applicant must communicate with the staff by telephone before filling in the application form through the website,

so it is assumed that the formal process starts from filling in the application form. There is no need for data and operation before filling in the application.

Only the reviewer and the coordinator are involved in the application process. According to business, every staff has a manager. A manager can manage many staffs or no staff. Every staff are supervised by only one manager.

The website uses different application forms (more than three). It is assumed that the system has the identification function and can classify and store the information of different application forms in different modules and automatically generate the information required by the reviewer and coordinator.

The system has to record the health check date.

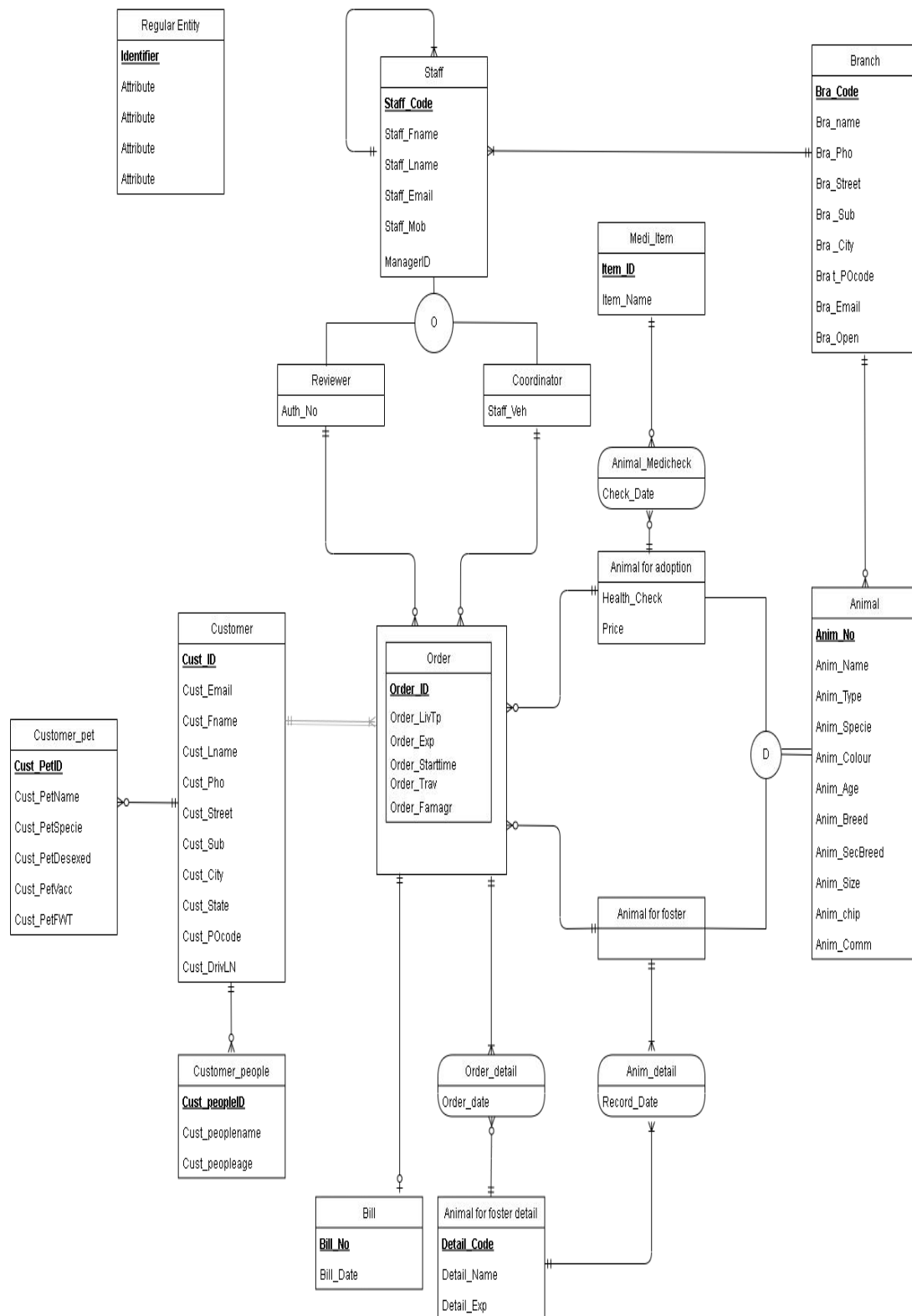
The system has to record the date of order.

Business rules:

- 1、 The system generates each customer a unique number.
- 2、 Customers must provide personal information, including email address, full name, phone number, address, Drive license.
- 3、 Customers must provide information about their current pet(s) and the people living with them. Customers have to provide all their pets and co-living information as required. Every pet and person is given a unique ID. Customer must provide their pet's name, specie, desexed, vaccine and wormed. Customer must provide the name and ages of people who live with them.
- 4、 Every customer can place many orders, and each must place at least one. The system gives every order a unique number.
- 5、 Each order can apply to only one Animal.
- 6、 The customer must select at least one detailed option about the foster animals to match the appropriate foster animals. The system needs to store the order data.
- 7、 Each Animal has a unique number for identity and is located in a branch. System provides information for each Animal according to the website. Such as name, type, specie, colour, age, breed, second breed, size, chip number, and comment.
- 8、 Each branch has a unique branch id and contains branch information for customers, including branch name, shop address, email address and open time.
- 9、 All the animals must be put into the foster or adoption group, and an animal can only be fostered or adopted. Each Animal for adoption must provide a health check and price, and each Animal for foster must provide details.

- 10、 Each Animal for adoption should provide a Medi_ record. The Medi_ record may includes desexed check, vaccination, animal heart wormed record. Different animals apply to the different item(s) for neccerey. The system record the record date.
- 11、 Each Animal for foster has to be recorded in at least one or many details, and every detail includes a detail name and explanation. An animal can have many details, and each Animal must be recorded at least one detail.
- 12、 The system generates a bill for each order for adoption that is approved. Each bill has a unique bill number, and the system record the date bill is issued.
- 13、 Each staff has a unique staff code. Every staff has a manager as a supervisor, and a manager supervises at least one employee. Every staff must be located in a branch
- 14、 Some employees are authorized to be reviewers or coordinators. Staff can be reviewers and coordinators.
- 15、 Each reviewer has an authorization number for login into the system. Each coordinator has a vehicle for on-site inspection. Once an application is approved, the coordinator is in charge of helping with animal delivery.
- 16、 Every application will be reviewed by one staff(reviewer). Each reviewer can review many or no orders, and each coordinator can handle many inspection cases.
- 17、 Each staff and Animal have to be located in one branch. Each branch has at least one staff, and each branch may have animals.

C. 2. Revised ERD of Part B



C. 3. Relations

Customer(**Cust_ID**, Cust_Email, Cust_Fname, Cust_Lname, Cust_Pho, Cust_Street, Cust_Sub, Cust_City, Cust_State, Cust_Pocode, Cust_DivLN)

PK **Cust_ID**

Customer_pet(**Cust_PetID**, Cust_PetName, Cust_PetSpecie, Cust_PetDesexed, Cust_PetVacc, Cust_PetFWT, Cust_ID*)

PK **Cust_PetID**

FK Cust_PetID* References Customer

Customer_people(**Cust_peopleID**, Cust_peoplename, Cust_peopleage, Cust_ID*)

PK **Cust_peopleID**

FK Cust_PetID* References Customer

Branch(**Bra_Code**, Bra_Name, Bra_Pho, Bra_Street, Bra_Sub, Bra_City, Bra_Pocode, Bra_Email, Bra_Open)

PK **Bra_Code**

Animal(**Anim_No**, Anim_Name, Anim_Type, Anim_Specie, Anim_Colour, Anim_Age, Anim_Breed, Anim_SecBreed, Anim_Size, Anim_Chip, Anim_Comm, Bra_Code*)

PK **Anim_No**

FK Bra_Code* References Branch

Animal for adoption(**Anim_No*** Price Healthc_check)

PK **Anim_No**

FK Anim_No* References Animal

Medi_record (**Item_ID**, Item_Name)

PK **Item_ID**

Animal_medirecord ((**Anim_No***, **Item_ID*** Check_Date)

PK **Anim_No**, **Item_ID**

FK Anim_No References Animal for adoption

FK Item_ID References Medi_record

Animal for foster(**Anim_No***)

PK **Anim_No**

FK Anim_No* References Animal

Animal for foster detail(**Detail_code**, Detail_Name, Detail_Exp)

PK **Detail_code**

Anim_Detail(**Anim_No***, **Detail_code***, Record_Date)

PK Anim_No, Detail_code
 FK Anim_No References Animal for foster
 FK Detail_code References Animal for foster detail()

Staff(**Staff_code**, Staff_Fname, Staff_Lname, Staff_Email, Staff_Mob, ManagerID*, Bra_Code*)
 PK Staff_code
 FK Bra_Code* References Branch
 FK ManagerID* References Staff (Staff_code)

Reviewer(**Staff_code***, Auth_No)
 PK Staff_code
 FK Staff_code References Staff

Coordinator(**Staff_code***, Staff_Veh)
 PK Staff_code
 FK Staff_code References Staff

Order(**Cust_ID***, **Order_ID**, Order_Livtp, Order_Exp, Order_Starttime, Order_Trav, Order_Famgr, Staff_code_Coordinator *, Staff_code_Reviewer *, Anim_No *)
 PK Cust_ID, Order_ID
 FK Cust_ID Reference Customer
 FK Staff_code_Coordinator Reference Coordinator(Staff_code)
 FK Staff_code_Reviewer Reference Reviewer(Staff_code)
 FK Anim_No Reference Animal (Anim_No)

Order_detail(**Cust_ID***, **Order_ID*** **Detail_code***, Order_date)
 PK Cust_ID*, Order_ID* Detail_code*
 FK Cust_ID Reference Order
 FK Order_ID Reference Order
 FK Detail_code Reference Animal for foster detail

Bill(**Bill_No**, Bill_Date, Cust_ID*, Order_ID*)
 FK Cust_ID Reference Order
 FK Order_ID Reference Order

C. 4. List of Functional Dependencies Related to Each Business Rules.

1	The system generates each customer a unique number.
2	Customers must provide personal information, including email address, full name, phone number, address, Drive license.

The following FD is determined based on BR1, BR2,

FD1: Cust_ID → Cust_Email, Cust_Fname, Cust_Lname, Cust_Pho, Cust_Street, Cust_Sub, Cust_City, Cust_State, Cust_Pocode, Cust_DivLN

3	Customers must provide information about their current pet(s) and the people living with them. Customers have to provide all their pets and co-living information as required. Every pet and person is given a unique ID. Customer must provide their pet's name, specie, desexed, vaccine and wormed. Customer must provide the name and ages of people who live with them.
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The following FD is determined based on BR3

FD2: Cust_PentID → Cust_PetName, Cust_PetSpecie, Cust_PetDesexed, Cust_PetVacc, Cust_PetFWT

FD3: Cust_peopleID → Cust_peoplename, Cust_peopleage

4	Every customer can place many orders, and each must place at least one. The system gives every order a unique number. Customer must provide their living type, the experience of having pets, start time, and family agreement.
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Strong entity to weak entity.

The following FD is determined based on BR4

FD4: Cust_ID, Order_ID → Order_Livtp, Order_Exp, Order_Starttime, Order_Trav, Order_Famgr

5	Each order can apply to only one Animal.
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Order to Animal : mandatory 1 to 1

Animal to Order: optional 1 to many

6	The customer must select at least one detailed option about the
---	---

	foster animals to match the appropriate foster animals. The system needs to store the order data.
--	---

Order to Animal for foster detail: mandatory 1 to many

Animal for foster detail to Order: optional 1 to many

It's many to many relationships, so create an associate entity

"Order_detail."

FD5 Detail_Code → Detail_Name, Detail_Exp

FD6 Cust_ID, Order_ID, Detail_Code → Order_Date

7	Each Animal has a unique number for identity and is located in a branch. System provides information for each Animal according to the website. Such as name, type, specie, colour, age, breed, second breed, size, chip number, and comment.
9	All the animals must be put into the foster or adoption group, and an animal can only be fostered or adopted. Each Animal for adoption must provide a health check and price, and each Animal for foster must provide details.

Animal is supertype, Animal for adoption and Animal for foster are subtype.

Animal

FD7

Animal_No → Animal_Name, Animal_Type, Animal_Specie, Animal_Colour, Animal_Age, Animal_Breed, Animal_SecBreed, Animal_Size, Animal_chip, Animal_Comm.

Animal for adoption

FD8

Animal_No → Price, Health_Check

10	Each Animal for adoption should provide a Medi_record. The Medi_record may includes desexed check, vaccination, animal heart wormed record. Different animals apply to the different item(s) for neccerey. The system record the record date.
----	---

HealthCheck to Animal for adoption: optional 1 to many

Animal for adoption to HealthCheck: optional 1 to many

It is many to many relationships, so create 'Animal_Heaithcheck' entity.

FD9

Item_ID → Item_Name

FD10**Item_ID, Animal_No → Check_Date**

11	Each Animal for foster has to be recorded in at least one or many details, and every detail includes a detail name and explanation. An animal can have many details, and each Animal must be recorded at least one detail.
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Animal for foster detail to Animal for foster : mandatory 1 to many

Animal for foster to Animal for foster detail: mandatory 1 to many

It is many to many relationships, so create Anim_detail entity.

FD11**Anim_No, Detail_Code → Record_Date**

12	The system generates a bill for each order for adoption that is approved. Each bill has a unique bill number, and the system record the date bill is issued.
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FD12**Bill_No → Bill_Date**

13	Each staff has a unique staff code. Every staff has a manager as a supervisor, and a manager supervises at least one employee. Every staff must be located in a branch. The system records staffs information as name, email address, mobile number, manager ID.
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FD13**Staff_Code → Staff_Fname, Staff_Lname, Staff_Email, Staff_Mob, ManagerID**

13	Some employees are authorized to be reviewers or coordinators. Staff can be reviewers and coordinators.
14	Each reviewer has an authorization number for login into the system. Each coordinator has a vehicle for on-site inspection. Once an application is approved, the coordinator is in charge of helping with animal delivery.

FD14**Staff_Code → Auth_No****FD15****Staff_Code → Staff_Veh**

8	Each branch has a unique branch id and contains branch information for customers, including branch name, shop address, email address and open time.
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FD16

Bra_Code → Bra_Name, Bra_Pho, Bra_Street, Bra_Sub, Bra_City, Bra_Pocode, Bra_Email, Bra_Open.

C. 5. Normalization

FD1: Cust_ID → Cust_Email, Cust_Fname, Cust_Lname, Cust_Pho, Cust_Street, Cust_Sub, Cust_City, Cust_State, Cust_Pocode, Cust_DivLN

FD2: Cust_PentID → Cust_PetName, Cust_PetSpecie, Cust_PetDesexed, Cust_PetVacc, Cust_PetFWT

FD3: Cust_peopleID → Cust_peoplename, Cust_peopleage

FD4: Cust_ID, Order_ID → Order_Livtp, Order_Exp, Order_Starttime, Order_Trav, Order_Famgr

FD5 Detail_Code → Detail_Name, Detail_Exp

FD6 Cust_ID, Order_ID, Detail_Code → Order_Date

FD7 Animal_No → Animal_Name, Animal_Type, Animal_Specie, Animal_Colour, Animal_Age, Animal_Breed, Animal_SecBreed, Animal_Size, Animal_chip, Animal_Comm

FD8 Animal_No → Price, Health_Check

FD9 Item_ID → Item_Name

FD10 Item_ID, Animal_No → Check_Date

FD11 Anim_No, Detail_Code → Record_Date

FD12 Bill_No → Bill_Date

FD13 Staff_Code → Staff_Fname, Staff_Lname, Staff_Email, Staff_Mob, ManagerID

FD14 Staff_Code → Auth_No

FD15 Staff_Code → Staff_Veh

FD16 Bra_Code → Bra_Name, Bra_Pho, Bra_Street, Bra_Sub,
Bra_City, Bra_Pocode, Bra_Email, Bra_Open.

1- First normal form (1NF)

First definition:

All attributes are atomic: Every attribute is atomic.

There is no derived attribute: All attributes are original, not calculated data.

Second definition:

There is no repeating group in the relation: Checked.

2- Second normal form (2NF):

There is no partial dependency. The Keys determine all non-key attributes

3- Third normal form (3NF):

All non-key attributes are not determined by other non_key attributes.

Customer(Cust_ID, Cust_Email, Cust_Fname, Cust_Lname, Cust_Pho, Cust_Street,
Cust_Sub, Cust_City, Cust_State, Cust_Pocode, Cust_DivLN)

PK Cust_ID

FD1 Cust_ID → Cust_Email, Cust_Fname, Cust_Lname, Cust_Pho, Cust_Street,
Cust_Sub, Cust_City, Cust_State, Cust_Pocode, Cust_DivLN

Customer_pet(Cust_PetID, Cust_PetName, Cust_PetSpecie, Cust_PetDesexed,
Cust_PetVacc, Cust_PetFWT, Cust_ID*)

PK Cust_PetID

FK Cust_PentID* References Customer

FD2 Cust_PentID → Cust_PetName, Cust_PetSpecie, Cust_PetDesexed,
Cust_PetVacc, Cust_PetFWT

Customer_people(Cust_peopleID, Cust_peoplename, Cust_peopleage, Cust_ID*)

PK Cust_peopleID

FK Cust_PentID* References Customer

FD3 Cust_peopleID→Cust_peoplename, Cust_peopleage

Branch(**Bra_Code**, Bra_Name, Bra_Photo, Bra_Street, Bra_Sub, Bra_City,
Bra_Pocode, Bra_Email, Bra_Open)

PK Bra_Code

FD16 Bra_Code →Bra_Name, Bra_Photo, Bra_Street, Bra_Sub,
Bra_City, Bra_Pocode, Bra_Email, Bra_Open.

Animal(**Anim_No**, Anim_Name, Anim_Type, Anim_Specie, Anim_Colour,
Anim_Age, Anim_Breed, Anim_SecBreed, Anim_Size, Anim_Chip, Anim_Comm,
Bra_Code*)

PK Anim_No

FK Bra_Code* References Branch

FD7 Animal_No →Animal_Name, Animal_Type, Animal_Specie, Animal_Colour,
Animal_Age, Animal_Breed, Animal_SecBreed, Animal_Size, Animal_chip,
Animal_Comm

Animal for adoption(**Anim_No***, Price, Healthc_check)

PK Anim_No

FK Anim_No* References Animal

FD8 Animal_No→Price, Health_Check

Medi_record (**Item_ID**, Item_Name)

PK Item_ID

FD9 Item_ID → Item_Name

Animal_medirecord ((**Anim_No***, **Item_ID*** Check_Date)

PK Anim_No, Item_ID

FK Anim_No References Animal for adoption

FK Item_ID References Medi_record

FD10 Item_ID, Animal_No→Check_Date

Animal for foster detail(**Detail_code**, Detail_Name, Detail_Exp)

PK Detail_code

FD5 Detail_Code→Detail_Name, Detail_Exp

Anim_Detail(**Anim_No***, **Detail_code***, Record_Date)

PK Anim_No, Detail_code

FK Anim_No References Animal for foster

FK Detail_code References Animal for foster detail()

FD11 Anim_No, Detail_Code →Record_Date

Staff(**Staff_code**, Staff_Fname, Staff_Lname, Staff_Email, Staff_Mob, ManagerID*, Bra_Code*)

PK Staff_code

FK Bra_Code* References Branch

FK ManagerID* References Staff (Staff_code)

FD13 Staff_Code → Staff_Fname, Staff_Lname, Staff_Email, Staff_Mob, ManagerID

Reviewer(**Staff_code***, Auth_No)

PK Staff_code

FK Staff_code References Staff

FD14 Staff_Code → Auth_No

Coordinator(**Staff_code***, Staff_Veh)

PK Staff_code

FK Staff_code References Staff

FD15 Staff_Code → Staff_Veh

Order(**Cust_ID***, **Order_ID**, Order_Livtp, Order_Exp, Order_Starttime, Order_Trav, Order_Famgr, Staff_code_Coordinator *, Staff_code_Reviewer *, Anim_No *)

PK Cust_ID, Order_ID

FK Cust_ID Reference Customer

FK Staff_code_Coordinator Reference Coordinator(Staff_code)

FK Staff_code_Reviewer Reference Reviewer(Staff_code)

FK Anim_No Reference Animal (Anim_No)

FD4 Cust_ID, Order_ID → Order_Livtp, Order_Exp, Order_Starttime, Order_Trav, Order_Famgr

Order_detail(**Cust_ID***, **Order_ID***, **Detail_code***, Order_date)

PK Cust_ID*, Order_ID* Detail_code*

FK **Cust_ID** Reference Order

FK **Order_ID** Reference Order

FK **Detail_code** Reference Animal for foster detail

FD6 Cust_ID, Order_ID, Detail_Code → Order_Date

FD12 Bill(**Bill_No**, Bill_Date, Cust_ID*, Order_ID*)

FK Cust_ID Reference Order

FK Order_ID Reference Order

FD12 Bill_No → Bill_Date

Database Design Assignment Part D

Notes:

- Please submit Part D as a separate **.txt or .sql file** on both Canvas and Ed (in Part D module).
- **DO NOT** submit a Microsoft word document. The only accepted file extension is txt, or sql.
- Please review the instruction and watch the uploaded video on Ed (in Part D module).
- Please see the provided example file "dbpizza_Revised.txt", or in the assignment sample:

D.1. Created Database

1. You should download the dbName.sql file as follows and **submit it in .txt or .sql format on both Canvas and Ed.**

