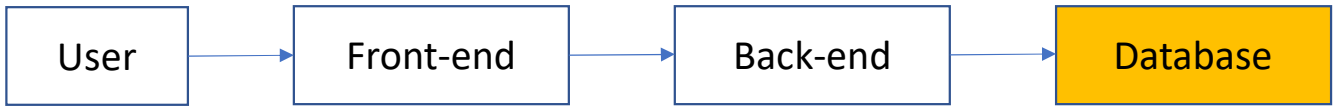
Data

Data

The whole project consists of stages



These slides describe data storage and database

Choosing the right data store

- The Database Management System (DBMS) provides a service by processing requests from people and applications that want to use its services
- Users connect to the database server from other computers over the network
- This project requires regular create, read, update, delete operations since the users will be uploading new projects, updating and deleting projects
- It is useful to have a database that allows different records to have different fields, especially during development of the project.

Choosing the right data store

- Relational databases (Structured Query Language SQL) consist of structured tables, holding any number of records of the same type.
- Relational databases have a rigid structure defined by a schema, good for safety of data, but complicated and hard to maintain
- Document-oriented databases don’t have a schema
- Document-oriented databases allow different records to have different fields.

MongoDB

- MongoDB has been chosen for data storage
- MongoDB uses JSON (JavaScript Object Notation)-like documents for data storage, it is a document-oriented database program
- Records are stored in collections, making it easier to collect similar records together and display similar records together on a page.
- Records are contained in key-value pairs
- MongoDB is more accessible to non-experts.

Conceptual phase ‘categories’

For categories (roughly 10), there should be:-

- category name

Conceptual phase ‘tasks’

- Each project belongs to a category
- Each project should have a name
- Each project should contain a description
- An estimate of cost would be useful
- An estimate of time should be included
- The username of the creator of the project entry should be displayed
- An image should be added, with description

Conceptual phase ‘survey_links’

- For the wildlife surveys page, there should be a
- Link name
- Link web address

Conceptual phase ‘users’

- For each user that creates an account or logs in
- There should be a username provided
- There should be a password with security measures to encrypt it
- There should be an email address provided in case admin needs to get in touch

Data types, null values

- Most entries are short strings of text characters, with min and max length
- Description should be a longer string of text
- The switch that promotes good projects and ideas to the home page is Boolean
- Images are stored as url addresses for this project, so the images themselves are stored elsewhere (recommended by Code Institute for this project)
- Image descriptions are requested because this improves accessibility of the app.
- All key values must have data input (e.g. project name, created_by, category).

Physical design for data

- Indexes are needed for the project name and project description to allow searches to be done on the text in the project name and description.
- Searches should be possible for Home and People’s projects pages

CRUD (Create, Read, Update and Delete)

- Create:- in the case of this project, a new record created would be the title, category, description, cost , time to complete, due date, created by, image, image description plus a switch which decides on which page it appears.
- Read only access is available before creating an account, more data can be accessed after login, especially if user is an admin.
- Updates can be done to any field(s) including the switch if user is the admin, excluding the switch if user is not the admin and to other fields if the project is the user's own.
- Delete function is allowed for projects if user is the admin or if user is deleting their own project.
- CRUD access is granted to the admin for the list of links in wildlife surveys page. It is read only for other users.

CRUD Permissions

- The home page should be read only for all users except for the admin.
- The admin can add to, edit and delete projects on the home page.
- The People's Projects page projects should be read only unless the user is an admin or the user created the projects.
- The profile page lists a users own projects so the user is allowed to add to, edit and delete those projects.
- The wildlife surveys links can be altered by the admin only via add, edit and delete operations.
- The admin only has access to the categories page and can add to, edit and delete categories.
- Contact users page is currently read only by the admin user

CRUD

- These four operations are essential for managing data.
- They are known as the data manipulation operations
- Create is the operation of adding a new record to a data store
- Update is the operation of changing one or more fields in existing records
- Delete is the operation of completely removing a record from the data store, opposite of create
- Read is the request to retrieve some information from the data store without changing anything

Data in MongoDB

- _id: ObjectId (Generated by Mongo DB)
- category_name: E.g. Bats
- task_name: E.g. Bee hotel
- task_description: Up to 200 characters of description
- Estimated_cost: £££ or Free!
- Estimated_time: E.g. 2 hours
- Image_url: E.g. https://cdn.pixabay.com/photo/2016/08/31/14/47/flying-dog-1633706__340.jpg
- Image_description: This help accessibility
- created_by: This field contains the person's username
- On_homepage: "on" or "off"

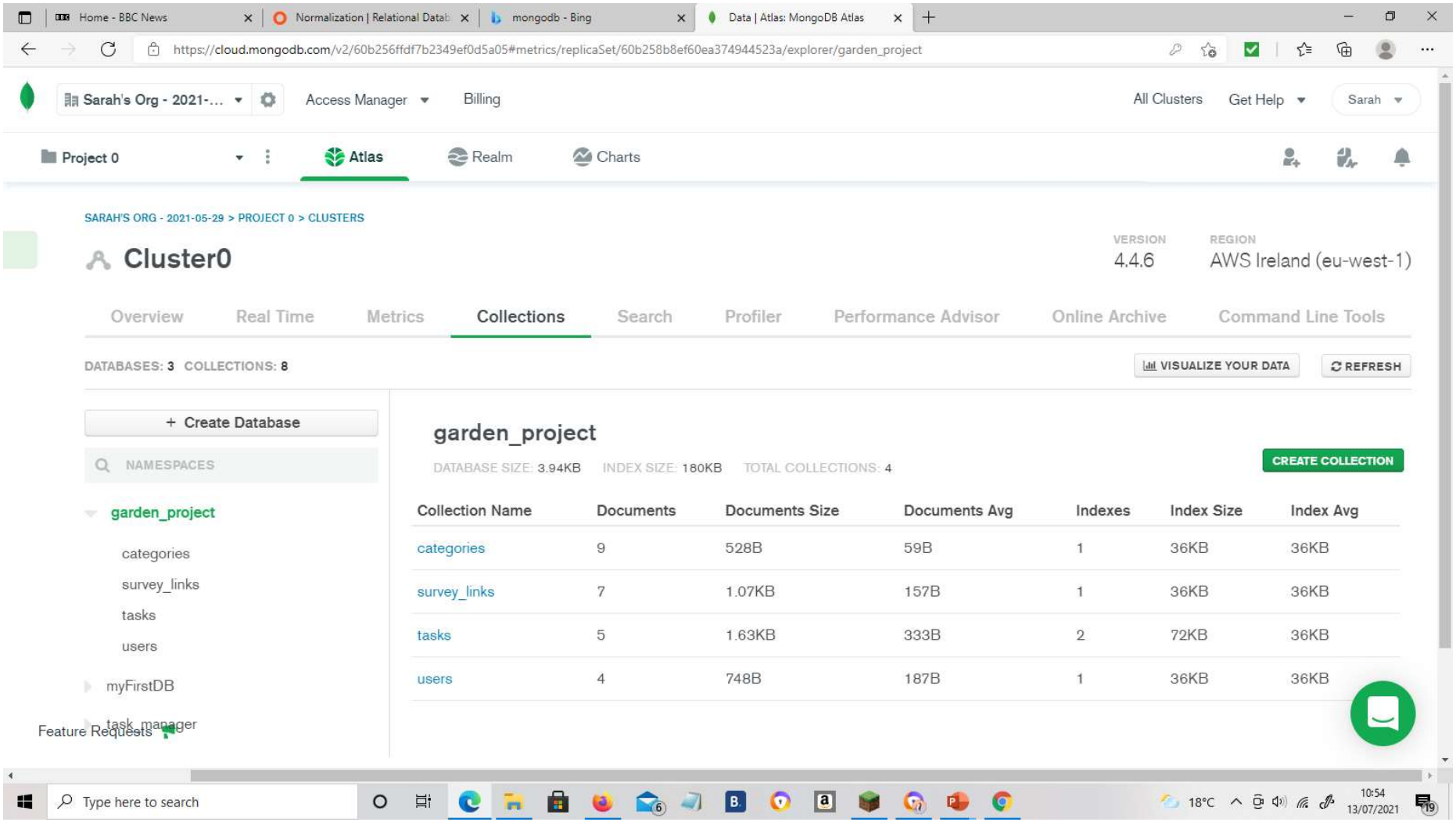
Data in MongoDB ‘categories’

- _id: ObjectId (Generated by Mongo DB)
- Category_name: E.g. Shelter

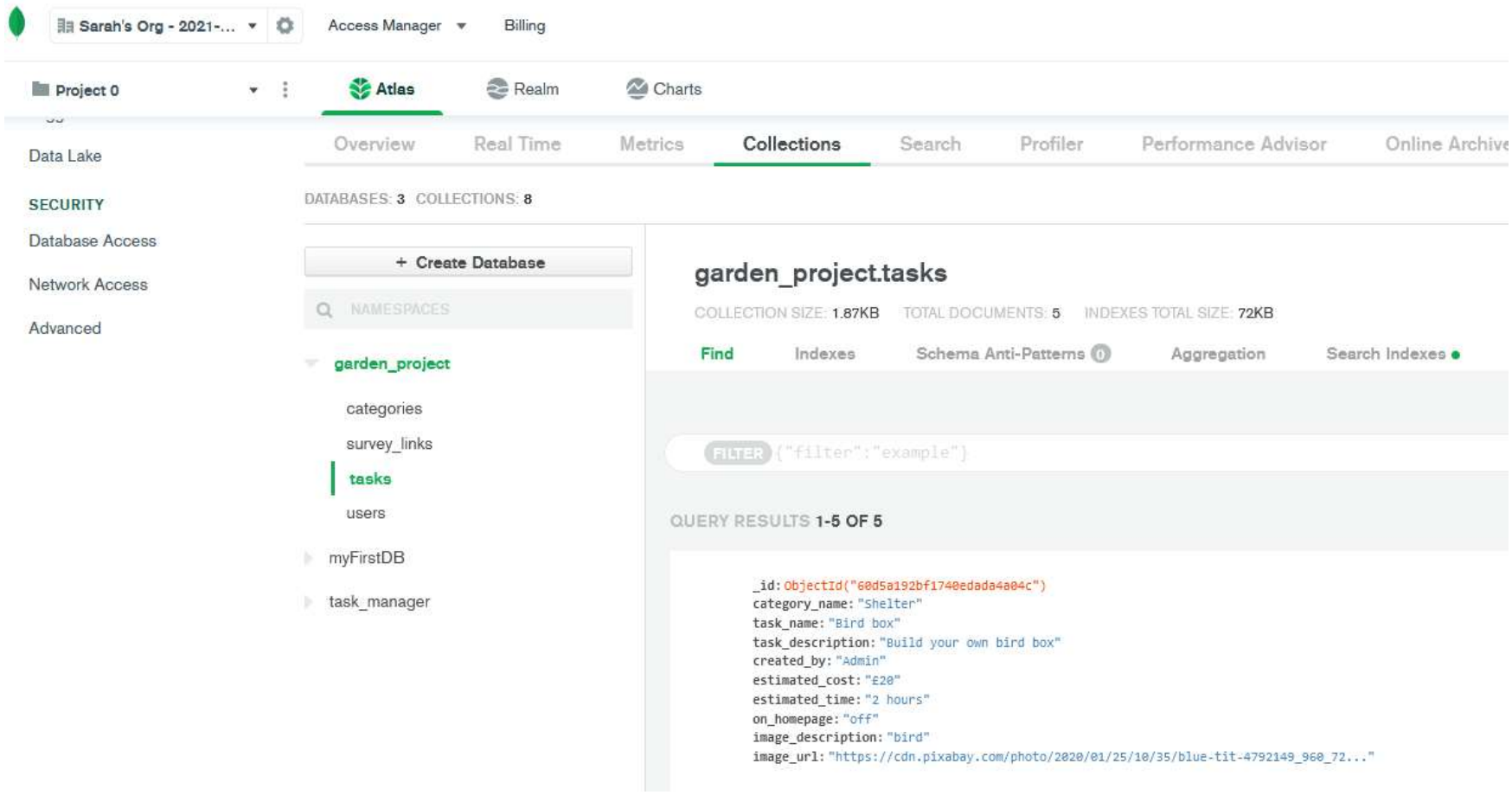
Data in MongoDB ‘users’

- _id: ObjectId (Generated by Mongo DB)
- username: E.g. Admin
- password: **********
- email: E.g. admin1@gmail.com

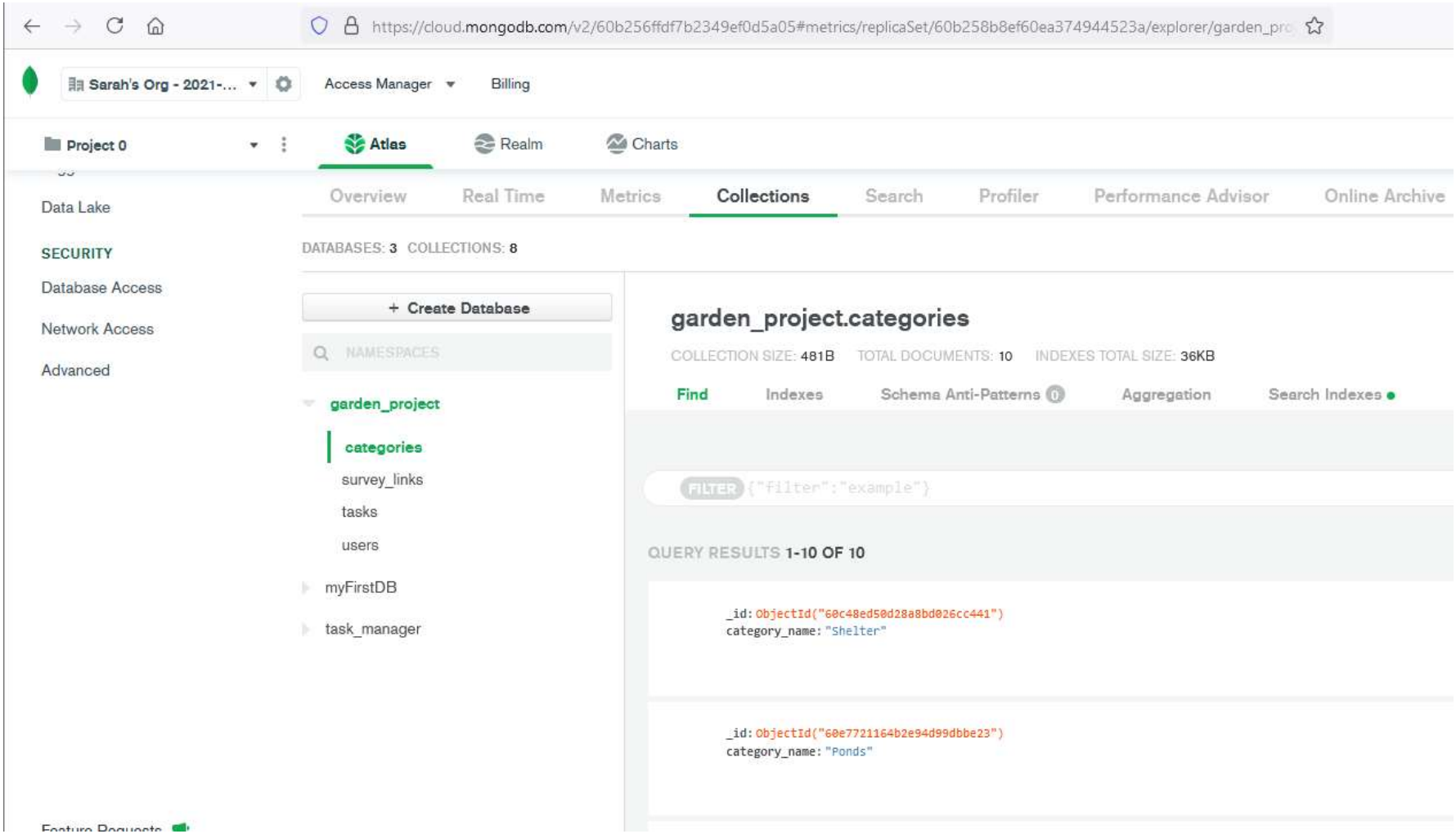
Set up of Mongo DB



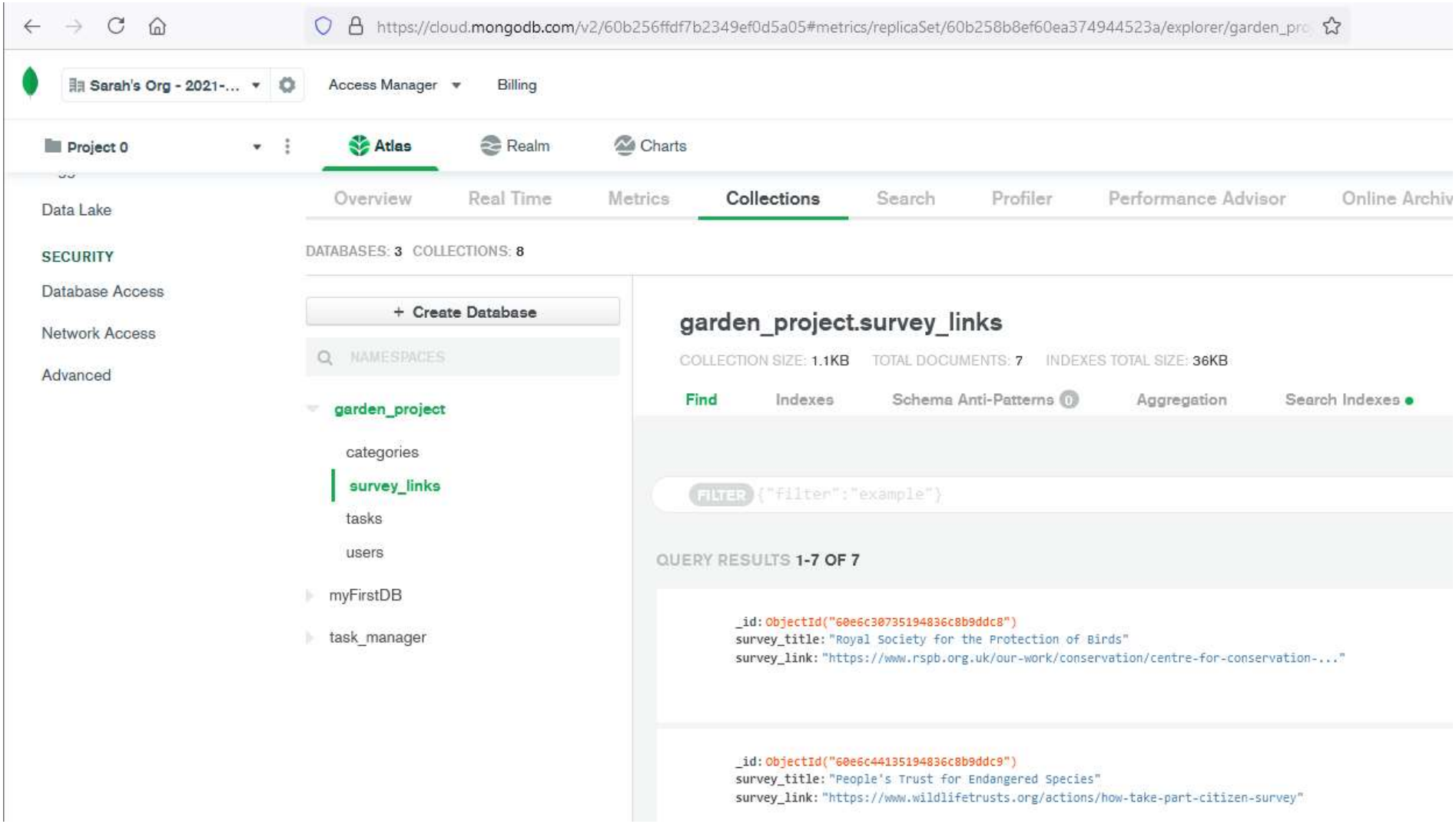
Set up of Mongo DB ‘tasks’



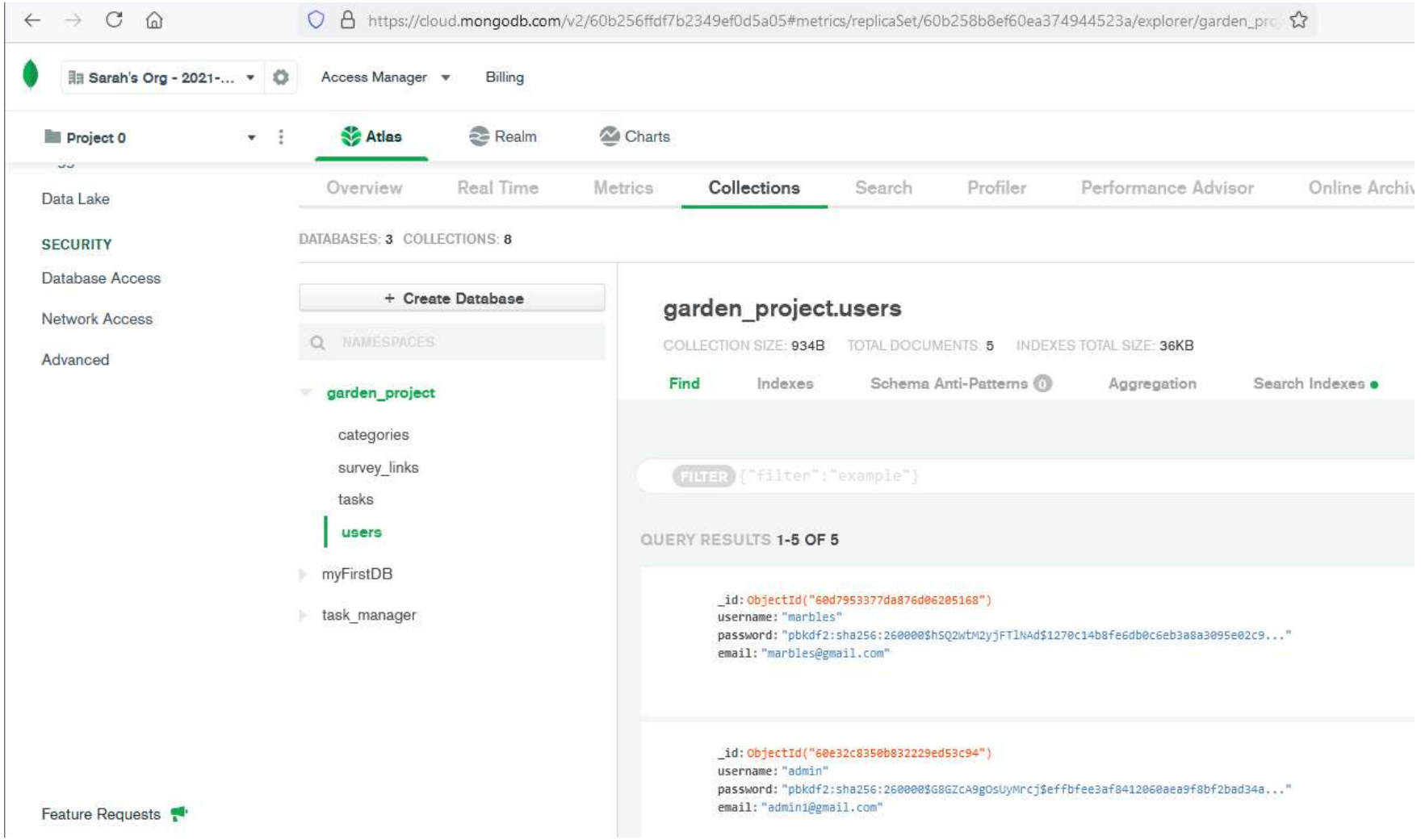
Set up of Mongo DB ‘categories’



Set up of Mongo DB ‘survey_links’



Set up of Mongo DB ‘users’



Starting data

- Categories:-
- Aquatic Life
- Birds
- Bats
- Bugs
- Hedgehogs
- Shelters
- Food
- Pest Control
- Maintenance
- Ponds

Starting data

- Wildlife surveys

- Royal Society for the Protection of Birds
- https://www.rspb.org.uk/our-work/conservation/centre-for-conservation-science/working-with-us/surveys/
- People's Trust for Endangered Species
- https://ptes.org/get-involved/surveys/
- National Biodiversity Network
- https://nbn.org.uk/tools-and-resources/useful-websites/database-of-wildlife-surveys-and-recording-schemes/
- National Trust
- https://www.nationaltrust.org.uk/minchinhampton-and-rodborough-commons/features/wildlife-surveys
- The Wildlife Trusts
- https://www.wildlifetrusts.org/actions/how-take-part-citizen-survey
- Woodlands.co.uk
- https://www.woodlands.co.uk/blog/flora-and-fauna/wildlife-surveys/
- Buglife
- https://www.buglife.org.uk/get-involved/surveys/

Starting data

- _id: ObjectId (Generated by Mongo DB)
- category_name: Pest control
- task_name: Copper tape for slugs
- task_description: Slug slime reacts with copper to produce electric shocks
- Estimated_cost: £4-£10
- Estimated_time: 1 hour
- Image_url: https://cdn.pixabay.com/photo/2016/05/24/08/20/snail-1411921__340.jpg
- Image_description: snail
- created_by: This field contains the person's username
- On_homepage: "on" or "off"

Starting data

- _id: ObjectId (Generated by Mongo DB)
- category_name: Bat
- task_name: Bat shelter
- task_description: Create a wooden bat shelter or buy one. Required: wood 15cm X1mX1.5cm thick, ladder. Drill, screws saw and nails
- Estimated_cost: £20-£50 when bought
- Estimated_time: 5 hours when made
- Image_url: E.g. https://cdn.pixabay.com/photo/2016/08/31/14/47/flying-dog-1633706__340.jpg
- Image_description: bat
- created_by: This field contains the person's username
- On_homepage: "on" or "off"

Starting data

- _id: ObjectId (Generated by Mongo DB)
- category_name: Food
- task_name: Bird food
- task_description: Birds like apples and berries, suet and lard (not previously used in cooking), seeds (use sunflower and nyger seeds)
- Estimated_cost: £1.50-£10 when bought
- Estimated_time: 15 minutes when made
- Image_url: E.g. https://cdn.pixabay.com/photo/2020/05/31/04/23/sparrow-5241218__340.jpg
- Image_description: sparrow feeder
- created_by: This field contains the person's username
- On_homepage: "on" or "off"

Starting data

- _id: ObjectId (Generated by Mongo DB)
- category_name: Aquatic Life
- task_name: Pond depth
- task_description: Varying the depth of a pond from 2cm to 10 cm will support much more wildlife than a pond of only one depth, especially if over 30cm deep.
- Estimated_cost: £1.50-£10
- Estimated_time: 2 hours when made
- Image_url: E.g. https://cdn.pixabay.com/photo/2018/06/16/15/36/water-lily-3478924__340.jpg
- Image_description: sparrow feeder
- created_by: This field contains the person's username
- On_homepage: "on" or "off"

Starting data

- _id: ObjectId (Generated by Mongo DB)
- category_name: Birds
- task_name: Bird food
- task_description: Birds like apples and berries, suet and lard (not previously used in cooking), seeds (use sunflower and nyger seeds)
- Estimated_cost: £1.50-£10 when bought
- Estimated_time: 15 minutes when made
- Image_url: E.g. https://cdn.pixabay.com/photo/2020/05/31/04/23/sparrow-5241218__340.jpg
- Image_description: sparrow feeder
- created_by: This field contains the person's username
- On_homepage: "on" or "off"

Starting data

- _id: ObjectId (Generated by Mongo DB)
- category_name: Shelter
- task_name: Hedgehog shelter
- task_description: Make a main chamber plus tunnel or buy one ready-made
- Estimated_cost: £20-£50 when bought
- Estimated_time: 4 hours when made
- Image_url: E.g. https://cdn.pixabay.com/photo/2019/11/11/13/51/hedgehog-house-4618390__340.jpg
  Image_description: hedgehog house
- created_by: This field contains the person's username
- On_homepage: "on" or "off"

Starting data

- _id: ObjectId (Generated by Mongo DB)
- category_name: Bugs
- task_name: Bug shelter
- task_description: Bamboo canes can be cut up and fitted into empty bottles for a starter shelter
- Estimated_cost: £10-£40 when bought
- Estimated_time: 3 hours when made
- Image_url: E.g. https://cdn.pixabay.com/photo/2015/12/09/18/12/insect-house-1085197__340.jpg
- Image_description: insect house
- created_by: This field contains the person's username
- On_homepage: "on" or "off"

Starting data

- _id: ObjectId (Generated by Mongo DB)
- category_name: Hedgehogs
- task_name: Hedgehog highways
- task_description: Create gaps in fences, even design gaps into new buildings to allow movement of animals between properties
- Estimated_cost: £0 -£50
- Estimated_time: 15 minutes if a fence
- Image_url: E.g. https://cdn.pixabay.com/photo/2018/01/07/09/08/nature-3066823_960_720.jpg
- Image_description: hedgehog
- created_by: This field contains the person's username
- On_homepage: "on" or "off"

Starting data

- _id: ObjectId (Generated by Mongo DB)
- category_name: Shelter
- task_name: Bird shelter
- task_description: Create a wooden bat shelter or buy one. Required: wood 15cm X1mX1.5cm thick, ladder. Drill, screws saw and nails
- Estimated_cost: £10-£50 when bought
- Estimated_time: 5 hours when made
- Image_url: E.g. https://cdn.pixabay.com/photo/2016/04/11/18/25/blue-tit-1322644__340.jpg
- Image_description: bird shelter
- created_by: This field contains the person's username
- On_homepage: "on" or "off"

Starting data

- _id: ObjectId (Generated by Mongo DB)
- category_name: Maintenance
- task_name: Wildflower patch
- task_description: Plant a wildflower patch or just allow one to grow. Cut a path through the middle. This helps bees and other insects
- Estimated_cost: £1.50-£5 when seeds bought
- Estimated_time: 0 - 15 minutes
- Image_url: E.g. https://cdn.pixabay.com/photo/2018/05/30/12/02/poppy-3441348_960_720.jpg
- Image_description: wild flowers poppy
- created_by: This field contains the person's username
- On_homepage: "on" or "off"

Starting data

- _id: ObjectId (Generated by Mongo DB)
- category_name: Ponds
- task_name: Wildlife friendly pond
- task_description: Place rocks and shrubs around pond, plank in middle of pond to help animals escape if they fall in
- Estimated_cost: £3-£20
- Estimated_time: 15 minutes
- Image_url: E.g. https://cdn.pixabay.com/photo/2018/06/16/15/36/water-lily-3478924__340.jpg
- Image_description: water-lily
- created_by: This field contains the person's username
- On_homepage: "on" or "off"

Merging collections in the project

- The projects contributed by app users were kept in a separate collection to the collection containing projects put on the home page by the admin, initially.
- A feature to implement was the transfer of very good projects from the people's project page to the home page.
- It is much easier to transfer projects between pages if they belong to the same collection in MongoDB and the projects only differ by a key-value pair.
- The difference in projects is implemented by a switch in the app which is controlled by the admin.
- The project required fewer collections in MongoDB later in its development as a result.