DATA STRUCTURES AND DATA STORE DESCRIPTION

FIELD NAME	KEY	DATA TYPE	DATA SIZE/LENGT	H DESCRIPTION
FIELD NAME	NE I	DAIATTPE	DAIA SIZE/LENGI	n DESCRIPTION
CTDUCTUDE 4 DAW				
STRUCTURE-1 RAW		Integer	2 hydaa	Stores the ID for the eighting
Sighting ID Count	Primary Key not null	Integer Integer	2 bytes 2 bytes	Stores the ID for the sighting Number of birds spotted
Common Name	Hot Hull	Text	2 Dytes	Contains the common name of the bird
Species ID	Foreign Key	Integer	2 bytes	Stores the ID of the species sighted
New Species		Text	.,,,,,,	Contains the common name if species does not exist in database
Date Time	not null	Date-Time		Time at which sighting is recorded
Location Longitude	not null	Float	4 bytes	Longitude of sighting location
Location Latitude	not null	Float	4 bytes	Latitude of sighting location
User ID	Foreign Key	Integer	2 bytes	ID of the user who entered the sighting
Image		JPEG File		Image of the bird sighted
Upvotes		Integer	2 bytes	Contains the number of upvotes to the sighting
Downvotes		Integer	2 bytes	Contains the number of downvotes to the sighting
Credible		Boolean	1 byte	Indicates if the sighting is credible or not
			ngs that are inputted by the user	
FROM PROCESS: 3.3.2				
10 PROCESS: 3.3.2-Sig	ghting Retrieval, 2.3-	User Ratification, 2.2-	System Ratification, 2.4-Expert R	atification
OTDUOTUDE A DEEL	NED OLOUTING	`		
STRUCTURE-2 REFI			0 6:4	ID for the consulating information of an arise stability as which have
Sighting Id	Primary Key	Integer	2 bytes	ID for the cumulative information of species sightings which happened at a place and time
Species ID	Foreign Key	Integer	2 bytes	ID of the species sighted
Location	Foreign Key	Integer	2 bytes	ID of location
Count Number of Sightings	not null	Integer	2 bytes	Number of specimens seen Number of sightings of the specimen
Number of Signtings Month	not null	Integer Text	2 bytes 50 Characters	Stores the month of sighting
Image	TIOUTIUII	JPEG File	JU Ulialautela	Image of particular sighting
	ores the sightings wh		by users and can provide digestil	
FROM PROCESS: 2.3-U			· · · · · · · · · · · · · · · · · · ·	s.cc.mation about digitalityo
TO PROCESS: 3-Sightir				
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	CIES		I	
CTDIICTIIDE 2 CDE <i>l</i>	Primary Key	Intonor	2 hydae	ID of the energies
	Pililialy Nev	Integer	2 bytes	ID of the species
Species ID		Tovt		Common name of the energies
Species ID Common Name	not null	Text	50 Characters	Common name of the species
STRUCTURE-3 SPEC Species ID Common Name Scientific Name		Text	50 Characters 50 Characters	Common name of the species Scientific Name of the species
Species ID Common Name Scientific Name Image	not null not null	Text JPEG File		
Species ID Common Name Scientific Name Image DESCRIPTION: Stores i	not null not null information about spe	Text JPEG File ecies	50 Characters	
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Species ID Common Name Scientific Name Image DESCRIPTION: Stores i FROM PROCESS: 2.5-A	not null not null information about spe Add Species, 2.4-Ex	Text JPEG File ecies pert Ratification, 3.1.	50 Characters	
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Species ID Common Name Scientific Name Image DESCRIPTION: Stores i FROM PROCESS: 2.5-Add	not null not null information about species, 2.4-Ex Species, 3.1.1-Species	Text JPEG File ecies pert Ratification, 3.1.	50 Characters 1-Species Retrieval	Scientific Name of the species
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Species ID Common Name Scientific Name Image DESCRIPTION: Stores i FROM PROCESS: 2.5-Add STRUCTURE-4 LOCA Location ID Longitude Start Longitude End Latitude End DESCRIPTION: Stores t FROM PROCESS: 3.3.2-Lo STRUCTURE-5 USEI User ID Username E-mail Password DESCRIPTION: Stores t FROM PROCESS: 1.2-User STRUCTURE-6 USEI Username E-mail Password DESCRIPTION: Stores t FROM PROCESS: 1.2-User STRUCTURE-6 USEI Username E-mail Password DESCRIPTION: Stores t FROM PROCESS: 1.2-User	not null not null information about specation Retrieval cation Retrieval c	Integer Float Float Float Float Float Gis in which sightings I Integer Text Text Text Text Tothe user and user II Indler, 1.1- User Authenticat I Text Text Text Text Text Text Text Text	2 bytes 4 bytes 4 bytes 4 bytes 4 bytes have been submitted 2 bytes 50 Characters	Scientific Name of the species ID of the location grid Begining longitude of the grid Begining longitude of the grid Begining latitude of the grid Ending latitude of the grid Ending latitude of the grid Ending latitude of the grid ID for a particular user Name of the user Email Password Name of the user Email Password ID for a particular user
Species ID Common Name Scientific Name Image DESCRIPTION: Stores i FROM PROCESS: 2.5-Add STRUCTURE-4 LOCA Location ID Longitude Start Longitude End Latitude End DESCRIPTION: Stores t FROM PROCESS: 3.3.2-Lo STRUCTURE-5 USEI User ID Username E-mail Password DESCRIPTION: Stores t FROM PROCESS: 1.2-User STRUCTURE-6 USEI Username E-mail Password DESCRIPTION: Stores t FROM PROCESS: 1.2-User STRUCTURE-6 USEI Username E-mail Password DESCRIPTION: Stores t FROM PROCESS: 1.2-User STRUCTURE-7 USEI User ID Username E-mail	not null not null information about species, 2.4-Ex Species, 3.1.1-Species, 3.1.1	Integer Float Float Float Float Float Gos in which sightings I Integer Text Text Text Text Text Text Text Text	2 bytes 4 bytes 4 bytes 4 bytes 4 bytes have been submitted 2 bytes 50 Characters	Scientific Name of the species ID of the location grid Begining longitude of the grid Ending longitude of the grid Begining latitude of the grid Ending latitude of the grid Ending latitude of the grid Ending latitude of the grid ID for a particular user Name of the user Email Password Name of the user Email Password ID for a particular user Name of the user Email Password
Species ID Common Name Scientific Name Image DESCRIPTION: Stores i FROM PROCESS: 2.5-A TO PROCESS: 2.5-Add STRUCTURE-4 LOCA Location ID Longitude Start Longitude End Latitude End DESCRIPTION: Stores t FROM PROCESS: 3.3.2-Lo STRUCTURE-5 USEI User ID Username E-mail Password DESCRIPTION: Stores t FROM PROCESS: 1.2-User STRUCTURE-6 USEI Username E-mail Password DESCRIPTION: Stores t FROM PROCESS: 1.2-User STRUCTURE-6 USEI Username E-mail Password DESCRIPTION: Stores t FROM PROCESS: 1.2-User STRUCTURE-7 USEI User ID Username E-mail Password DESCRIPTION: Stores t FROM PROCESS: 1.2-User	not null not null information about species, 2.4-Ex Species, 3.1.1-Species ATIONS Primary Key not null not null not null the list of location grice. 2-Location Retrieval ocation Retrieval	Text JPEG File ecies spert Ratification, 3.1.7 ies Retrieval Integer Float Float Float Float ds in which sightings I Integer Text Text Text Text Tof the user and user II ndler, 1.1- User Authenticat Text Text Text Text Text Text Text Tex	2 bytes 4 bytes 4 bytes 4 bytes 4 bytes have been submitted 2 bytes 50 Characters 40 Characters	Scientific Name of the species ID of the location grid Begining longitude of the grid Begining longitude of the grid Begining latitude of the grid Ending latitude of the grid Ending latitude of the grid Ending latitude of the grid ID for a particular user Name of the user Email Password Name of the user Email Password ID for a particular user
Species ID Common Name Scientific Name mage DESCRIPTION: Stores i FROM PROCESS: 2.5-Add STRUCTURE-4 LOCA Location ID Longitude Start Longitude End Latitude End DESCRIPTION: Stores to FROM PROCESS: 3.3.2-Lo STRUCTURE-5 USEI Joer ID Joername E-mail Dassword DESCRIPTION: Stores to FROM PROCESS: 1.2-User STRUCTURE-6 USEI Joername E-mail Dassword DESCRIPTION: Stores to FROM PROCESS: 1.2-User STRUCTURE-6 USEI Joername E-mail Dassword DESCRIPTION: Stores to FROM PROCESS: 1.2-User STRUCTURE-7 USEI Joername E-mail Dassword DESCRIPTION: Stores to FROM PROCESS: 1.2-User STRUCTURE-7 USEI Joername Token DESCRIPTION: Stores to FROM PROCESS: 1.2-User STRUCTURE-7 USEI Joername Token DESCRIPTION: Stores to STRUCTURE-7 USEI Joername Token DESCRIPTION: Stores to STRUCTURE-7 USEI Joername Token DESCRIPTION: Stores to STRUCTURE-7 USEI Joername Token	not null not null information about specation Retrieval cation Retrieval c	Integer Float Float Float Float Gis in which sightings I Integer Text Text Text Text Tof the user and user II Indler, 1.1- User Authentica I Text Text Text Text Text Text Text Text	2 bytes 4 bytes 4 bytes 4 bytes 4 bytes have been submitted 2 bytes 50 Characters	Scientific Name of the species ID of the location grid Begining longitude of the grid Ending longitude of the grid Begining latitude of the grid Ending latitude of the grid Ending latitude of the grid Ending latitude of the grid ID for a particular user Name of the user Email Password Name of the user Email Password ID for a particular user Name of the user Email Password

DATA FLOW DESCRIPTION

DATA FLOW NAME	DESCRIPTION	FROM	то	DATA STRUCTURE
USER INFORMATION				
Login/Registration Details	Contains user's personal details	User Entity	1.2 User Info Handler	USER LOGIN DETAILS
		1 User Info process	User Info Table	
User Information	Contains user's information stored in the database	User Info Table	1.2 User Info Handler	USER INFORMATION
		1.2 User Info Handler	1.1- User Authentication	
Login Error	Contains an error message in case of non-existent user	1.2 User Info Handler	User Entity	Message String
User Auth Details	Contains authoritization taken of the uper May be generated by the process	20 1 1 Lloor Authorition	User Auth Details table	USER AUTHENTICATION DETAILS
Verified Auth Details	Contains authentication token of the user. May be generated by the proces Contains the verified token. Empty if token doesn't exist	User Auth Details table	1.1 User Authentication	USER AUTHENTICATION DETAILS USER AUTHENTICATION DETAILS
verified Autif Details	Contains the verified token. Empty if token doesn't exist	Osei Autii Detaiis table	1.1 Oser Admeritication	USER AUTHENTICATION DETAILS
User Info + Auth	Contains information about the user and authentication token	1.1 User Authentication	User Entity	USER INFORMATION + USER AUTHENTICATION DETAILS
OSCI IIIO : Addi	Contains information about the user and dathernioation token	1.1 Oser / tatriertasation	Coor Entity	GOERTINI ORIMINITION I GOERTIO ITTENTION DE INIEG
Request User Info + Auth	A request for user information along with authentication token	User Entity	1.1 User Authentication	USER AUTHENTICATION DETAILS.Token
Request User Information	A request for user info	1.1 User Authentication	1.2 User Info Handler	USER AUTHENTICATION DETAILS.User_Id
·		1.2 User Info Handler	User Info Table	USER AUTHENTICATION DETAILS.User_Id
Updated User Info + Auth	Contains updated user details and auth token	User Entity	1.1 User Authentication	USER INFORMATION + USER AUTHENTICATION DETAILS
Updated User Info	Contains the user information to be updated	1.1 User Authentication	1.2 User Info Handler	USER INFORMATION
SIGHTING INPUT				
Sighting Input + Auth	Contains the sighting information along with user and auth details	User Entity A	2.1 User Authentication	RAW SIGHTINGS + USER AUTHENTICATION DETAILS
User Auth Details	Contains authentication token of the user.	2.1 User Authentication	User Auth Details table	USER AUTHENTICATION DETAILS.Token
Verified Auth Details	Contains the verified authentication details. Empty if token doesn't exist	User Auth Details table	2.1 User Authentication	USER AUTHENTICATION DETAILS
Cighting Innut	Contains the sighting information	2.1 Hoor Authorities	2.2 System Delification	DAW SIGNIFINGS
Sighting Input	Contains the sighting information	2.1 User Authentication	2.2 System Ratification	RAW SIGHTINGS
		2.2 System Ratification 2.2 System Ratification	Raw Sighting Table 2.3 User Ratification	
		2.2 System Ratification 2.3 User Ratification	User Entity B	
		2.3 User Ratification	2.4 Expert Ratification	
		2.4 Expert Ratification	Expert	
		2 Export Natification	:port	
Species Info Request	Request for details of species based on common name	2.2 System Ratification	Species Table	RAW SIGHTINGS.common_name
Species Info	Details about the species. Empty if the species doesn't exist in table	Species Table	2.2 System Ratification	SPECIES
<u> </u>	- tand and an operation and operation of the control of the contro	- CP CO		
Refined Sighting Request	Request for refined sightings similar to raw sighting	2.2 System Ratification	Refined Sighting Table	RAW SIGHTINGS
Refined Sighting Info	Refined sighting details	Refined Sighting Table	2.2 System Ratification	REFINED SIGHTINGS
Updated Info	Updated raw sighting details	2.2 System Ratification	Refined Sighting Table	REFINED SIGHTINGS
Upvote/Downvote	Information about how the user voted	User Entity B	2.3 User Ratification	Boolean
Confirm/Deny + New Species	Expert approval information. If approved, contains new species info	Expert	2.4 Expert Ratification	SPECIES
New Species	Contains information about species to be added	2.4 Expert Ratification	Admin	SPECIES
		Admin	2.5 Add Species	
		2.5 Add Species	Species Table	
Confirmation	A confirmation managed to the ways	2.F. Add Chasins	Lloon Entitu	Chain a
Confirmation	A confirmation message to the user	2.5 Add Species	User Entity	String
SIGHTING RETRIEVAL				
PROCESS 3.1				
Request Species List	Request for a list of species based on common name input	User Entity	3.1.1 Species Retrieval	String
request species List	Trequest for a not or openies succe on comment frame input	3.1.1 Species Retrieval	Species Table	Curing
Species List Response	Contains a list of species	Species Table	3.1.1 Species Retrieval	SPECIES
		3.1.1 Species Retrieval	User Entity	
Species ID Sighting Request	Request for sightings of a scpecies based on ID	User Entity	3.1.1Species Retrieval	SPECIES.Species ID
<u> </u>		3.1.1 Species Retrieval	3.1.2 Sighting Retrieval	
		3.1.2 Sighting Retrieval	Refined Sighting Table	
Species sighting Response	List of refined sightings for the species	Refined Sighting Table	3.1.2 Sighting Retrieval	REFINED SIGHTINGS
		3.1.2 Sighting Retrieval	3.1.1 Species Retrieval	
		3.1.1 Species Retrieval	User Entity	
PROCESS 3.2		I =		In an analysis of the second
Request Location List	Request for a list of location grids based on a condition	User Entity	3.2.1 Locations Retrieval	Latitude, Longitude (Float)
Lagations lafe D	Contains the solid is subtable to the contains the solid in the contains the solid in the contains the contai	3.2.1 Locations Retrieval	Locations Table	LOCATIONS
Locaitons Info Response	Contains the grid in which the input location lies	Locations Table	3.2.1 Locations Retrieval	LOCATIONS
Location ID Circleting Description	Dogwoot for eightings at a location based on ID	3.2.1 Locations Retrieval	User Entity	LOCATIONS Location ID
Locaiton ID Sighting Request	Request for sightings at a location based on ID	User Entity 3.2.1 Locations Retrieval	3.2.1 Locations Retrieval	LOCATIONS.Location_ID
		3.2.1 Locations Retrieval 3.2.2 Sighting Retrieval	3.2.2 Sighting Retrieval Refined Sighting Table	
Location sighting Response	List of refined sightings for the location	Refined Sighting Table	3.2.2 Sighting Retrieval	REFINED SIGHTINGS
	List of rounds digramge for the location	3.2.2 Sighting Retrieval	3.2.1 Locations Retrieval	TEL INED GIGITINGO
		3.2.1 Locations Retrieval	User Entity	
	· ·	,		
PROCESS 3.3			3.3.1 User Authentication	USER AUTHENTICATION DETAILS.Token
PROCESS 3.3 Request User Sighting + Auth	A request containing user login and authentication token	User Entity		
	A request containing user login and authentication token Authentication Details of user	User Entity 3.3.1 User Authentication	User Auth Details table	USER AUTHENTICATION DETAILS.Token
Request User Sighting + Auth		-	User Auth Details table User Auth Details table	USER AUTHENTICATION DETAILS.Token USER AUTHENTICATION DETAILS
Request User Sighting + Auth Auth	Authentication Details of user Contains complete authentication info of the user	3.3.1 User Authentication User Auth Details table	User Auth Details table	USER AUTHENTICATION DETAILS
Request User Sighting + Auth Auth	Authentication Details of user	3.3.1 User Authentication User Auth Details table 3.3.1 User Authentication	User Auth Details table 3.3.2 Sighting Retrieval	
Request User Sighting + Auth Auth Verification	Authentication Details of user Contains complete authentication info of the user	3.3.1 User Authentication User Auth Details table	User Auth Details table	USER AUTHENTICATION DETAILS
Request User Sighting + Auth Auth Verification User ID	Authentication Details of user Contains complete authentication info of the user A request for user's sightings	3.3.1 User Authentication User Auth Details table 3.3.1 User Authentication 3.3.2 Sighting Retrieval	User Auth Details table 3.3.2 Sighting Retrieval Raw Sighting Table	USER AUTHENTICATION DETAILS USER AUTHENTICATION DETAILS.User_Id
Request User Sighting + Auth Auth Verification	Authentication Details of user Contains complete authentication info of the user	3.3.1 User Authentication User Auth Details table 3.3.1 User Authentication 3.3.2 Sighting Retrieval Raw Sighting Table	User Auth Details table 3.3.2 Sighting Retrieval Raw Sighting Table 3.3.2 Sighting Retrieval	USER AUTHENTICATION DETAILS
Request User Sighting + Auth Auth Verification User ID	Authentication Details of user Contains complete authentication info of the user A request for user's sightings	3.3.1 User Authentication User Auth Details table 3.3.1 User Authentication 3.3.2 Sighting Retrieval Raw Sighting Table 3.3.2 Sighting Retrieval	User Auth Details table 3.3.2 Sighting Retrieval Raw Sighting Table 3.3.2 Sighting Retrieval 3.3.1 User Authentication	USER AUTHENTICATION DETAILS USER AUTHENTICATION DETAILS.User_Id
Request User Sighting + Auth Auth Verification User ID	Authentication Details of user Contains complete authentication info of the user A request for user's sightings	3.3.1 User Authentication User Auth Details table 3.3.1 User Authentication 3.3.2 Sighting Retrieval Raw Sighting Table	User Auth Details table 3.3.2 Sighting Retrieval Raw Sighting Table 3.3.2 Sighting Retrieval	USER AUTHENTICATION DETAILS USER AUTHENTICATION DETAILS.User_Id

LEVEL-1 PROCESS DESCRIPTION

S No.	Process Name	Description	Inbound Data Flows	Outbound Data Flows
1	User Information Process	Handles any operation related to user information, which includes registration, login, logout and retrieving user information or update user information. The process also creates and handles authentication tokens for verification tasks.	Login/Registration Information, Request for user Information and Authentication, Updated user information and Authentication, User Information	Request for user information, Login/Registration info, Updated Information
2	Sighting Input Process	Handles operations related to taking new sighting input from the user and sending it for ratification to other users, and in extreme scenarios to experts and then adding the ratified sighting to database. The process also ratifies sightings automatically.	New Sighting Input and authentication details, Upvote/Downvote from user, Confirmation/Denial from expert	Confirmation/Denial response to sighting owner, User Ratification request, Expert Ratification request, Sighting Info
3	Sighting Retrieval Process	This process handles operations which are required for retrieving data related to sightings. The data may be retrieved on the basis of location, species, time or the sightings that the user has submitted.	Location Sighting Request, Species Sighting Request, User Sighting Request, User's Sightings, Refined Sightings	Sighting Requests, Sighting Responses