Problem Description and proposal:

As of this year, ten out of the sixteen land species of hermit crab have been spotted wearing ‘artificial shells’ such as lego pieces, bottle caps, broken light bulbs, and much more. Although the effects of using ‘artificial shells’ aren’t yet researched in a lot of detail, scientists have already found out that countless crabs have died by getting stuck in wheels or water bottles, thinking of making those objects into their new home. My proposed project is a database for a startup company that can 3D print safer and better shells for hermit crabs, and then use cameras attached to said shells to conduct more research into the problem.

I am making a database for a company that 3D prints shells for hermit crabs to use as homes. The shells will be created using 3D printers at factories, where the environmental impact will be closely monitored. Each 3D shell produced will have an attached camera that will collect information on the surroundings (particularly keeping track of fellow crabs, and the ‘artificiality’ of their shells), as well as a monitor that keeps track of the crab’s health. The database will also have information on the people involved, such as the employees in the 3D printer factories and scientists observing the hermit crabs.

Nouns

- Shells
- Crabs
- Factories
- Printers
- Cameras
- Health monitors
- Employees
- Scientists

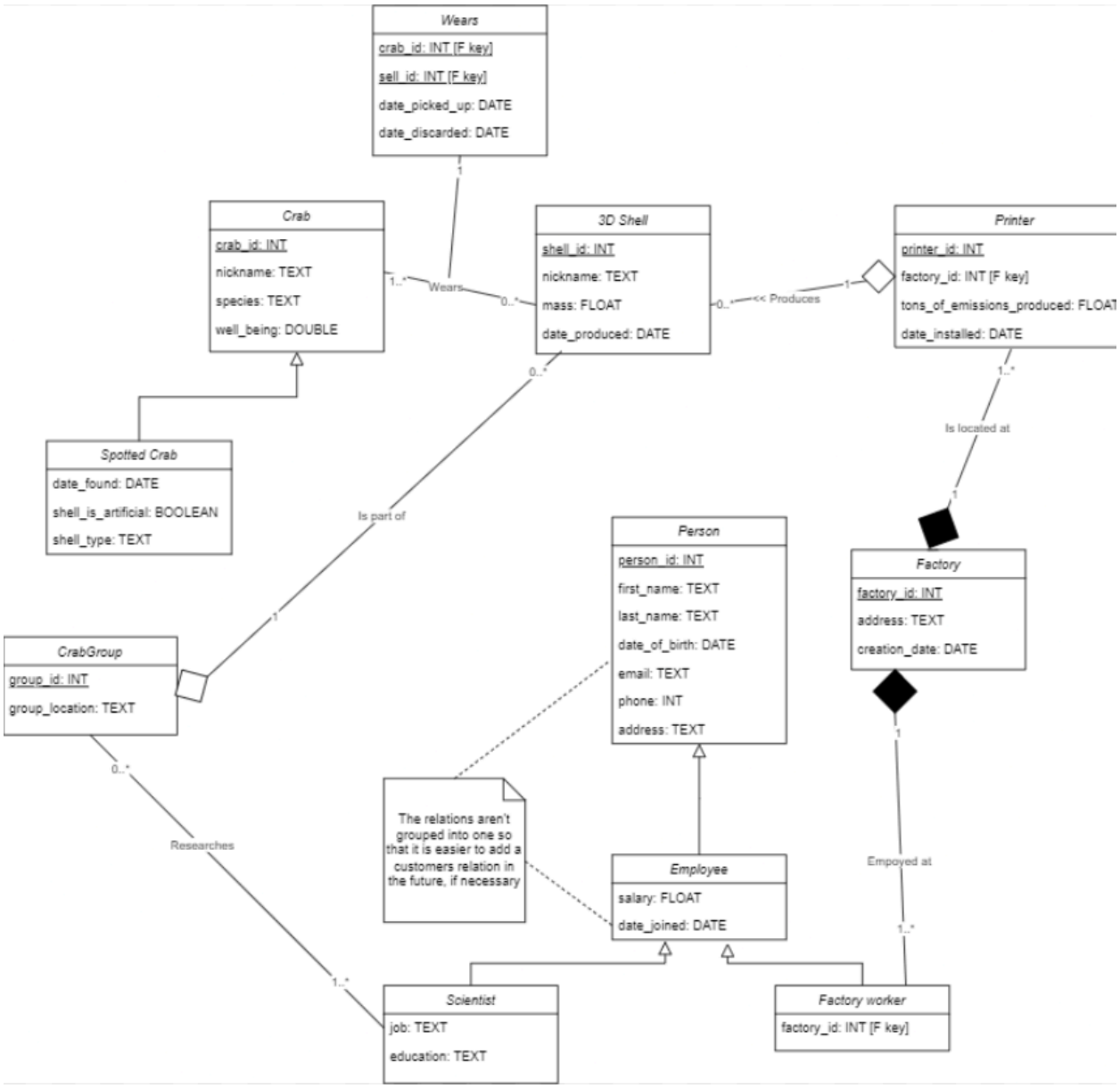
Verbs

- Manufacture
- Equip
- Monitor
- Record
- Document
- Study
- Access
- Observe

Rules of the Database:

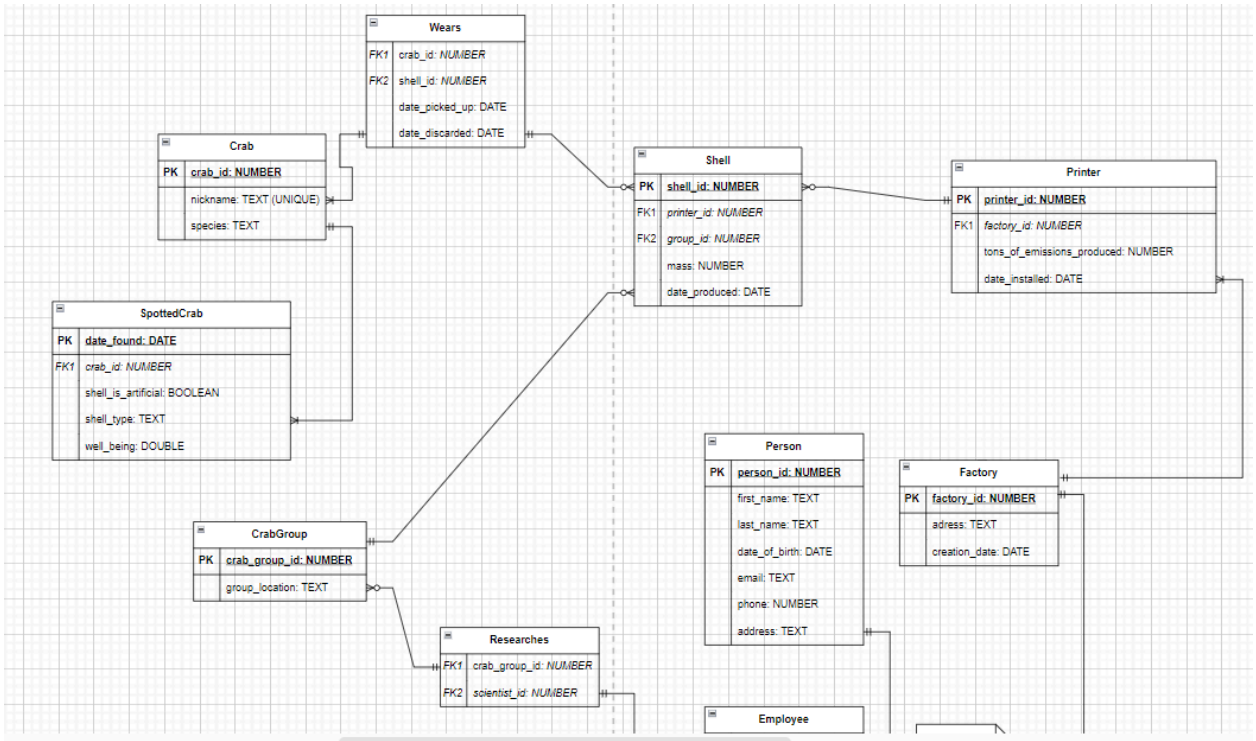
1) Each 3D-printed shell must be equipped with a camera for environmental monitoring and a health monitor for tracking the crab's well-being.
2) Information on the manufacturing process, including the factory and printers used, must be recorded and monitored for environmental impact.
3) Data on the crabs, including general classifications, spotted crabs (those observed by crabs with 3D shells), and crabs with 3D shells, must be maintained.
4) 3D shells must all be divided into groups based on the location where the shells were originally placed.
5) Personnel involved in the project, such as factory employees and scientists studying the crabs, need to be documented.
6) Scientists assigned to shell groups should have access to monitoring tools to observe the assigned crabs' behavior and health.
7) A crab could be spotted multiple times, and each time it would be added as a ‘spotted crab’, thus keeping track of the crab throughout its life

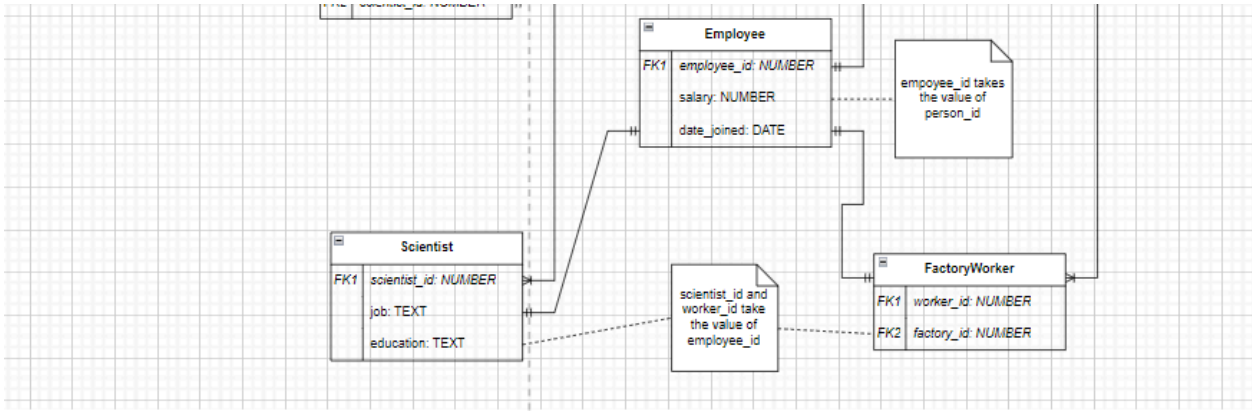
Link to the UML diagram:



https://drive.google.com/file/d/1x4-Ncc4ipYcq9NcAbxSnOqSebv5DiAyp/view?usp=sharing

Link to the ERD diagram:





(Split into 2 images as the full image is too pixelated)
https://drive.google.com/file/d/15WQZBDzi7KoqbwVTqgn8DauN-6FNkZqu/view?usp=sharing

Relational Schema:

Crab(crab_id: INTEGER, nickname: TEXT UNIQUE, species: TEXT, well_being: DOUBLE)

SpottedCrab(*crab_id: INTEGER*, date_found: DATE, shell_is_artificial: BOOLEAN, shell_type: TEXT)

CrabGroup(crab_group_id: INTEGER, group_location: TEXT)

Shell(shell_id: INTEGER, *printer_id: INTEGER, group_id: INTEGER*, mass: NUMBER, date_produced: DATE)

Wears(*crab_id: INTEGER, shell_id: INTEGER*)

Printer(printer_id: INTEGER, *factory_id: INTEGER*, tons_of_emissions_produced: NUMBER, date_installed: DATE)

Factory(factory_id: INTEGER, address: TEXT, creation_date: DATE)

Person(person_id: INTEGER, first_name: TEXT, last_name: TEXT, date_of_birth: DATE, email: TEXT, phone: NUMBER, address: TEXT)

Employee(*employee_id: INTEGER*, salary: NUMBER, date_joined: DATE)

Scientist(*scientist_id: INTEGER*, job: TEXT, education: TEXT)

Researches(*crab_group_id: INTEGER, scientist_id: INTEGE*R)

FactoryWorker(*worker_id: INTEGER*, *factory_id: INTEGER*)