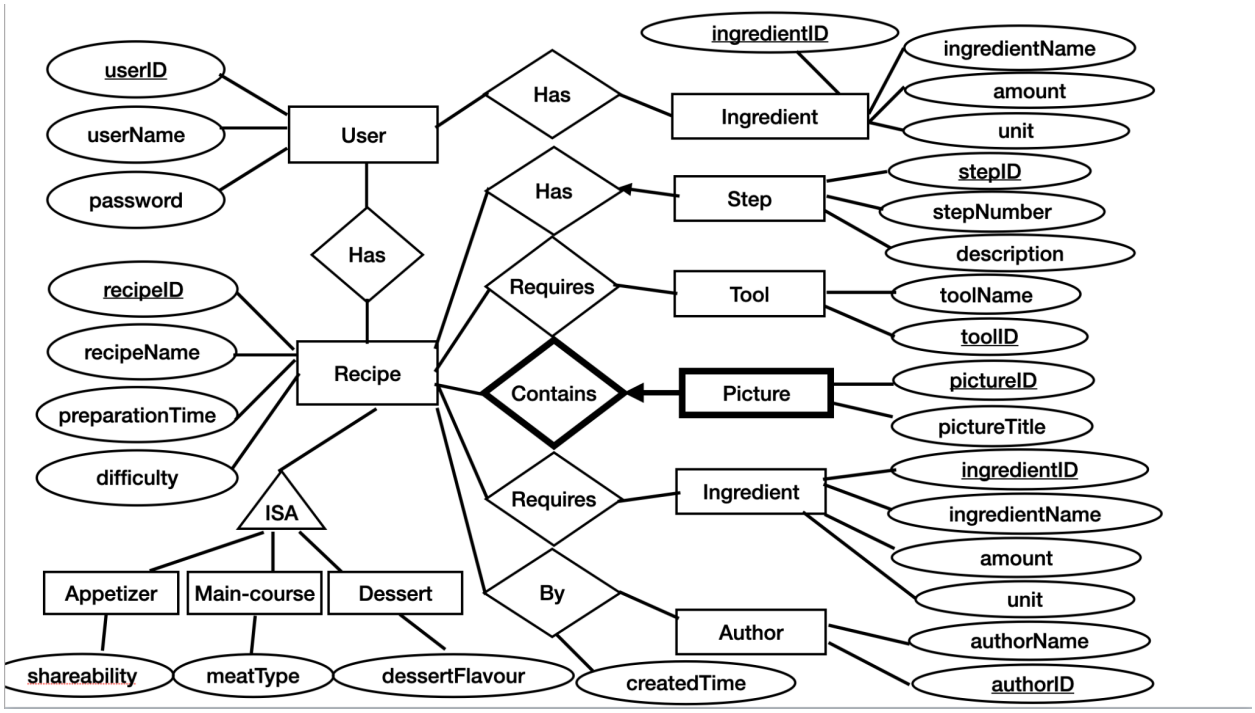
Milestone #1



The domain that we will model is a virtual cookbook. That is, we will focus on the data that is stored about different users, their saved recipes, and the recipes' corresponding instructions and required ingredients and equipment.

We will focus on different cookbook users and their data, namely their saved recipes and the recipes' information, for example, ingredients, photos, and author. There will be multiple recipe types, such as ones for appetizers, main-course meals, and desserts so that users are able to retrieve recipes to cook whatever type of food they feel is necessary for their diet.

Users will be able to update their own recipes' information, like descriptive features, who the author is, the directions, etc as well as view other users' recipes. However, a user may only edit the information of a recipe that they themselves created. Users can also sort recipes by their respective type. There will also be a functionality where users will be able to compare the ingredients they currently have at home to required ingredients for recipes so that they can see what they are able to make without going shopping. Overall, for this application, the use of a database is advantageous because users and recipes can be efficiently queried using identifiers and each recipe has lots of information that needs to be stored.

This project will be done using the CPSC department's Oracle database system, using Java and JDBC, as well as possibly HTML, CSS, and JavaScript for a frontend GUI. We do not anticipate using any special software or hardware.

Milestone #2

1. Cover page

2. Relational Schema

User(userID, userName, password)
Recipe(recipeID, recipeName, preparationTime, difficulty)
Dessert(**recipeID**, dessertFlavour)
MainCourse(**recipeID**, meatType)
Appetizer(**recipeID**, shareability)
Step_Has(stepID, stepNumber, stepDescription, **recipeID**)
Tool(toodID, toolName)
Picture_Contains(**recipeID**, pictureID, pictureTitle)
Ingredient(ingredientID, ingredientName, amount, unit)
Author(authorID, authorName)
Has(**userID**, **recipeID**)
By(**recipeID**, **authorID**, createdTime)
Requires(**recipeID**, **ingredientID**)
Requires_tool(**recipeID**, **toolID**)
Has_ingredient(**userID**, **ingredientID**)

3. Functional Dependencies(FDs) and Normalization

recipeID -> recipeName, preparationTime, difficulty
recipeName -> preparationTime, difficulty
preparationTime -> difficulty
R(recipeID, recipeName, preparationTime, difficulty)
R'(recipeID, recipeName), R''(preparationTime, difficulty), R'''(recipeName, preparationTime)

userID -> userName, password
userName -> password
R(userID, userName, password)
R'(userName, password), R''(userID, userName)

stepID -> stepNumber, stepDescription
toolID -> toolName
recipeID, pictureID -> pictureTitle
pictureID -> pictureTitle
ingredientID -> ingredientName, amount, unit
authorID -> authorName
recipeID -> shareability, meatType, dessertFlavour

4. SQL DDL:

```
CREATE TABLE recipeID_Name(
recipeID INTEGER,
recipeName CHAR(20),
PRIMARY KEY (recipe ID))
```

```
CREATE TABLE preparationTime_difficulty(
preparationTime INTEGER,
difficulty, INTEGER,
PRIMARY KEY(preparationTime))

CREATE TABLE recipeName_preparationTime (
recipeName CHAR(20),
preparationTime INTEGER,
PRIMARY KEY(recipeName))

CREATE TABLE userName_password (
userName CHAR(20)
password INTEGER,
PRIMARY KEY(userName))

CREATE TABLE userID_Name (
userID INTEGER,
userName CHAR(20),
PRIMARY KEY(userID))

CREATE TABLE Appetizer (
recipeID INTEGER,
shareability CHAR(20)
PRIMARY KEY (recipeID),
FOREIGN KEY (recipeID) REFERENCES Recipe)

CREATE TABLE MainCourse (
recipeID INTEGER,
meatType CHAR(20)
PRIMARY KEY (recipeID),
FOREIGN KEY (recipeID) REFERENCES Recipe)

CREATE TABLE Dessert (
recipeID INTEGER,
dessertFlavour CHAR(20),
PRIMARY KEY (recipeID),
FOREIGN KEY (recipeID) REFERENCES Recipe)

CREATE TABLE Step_Has(
stepID INTEGER,
stepNumber INTEGER,
stepDescription CHAR(80),
recipeID INTEGER,
PRIMARY KEY (stepID),
```

```
FOREIGN KEY (recipeID) REFERENCES Recipe
ON DELETE CASCADE
ON UPDATE CASCADE)

CREATE TABLE Tool (
toodID INTEGER,
toolName CHAR(20)
PRIMARY KEY (tooID),
UNIQUE (toolName))

CREATE TABLE Picture_Contains(
pictureID INTEGER,
pictureTitle CHAR(20),
recipeID INTEGER NOT NULL,
PRIMARY KEY (pictureID, recipeID),
FOREIGN KEY (recipeID) REFERENCES Recipe
ON DELETE CASCADE)

CREATE TABLE Ingredient (
ingredientID INTEGER,
ingredientName CHAR(20),
amount INTEGER,
unit CHAR(20),
PRIMARY KEY (ingredientID))

CREATE TABLE Author (
authorID INTEGER,
authorName CHAR(20),
PRIMARY KEY (authorID))

CREATE TABLE Has (
recipeID INTEGER,
ingredientID INTEGER,
PRIMARY KEY (recipeID, ingredientID),
FOREIGN KEY (userID) REFERENCES User,
FOREIGN KEY (recipeID) REFERENCES Recipe)

CREATE TABLE Has_ingredient (
userID INTEGER,
ingredientID INTEGER,
PRIMARY KEY (userID, ingredientID),
FOREIGN KEY (userID) REFERENCES User,
FOREIGN KEY (ingredientID) REFERENCES Ingredient)
```

```
CREATE TABLE Requires_tool (
recipeID INTEGER,
toolID INTEGER,
PRIMARY KEY (recipeID, toolID),
FOREIGN KEY (toolID) REFERENCES Tool,
FOREIGN KEY (recipeID) REFERENCES Recipe)

CREATE TABLE Requires (
recipeID INTEGER,
ingredientID INTEGER,
PRIMARY KEY (recipeID, ingredientID),
FOREIGN KEY (ingredientID) REFERENCES Ingredient,
FOREIGN KEY (recipeID) REFERENCES Recipe)
```

6. Populate each table with 5 tuples

recipeID_Name

recipeID	recipeName
123	Bread
456	Salad
789	Burger
101	Ice cream
112	Cake

preparationTime
_difficulty

preparationTime	difficulty
60	7
10	1
30	4
20	4
120	9

recipeName_prepar
ationTime

recipeName	preparationTime
Bread	60
Salad	10
Burger	30
Ice cream	20
Cake	120

userName_pass
word

userName	password
woojin	123456
latsyrc5	100000
zx7cn	654321
vivii	567890
zhanginc	234567

userID_Name

userID	userName
11111111	woojin
11111112	latsyrc5
11111113	zx7cn
12345678	vivii
23456789	zhanginc

Ingredient

ingredientID	ingredientName	amount	unit
groundBeef	Ground beef	4	ounces
pickle	Pickle	2	slices
lettuce	Lettuce	1	count
buns	Buns	1	count
vanillaExtract	Vanilla Extract	1	teaspoon

Tool

toolID	toolName
1234	Fork
2345	Spoon
3456	Measuring Spoon
4567	Knife
5678	Grater

Picture_Contains

pictureID	recipeID	pictureTitle
1234	123	Bread
2345	456	Salad
3456	789	Burger
4567	101	Ice cream
5678	112	Cake

Author

authorID	authorName
woojin	Chris
latsyrc5	Crystal

zx7cn	Sherry
vivii	Vivian
zhanginc	Grace

Has

userID	recipeID
11111111	123
11111112	456
11111113	789
12345678	101
23456789	112

Requires

recipeID	ingredientID
123	1234
456	2345
789	3456
101	4567
112	5678

Requires_tool

recipeID	toolID
123	1234
456	2345
789	3456
101	4567
112	5678

Has_ingredient

userID	ingredientID
11111111	1234
11111112	4567
11111113	7890
12345678	2345
23456789	3456

Dessert

recipeID	desertFlavour
123	Strawberry
456	Pineapple
789	Vanilla
234	Chocolate
345	Mango

Appetizer

recipeID	shareability
123	Shareable
456	Shareable
789	Shareable
234	Not shareable
345	Not shareable

MainCourse

recipeID	meatType
123	Chicken
456	Vegan

789	Beef
234	Pork
345	Fish