

Carleton University

cuACS

Deliverable 1

Team QuackJaws

Jake Bauer
Ashlee Foureyes
Skyler Gubbels
Will Watt

Submitted to:
Dr. Christine Laurendeau
COMP3004 – Object-Oriented Software Engineering
School of Computer Science
Carleton University

February 12, 2019

Contents

Carleton University.....	1
Contents.....	2
1. Introduction.....	2
1.1 Purpose of cuACS.....	2
1.2 Document Overview.....	3
2. Proposed System.....	3
2.1 Overview.....	3
2.2 Function Requirements.....	3
2.3 Non-Functional Requirements.....	3
2.4 System Models.....	3
2.4.1 Use Case Model.....	3
3. Object Model.....	15
3.1 Data Dictionary.....	15
3.2 Class Diagrams.....	15
Table of Figures.....	15
Table of Terms Used.....	15

1. Introduction

1.1 Purpose of cuACS

Animal shelters are tasked with the responsibility to provide care to animals in need while they await adoption into a loving home. Humans that are seeking the companionship of a pet can visit a shelter and choose an animal to adopt. However, with this process an issue often arises where a pet is adopted by a human whom they are not fully compatible with. This mismatch can be due to a variety of reasons, including temperament, conflicting lifestyle requirements, and physical and non-physical needs of both the pet and the potential adopter.

Carleton University Animal Care System (cuACS) aims to alleviate the issue of mismatching by providing a tool that automatically matches a pet to a potential owner based on compatibility. This compatibility measurement is based on numerous physical and non-physical traits, as specified by the potential owner. cuACS enables a smooth adoption process and ensures the experience will prove positive and match an animal that fulfills a clients expectations and suits their lifestyle.

1.2 Document Overview

This document will outline and describe the functional and non-functional requirements of cuACS. The functional requirements will describe the interactions between the system and its environment independent of its implementation. The non-functional requirements describe the components of the system that are not directly related to its functional behaviour. This document will also present an in-depth look into the functional requirements by providing a use case model.

2. Proposed System

2.1 Overview

2.2 Functional Requirements

2.3 Non-Functional Requirements

2.4 System Models

2.4.1 Use Case Model

High Level Use Case Descriptions

UC-01	Run Matching Algorithm	StaffMembers launch an instance of the animal-client matching algorithm and view its output.
UC-02	Manage Animal Profiles	StaffMembers view, add, and alter animal profiles.
UC-03	View All Animal Profiles	StaffMembers and Clients view a list of all animals which are registered in the shelter. They also view detailed profiles of selected animals.
UC-04	Manage Client Profiles	StaffMembers manage the profiles of Clients including adding new profiles and editing existing ones.
UC-05	Manage Own Profile	Clients manage their own profile, adding and removing information as desired.

High Level Use Case Breakdowns

Use Case Identifier	UC-01
Use Case Name	Run Matching Algorithm
Participating Actor(s)	StaffMember
Flow of Events	<ol style="list-style-type: none"> 1. The StaffMember launches an instance of the ACM algorithm to match Clients and animals. 2. The StaffMember views a basic list of the matches resulting from running the algorithm. 3. The StaffMember chooses a desired match to view detailed information explaining why the match was made by the algorithm.
Entry Condition(s)	<ul style="list-style-type: none"> • The StaffMember is logged into cuACS.
Exit Condition(s)	<ul style="list-style-type: none"> • The matches are available to be seen by StaffMembers upon completion of a running instance of the algorithm OR • There is a MissingProfilesError which causes the operation to abort.
Quality Requirement(s)	<ul style="list-style-type: none"> • While the algorithm is being run, a progress bar should appear showing the progress of matching. • A running instance of the algorithm should happen in the background and should not lock up the program.
Traceability	FR-3.0.0, FR-3.1.0, FR-3.2.0, FR-3.4.0, NFR-3

Use Case Identifier	UC-02
Use Case Name	Manage Animal Profiles

Participating Actor(s)	StaffMember
Flow of Events	<ol style="list-style-type: none"> 1. StaffMember chooses whether or not to add or alter an existing animal profile 2. If the StaffMember chooses to add a new animal profile, they fill out the animal's information 3. If the StaffMember chooses to alter an existing animal's profile, they view the animal's profile and edit the fields they wish to change. 4. Both choices result in the StaffMember saving the new or altered animal profile to persistent storage.
Entry Condition(s)	<ul style="list-style-type: none"> • The StaffMember is logged into cuACS.
Exit Condition(s)	<ul style="list-style-type: none"> • The new or altered animal profile is saved to persistent storage OR • The system presents the StaffMember with a FileError, aborting the process and restoring the pre-change state of the system.
Quality Requirement(s)	-
Traceability	FR-1.1.0, FR-1.2.0, FR-1.3.0, NFR-5

Use Case Identifier	UC-03
Use Case Name	View All Animal Profiles
Participating Actor(s)	Initiated by StaffMember OR Initiated by Client
Flow of Events	<ol style="list-style-type: none"> 1. StaffMember or Client chooses to view all of the animal profiles by accessing the relevant part of the user interface. 2. The StaffMember or Client select a specific animal to view more detailed information about that animal.
Entry Condition(s)	<ul style="list-style-type: none"> • The StaffMember, or Client, is logged into cuACS.
Exit Condition(s)	<ul style="list-style-type: none"> • The profile is displayed to the initiator OR • The system presents the initiator with a FileError, aborting the process
Quality Requirement(s)	-
Traceability	FR-1.2.0, FR-1.2.1, FR-1.2.2, FR-1.2.3, NFR-5

Use Case Identifier	UC-04
Use Case Name	Manage Client Profiles
Participating Actor(s)	Initiated by StaffMember Communicates with Client

Flow of Events	<ol style="list-style-type: none"> 1. A StaffMember views the list of all clients. 2. A StaffMember chooses to add or edit an existing Client profile. 3. If the staff member chooses to add a Client profile, they create one and fill out all of the basic information necessary for the profile to be created. 4. If the StaffMember chooses to edit a Client's profile, they choose the specific Client's profile. 5. Then the StaffMember edits the fields that need to be changed. 6. Finally, for both choices, the Client profile is saved to persistent storage. 7. The Client can now view and edit their new or altered profile.
Entry Condition(s)	<ul style="list-style-type: none"> • The StaffMember is logged into cuACS.
Exit Condition(s)	<ul style="list-style-type: none"> • The new or altered Client profile is saved to persistent storage.
Quality Requirement(s)	<ul style="list-style-type: none"> • A Client's profile data should be stored securely to comply with local privacy laws.
Traceability	FR-2.0.0, FR-FR-2.1.0, FR-2.2.0, FR-2.2.1, FR-2.3.0, NFR-30

Use Case Identifier	UC-05
Use Case Name	Manage Own Profile
Participating Actor(s)	Initiated by Client
Flow of Events	<ol style="list-style-type: none"> 1. A Client sees their own profile 2. The Client makes a change to one or more fields in their profile information. 3. The Client saves their updated profile to persistent storage.
Entry Condition(s)	<ul style="list-style-type: none"> • The Client is logged in to their cuACS account.
Exit Condition(s)	<ul style="list-style-type: none"> • The Client's updated profile is saved to persistent storage.
Quality Requirement(s)	<ul style="list-style-type: none"> • A Client's profile data should be stored securely to comply with local privacy laws.
Traceability	FR-2.3.1, FR-2.3.2, NFR-30

Detailed Use Case Descriptions

UC-06	LaunchMatchingAlgorithm	StaffMembers launch an instance of the animal Client matching algorithm which runs in the background.
UC-07	ViewListOfMatches	StaffMembers see a list of matched Clients and animals output by the algorithm.

UC-08	ViewDetailedMatchInformation	StaffMembers select one match from the list and view the detailed output about why the match was made by the algorithm.
UC-09	AddAnimalProfile	A StaffMember adds a new animal profile, filling out all necessary information.
UC-10	EditAnimalProfile	A StaffMember edits an animal's profile, changing one or more fields.
UC-11	AddClientProfile	A StaffMember adds a new client profile, filling out all the necessary information.
UC-12	EditClientProfile	A StaffMember edits an existing client's profile
UC-13	ViewAllAnimalProfiles	A StaffMember OR a Client view a list of all the animals registered in the system.
UC-14	ViewDetailedAnimalProfile	A StaffMember OR a Client view detailed ithe detailed profile of a selected animal.
UC-15	ViewAllClientProfiles	A StaffMember views a list of all the clients registered in the system.
UC-16	ViewDetailedClientProfile	A StaffMember views detailed information about a selected client.
UC-17	ViewOwnProfile	A Client views their own complete profile.
UC-18	EditOwnProfile	A Client makes desired modifications to the fiels that make up their profile.
UC-19	MissingProfilesError	The system reports that insufficient profiles are available to run the matching algorithm.
UC-20	SaveFile	The system saves a profile file to persistent storage.
UC-21	FileError	There was an error processing a selected profile file (generalizes FileOpenError, FileFormatError, FileInputError, FileOutputError). The error is reported to the user and the operation is aborted.
UC-22	FileFormatError	The system reports that the file contains a corrupted or incomplete data format.
UC-23	FileInputError	The system reports that the file could not be read.
UC-24	FileOutputError	The system reports that the file could not be written to.
UC-25	FileOpenError	The system reports that the file could not be opened.

Use Case Identifier	UC-06
Use Case Name	LaunchMatchingAlgorithm
Participating Actor(s)	Initiated by StaffMember
Flow of Events	1. A StaffMember launches an instance of the matching algorithm.
Entry Condition(s)	<ul style="list-style-type: none"> The StaffMember must be logged in to cuACS.
Exit Condition(s)	<ul style="list-style-type: none"> The algorithm finishes running OR The algorithm throws a MissingProfilesError
Quality Requirement(s)	<ul style="list-style-type: none"> The algorithm may not lock the system while it is running.
Traceability	FR-3.0.0, NFR-3

Use Case Identifier	UC-07
Use Case Name	ViewListOfMatches
Participating Actor(s)	Initiated by StaffMember
Flow of Events	1. A StaffMember chooses the option to view a list of all the matches made by running the latest instance of the matching algorithm.
Entry Condition(s)	<ul style="list-style-type: none"> An instance of the algorithm must have been run.
Exit Condition(s)	<ul style="list-style-type: none"> The list of matches is shown to the StaffMember
Quality Requirement(s)	-
Traceability	FR-3.2.0

Use Case Identifier	UC-08
Use Case Name	ViewDetailedMatchInformation
Participating Actor(s)	Initiated by StaffMember
Flow of Events	1. A StaffMember selects a specific match from the list of matches. 2. The StaffMember selects the option to view detailed information about the selected match.
Entry Condition(s)	<ul style="list-style-type: none"> An instance of the algorithm must have been run.
Exit Condition(s)	<ul style="list-style-type: none"> The detailed match information is shown to the StaffMember
Quality Requirement(s)	-
Traceability	FR-3.0.0

Use Case Identifier	UC-09
Use Case Name	AddAnimalProfile
Participating Actor(s)	Initiated by StaffMember
Flow of Events	<ol style="list-style-type: none"> 1. A StaffMember selects the option to add a new animal. 2. The StaffMember fills out all of the necessary information to create the animal's profile. 3. The StaffMember saves the animal's new profile into the system.
Entry Condition(s)	<ul style="list-style-type: none"> • The StaffMember must be logged in to cuACS.
Exit Condition(s)	<ul style="list-style-type: none"> • The new profile is successfully saved OR • There is a FileError which aborts the operation.
Quality Requirement(s)	-
Traceability	FR-1.1.0

Use Case Identifier	UC-10
Use Case Name	EditAnimalProfile
Participating Actor(s)	Initiated by StaffMember
Flow of Events	<ol style="list-style-type: none"> 1. A StaffMember selects a specific animal's profile. 2. The StaffMember opens the detailed view of the selected animal's profile. 3. The StaffMember turns on a profile editing mode. 4. The StaffMember edits the desired fields in the animal's profile. 5. The StaffMember saves the altered profile.
Entry Condition(s)	<ul style="list-style-type: none"> • The StaffMember must be logged in to cuACS.
Exit Condition(s)	<ul style="list-style-type: none"> • The altered profile is successfully saved OR • There is a FileError which aborts the operation.
Quality Requirement(s)	-
Traceability	FR-1.3.0

Use Case Identifier	UC-11
Use Case Name	AddClientProfile
Participating Actor(s)	Initiated by StaffMember Communicates with Client
Flow of Events	<ol style="list-style-type: none"> 1. A StaffMember selects the option to add a new Client. 2. The StaffMember fills out all of the necessary information to create the Client's profile. 3. The StaffMember saves the Client's new profile into the system.

Entry Condition(s)	<ul style="list-style-type: none"> The StaffMember must be logged in to cuACS.
Exit Condition(s)	<ul style="list-style-type: none"> The new profile is successfully saved OR There is a FileError which aborts the operation.
Quality Requirement(s)	<ul style="list-style-type: none"> A Client's profile data should be stored securely to comply with local privacy laws.
Traceability	FR-2.1.0, NFR-30

Use Case Identifier	UC-12
Use Case Name	EditClientProfile
Participating Actor(s)	Initiated by StaffMember Communicates with Client
Flow of Events	<ol style="list-style-type: none"> 1. A StaffMember selects a specific Client's profile. 2. The StaffMember opens the detailed view of the selected Client's profile. 3. The StaffMember turns on a profile editing mode. 4. The StaffMember edits the desired fields in the Client's profile. 5. The StaffMember saves the altered profile.
Entry Condition(s)	<ul style="list-style-type: none"> The StaffMember must be logged in to cuACS.
Exit Condition(s)	<ul style="list-style-type: none"> The altered profile is successfully saved OR There is a FileError which aborts the operation.
Quality Requirement(s)	<ul style="list-style-type: none"> A Client's profile data should be stored securely to comply with local privacy laws.
Traceability	FR-2.3.0, NFR-30

Use Case Identifier	UC-13
Use Case Name	ViewAllAnimalProfiles
Participating Actor(s)	Initiated by StaffMember OR Initiated by Client
Flow of Events	<ol style="list-style-type: none"> 1. A StaffMember or a Client selects the option to view all animals.
Entry Condition(s)	<ul style="list-style-type: none"> The StaffMember is logged into cuACS OR The Client is logged into cuACS.
Exit Condition(s)	<ul style="list-style-type: none"> The list of all registered animals is displayed to the initiator.
Quality Requirement(s)	-
Traceability	FR-1.2.0, FR-1.2.2

Use Case Identifier	UC-14
Use Case Name	ViewDetailedAnimalProfile
Participating Actor(s)	Initiated by StaffMember OR Initiated by Client
Flow of Events	1. A StaffMember or a Client selects, from the list of all animal profiles, a specific animal profile. 2. The StaffMember or Client selects the option to view more detailed information about that animal.
Entry Condition(s)	<ul style="list-style-type: none"> The StaffMember is logged into cuACS OR The Client is logged into cuACS.
Exit Condition(s)	<ul style="list-style-type: none"> The detailed profile for the selected animal is displayed to the initiator.
Quality Requirement(s)	-
Traceability	FR-1.2.1, FR-1.2.3

Use Case Identifier	UC-15
Use Case Name	ViewAllClientProfiles
Participating Actor(s)	Initiated by StaffMember
Flow of Events	1. A StaffMember selects the option to view all Client profiles.
Entry Condition(s)	<ul style="list-style-type: none"> The StaffMember must be logged in to cuACS
Exit Condition(s)	<ul style="list-style-type: none"> A list of all Client profiles is shown to the StaffMember.
Quality Requirement(s)	-
Traceability	FR-2.2.0

Use Case Identifier	UC-16
Use Case Name	ViewDetailedClientProfile
Participating Actor(s)	Initiated by StaffMember
Flow of Events	1. A StaffMember selects, from the list of Client profiles, a specific Client profile. 2. The StaffMember selects the option to view more detailed information about that Client.
Entry Condition(s)	<ul style="list-style-type: none"> The StaffMember must be logged in to cuACS

Exit Condition(s)	<ul style="list-style-type: none"> The StaffMember is shown the detailed profile for the selected Client.
Quality Requirement(s)	-
Traceability	FR-2.2.1

Use Case Identifier	UC-17
Use Case Name	ViewOwnProfile
Participating Actor(s)	Initiated by Client
Flow of Events	1. The Client chooses the option to view their own profile.
Entry Condition(s)	<ul style="list-style-type: none"> The Client must be logged into their cuACS account.
Exit Condition(s)	<ul style="list-style-type: none"> The Client is shown their own profile.
Quality Requirement(s)	-
Traceability	FR-2.3.1

Use Case Identifier	UC-18
Use Case Name	EditOwnProfile
Participating Actor(s)	Initiated by Client
Flow of Events	1. A Client selects the option to edit their own profile. 2. The Client makes the desired changes to their profile. 3. The Client saves their altered profile.
Entry Condition(s)	<ul style="list-style-type: none"> The Client must be logged into their cuACS account.
Exit Condition(s)	<ul style="list-style-type: none"> The altered profile is successfully saved OR There is a FileError, aborting the operation.
Quality Requirement(s)	-
Traceability	FR-2.3.2

Use Case Identifier	UC-19
Use Case Name	MissingProfilesError
Participating Actor(s)	StaffMember
Flow of Events	1. The system notifies the StaffMember that there are insufficient profiles of either Clients or animals to run the ACM algorithm.
Entry Condition(s)	<ul style="list-style-type: none"> A “Launch ACM Algorithm” operation failed.

Exit Condition(s)	<ul style="list-style-type: none"> The algorithm does not run and the operation is aborted.
Quality Requirement(s)	-
Traceability	NFR-5

Use Case Identifier	UC-20
Use Case Name	SaveFile
Participating Actor(s)	Initiated by StaffMember OR Initiated by Client
Flow of Events	1. The initiator invokes the file saving system by saving whichever profile they are currently working on.
Entry Condition(s)	<ul style="list-style-type: none"> A new or altered profile file must be available to be saved.
Exit Condition(s)	<ul style="list-style-type: none"> The file is successfully saved OR The system returns a FileError aborting the process.
Quality Requirement(s)	-
Traceability	NFR-5

Use Case Identifier	UC-21
Use Case Name	FileError
Participating Actor(s)	StaffMember OR Client
Flow of Events	1. The system notifies the StaffMember or Client that an error has occurred with the chosen file operation.
Entry Condition(s)	<ul style="list-style-type: none"> A file processing operation failed.
Exit Condition(s)	<ul style="list-style-type: none"> The requested operation is aborted, reverting the state of the system to one before the change had taken place.
Quality Requirement(s)	-
Traceability	NFR-05

Use Case Identifier	UC-22
Use Case Name	FileFormatError
Participating Actor(s)	StaffMember OR Client
Flow of Events	1. The system notifies the StaffMember or Client that the profile file is corrupt or has an incomplete data format (specializes use case FileError).
Entry Condition(s)	<ul style="list-style-type: none"> The loading of a profile failed because the saved information is in an improper format.

Exit Condition(s)	<ul style="list-style-type: none"> The profile load operation is aborted.
Quality Requirement(s)	-
Traceability	NFR-05

Use Case Identifier	UC-23
Use Case Name	FileInputError
Participating Actor(s)	StaffMember OR Client
Flow of Events	1. The system notifies the StaffMember or Client that the profile file could not be read (specializes use case FileError).
Entry Condition(s)	<ul style="list-style-type: none"> A file read operation failed.
Exit Condition(s)	<ul style="list-style-type: none"> The profile load operation is aborted.
Quality Requirement(s)	-
Traceability	NFR-05

Use Case Identifier	UC-24
Use Case Name	FileOutputError
Participating Actor(s)	StaffMember OR Client
Flow of Events	1. The system notifies the StaffMember or Client that the profile file could not be written to persistent storage (specializes use case FileError).
Entry Condition(s)	<ul style="list-style-type: none"> A file write operation failed.
Exit Condition(s)	<ul style="list-style-type: none"> The profile save operation is aborted, reverting profiles to their previous, unchanged state.
Quality Requirement(s)	-
Traceability	NFR-05

Use Case Identifier	UC-25
Use Case Name	FileOpenError
Participating Actor(s)	StaffMember OR Client
Flow of Events	1. The system notifies the StaffMember or Client that the profile file could not be opened (specializes use case FileError).
Entry Condition(s)	<ul style="list-style-type: none"> A file open operation failed.
Exit Condition(s)	<ul style="list-style-type: none"> The requested operation (either save or load a profile) is aborted, reverting profiles to their previous, unchanged state.
Quality Requirement(s)	-

Traceability	NFR-05
--------------	--------

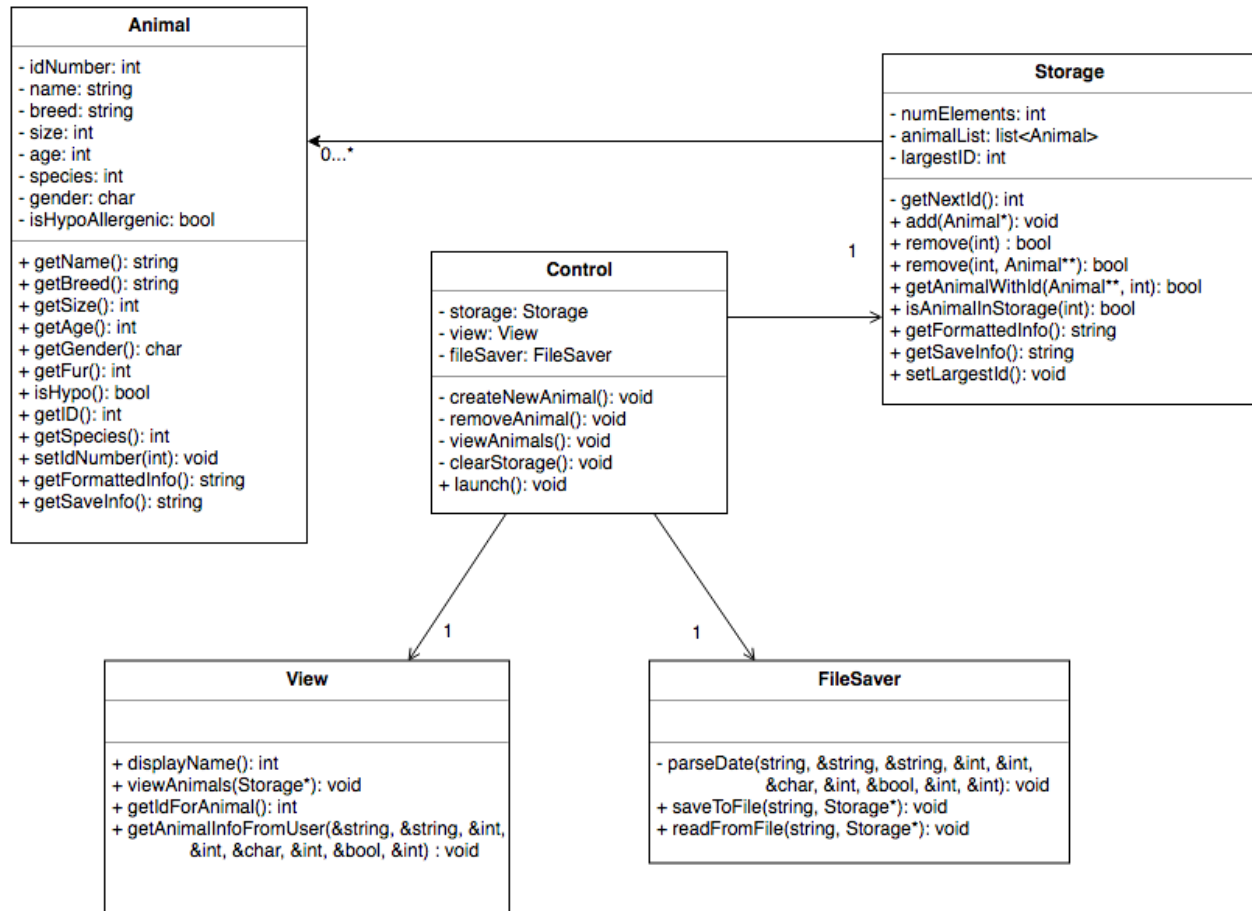
3. Object Model

3.1 Data Dictionary

Class Number	Traceability	Object Name	Attributes and Associations	Definition/Description
CN-01	UC-02, UC-03, UC-07, UC-09, UC-10, UC-13, UC-14	Animal	<ul style="list-style-type: none"> - idNumber - name - breed - size - age - species - gender - isHypoAllergenic 	- Animals, within the shelter, ready for adoption. Each animal has a set of attributes (unique physical, and non-physical), as well as a name. The set of non-physical and physical attributes are used in determining potential matches with clients, using the ACM algorithm.
CN-02	UC-05, UC-04, UC-07, UC-11, UC-12, UC-13, UC-14, UC-15, UC-16, UC-17, UC-18	Client	<ul style="list-style-type: none"> - Physical traits - Non-physical traits - Unique client ID number 	- An individual wishing to adopt an animal from the shelter. Each individual has their own physical characteristics, as well as non-physical characteristics that are used in determining a potential match with an animal, using the ACM algorithm.
CN-03	UC-01, UC-02, UC-03, UC-04, UC-06, UC-07, UC-08, UC-09, UC-10, UC-11, UC-12, UC-13, UC-14, UC-15, UC-16,	StaffMember	<ul style="list-style-type: none"> - Unique Staff ID number - staff member personal traits 	- An individual who is employed by the Shelter. Can also be a client of the shelter.
CN-04	UC-04, UC-05, UC-11, UC-12, UC-15, UC-16, UC-17, UC-	Client_Management_System	- Client	- An instance of the Client Management System, responsible for accessing client records and information, as well as sending new records/information to the

	18, UC-19			client storage device - Can be accessed by clients and staff members
CN-05	UC-02, UC-03, UC-09, UC-10, UC-13, UC-14, UC-19	Animal_Management_System	- Animal	- An instance of the Animal Management System, responsible for accessing animal records/information from the storage device. Also responsible for sending edits, changes and new information about the Animals to the storage device. - Can be accessed by staff members only
CN-06	UC-01, UC-06, UC-19, UC-07, UC-08	Control	- storage - view - fileSaver	- An instance of the Carleton University Animal Care System matching algorithm (cuACS), launched by a staff member - the object responsible for the flow and the control of various entity objects, such as animal, staffMember, and client, as well as interactions with the storage and saving
CN-07		View		- object responsible for the sending data to and from the graphical user interface
CN-08		Storage	- numElements - animalList - largestID	- the system used to store animals, clients, and other entity objects
CN-9	UC-20, UC-21, UC-22, UC-23, UC-24, UC-25	FileSaver		- object for reading and writing data to and from the data file storage

3.2 Class Diagram



4. Table of Terms Used

5. Table of Figures