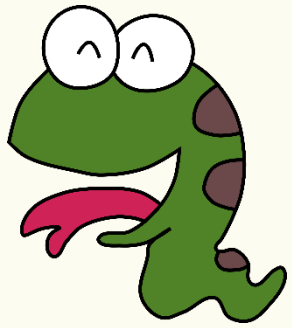
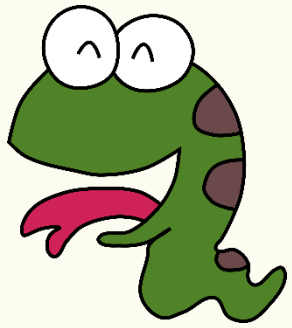


Python Programming

We will be starting shortly

In the meantime, it's all about the 90's today!

Unfortunately we had technical issues today with the music ☹ Hopefully you can enjoy this next week!



Python Programming

Warning!

We will start recording this session now!

Also, any messages in the text chat will remain on MS Teams even after the session

Quiz

Why are snakes hard to trick?

They have no legs to pull.

Coursework 1

Feedback by tomorrow

All good

Some failed my meanest test case

Some infinite loops

Coursework 2

Deadline on Thursday 7pm

Coursework 2 (Typo)

2.2 Task 2: Implementing the `NeighbourGraphBuilder` class

Now that you have your `TubeMap` instance, you will be able to compute the shortest path from one station to another. For this, you will need to know which stations are connected to each other. You already have this information from the `connections` attribute in `TubeMap` from earlier. You should now encode and index this information into a graph data structure to make it easier for you to compute the shortest path later.

For your second task, complete the `NeighbourGraphBuilder` class in `network/graph.py`.

The class must have a `build()` method as a minimum. The method takes a `TubeMap` instance as input. It returns a nested `dict` representing the graph, or an empty `dict` if the input is invalid.

The nested `dict` is like a 2D grid, except that the indices are the station `ids` of two neighbouring stations (these are strings). The value of the `dict` is a list of `Connection` instances taken from `TubeMap.connections`. Examples are provided in the documentation in `network/graph.py`.

Important note: We assume that the connection between stations is bidirectional. For example, if *Baker Street* station (id `"11"`) and *Marylebone* station (id `"163"`) are connected, then you should set the value of both `graph["11"]["163"]` and `graph["163"]["11"]` to the same list of `Connection` instances between the two stations.

Coursework 2 (Docstring is correct)

```
For instance, knowing that the id of "Hammersmith" station is "110",
graph['110'] should be equal to:

{
  '17': [
    Connection(Hammersmith<->Barons Court, District Line, 1),
    Connection(Hammersmith<->Barons Court, Piccadilly Line, 2)
  ],
  '209': [
    Connection(Hammersmith<->Ravenscourt Park, District Line, 2)
  ],
  '101': [
    Connection(Goldhawk Road<->Hammersmith, Hammersmith & City Line, 2)
  ]
}
```

Course Materials

Some time this week: Lesson 10

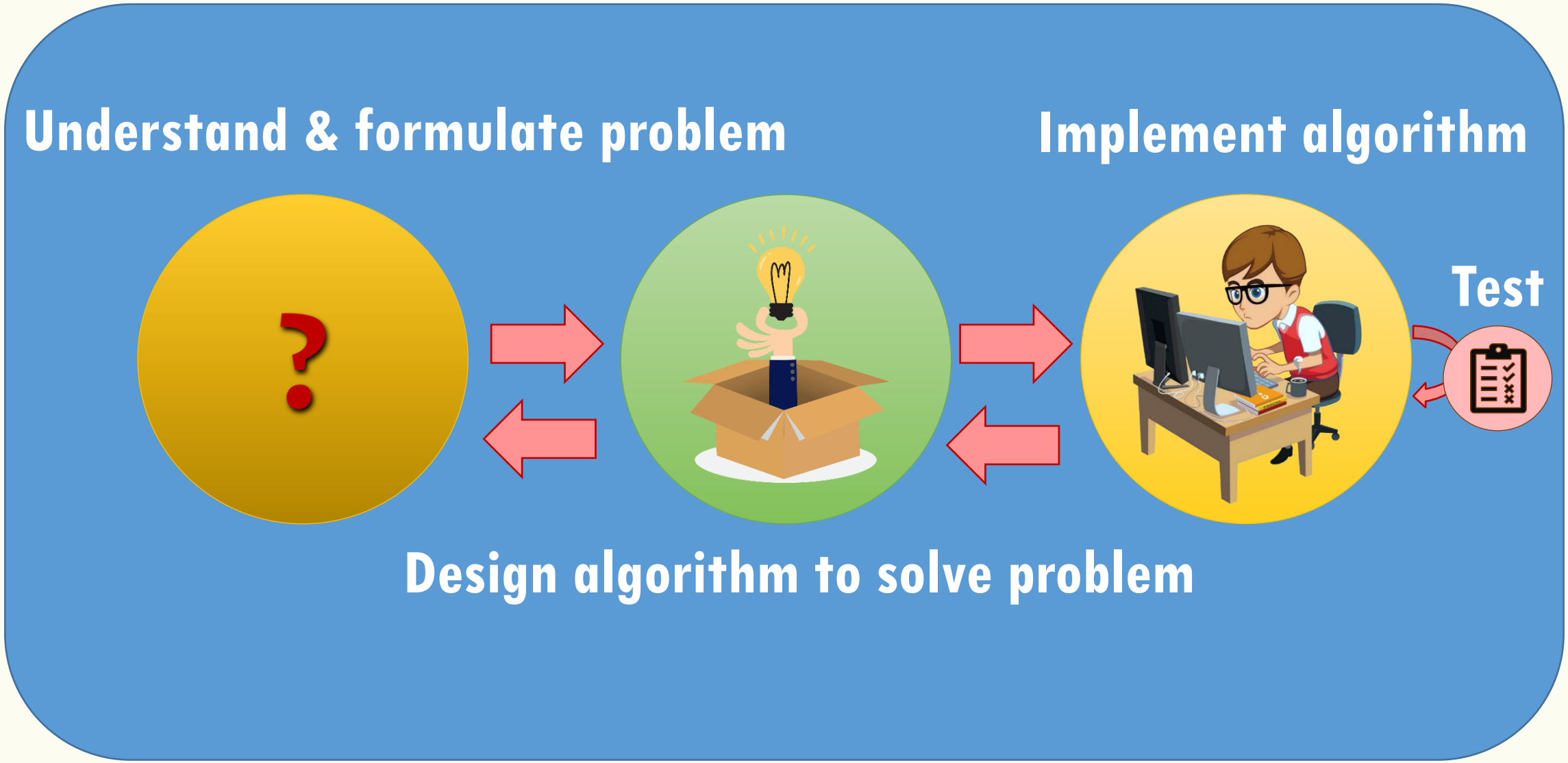
Next week: NumPy, scikitlearn, pandas

Coursework 3

Release: ~~29th Oct (Fri)~~ **1 Nov (Mon)**

Deadline: ~~12th Nov (Fri)~~ **15 Nov (Mon)**

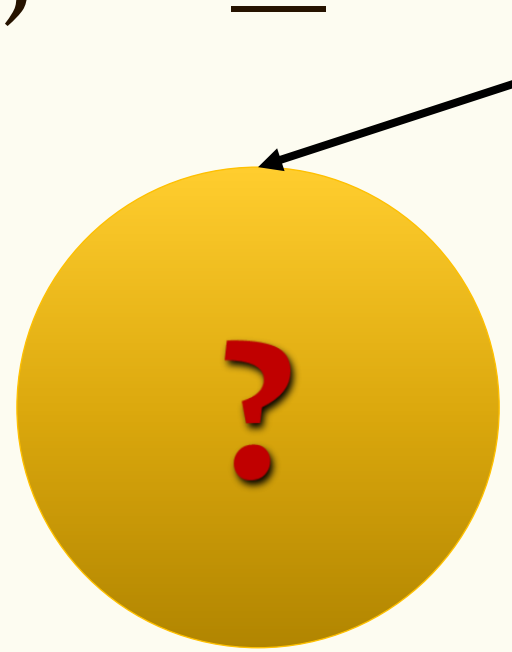
Object-Oriented Analysis and Design


Understand & formulate problem
Implement algorithm
Test
Design algorithm to solve problem

Object-Oriented Analysis and Design

Object-Oriented Analysis and Design

Object-Oriented Analysis and Design



Understand & formulate problem
(Identify objects and relations)

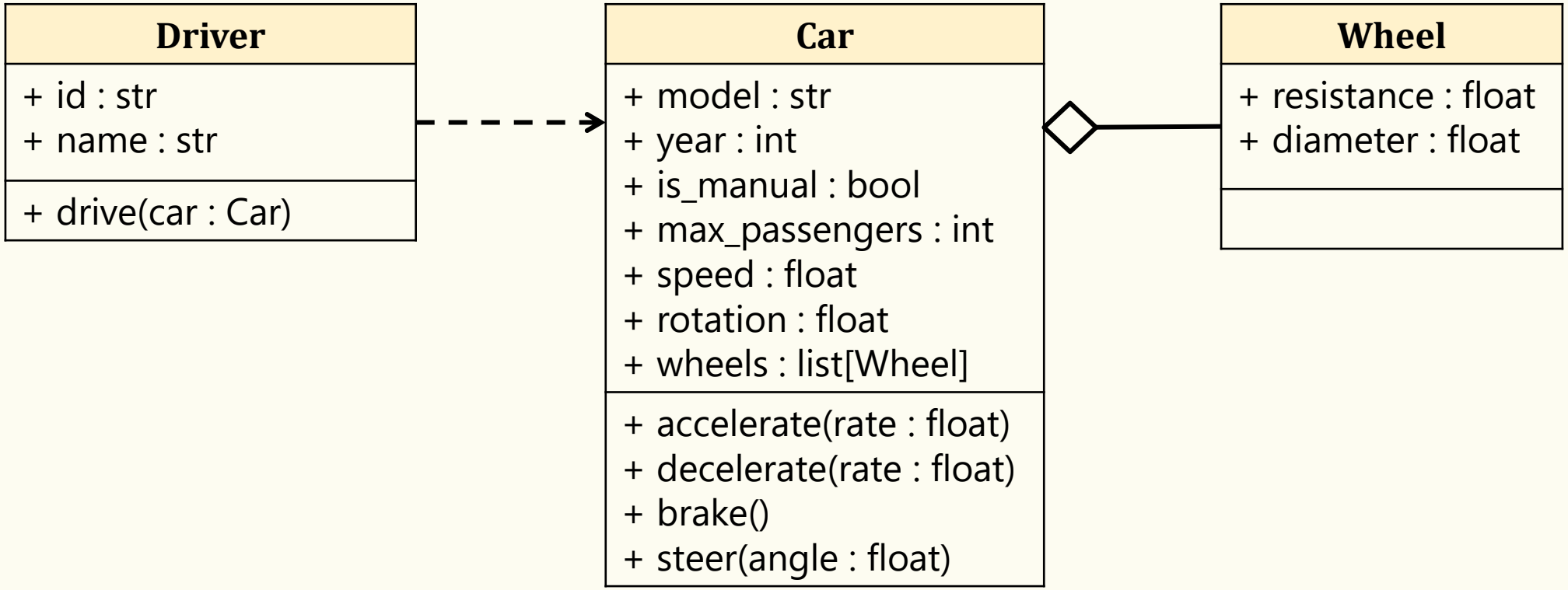
Object-Oriented Analysis and Design

Understand & formulate problem
(Identify objects and relations)

Design ~~algorithm~~ to solve problem
classes and interactions

United Modelling Language (UML)

- Lots of diagrams!
- Focus on class diagrams



Group work

Perform OOAD given a scenario

- You are developing an online shopping app for a client.
- The client sells many different products. The products might be sold at a price that might change at any point (sales!)
- The client would like to be able to also show the original list price alongside the current sale price (you know, to entice customers)!

Any potential objects (and attributes)?

- You are developing an online shopping app for a client.
- The client sells many different **product**s. The products might be sold at a *price* that might change at any point (sales!)
- The client would like to be able to also show the original list price alongside the current sale price (you know, to entice customers)!

Any potential objects (and attributes)?

- Each customer will be assigned their own shopping cart. Customers should be able to retrieve the content of their shopping cart (the products and quantity) when they log in from any computer. They can add and delete products or update the quantities at any point until they check out.
- Upon checking out, the system will create a new order with an initial ‘confirmed’ state. For simplicity, you can assume that all payment has automatically been cleared when the customer checks out

- When the order has been prepared (the `ready for dispatch` state), it will generate a shipment with an initial estimated shipment date and an estimated arrival date. Once the order has been dispatched, the system should update the shipment date and estimated arrival date and set the order status to `dispatched'.

https://python.pages.doc.ic.ac.uk/2021/lessons/ooadlive/specs.html

Group work

Design, discuss, and give me a class diagram

Collaborative

https://miro.com/

https://creately.com

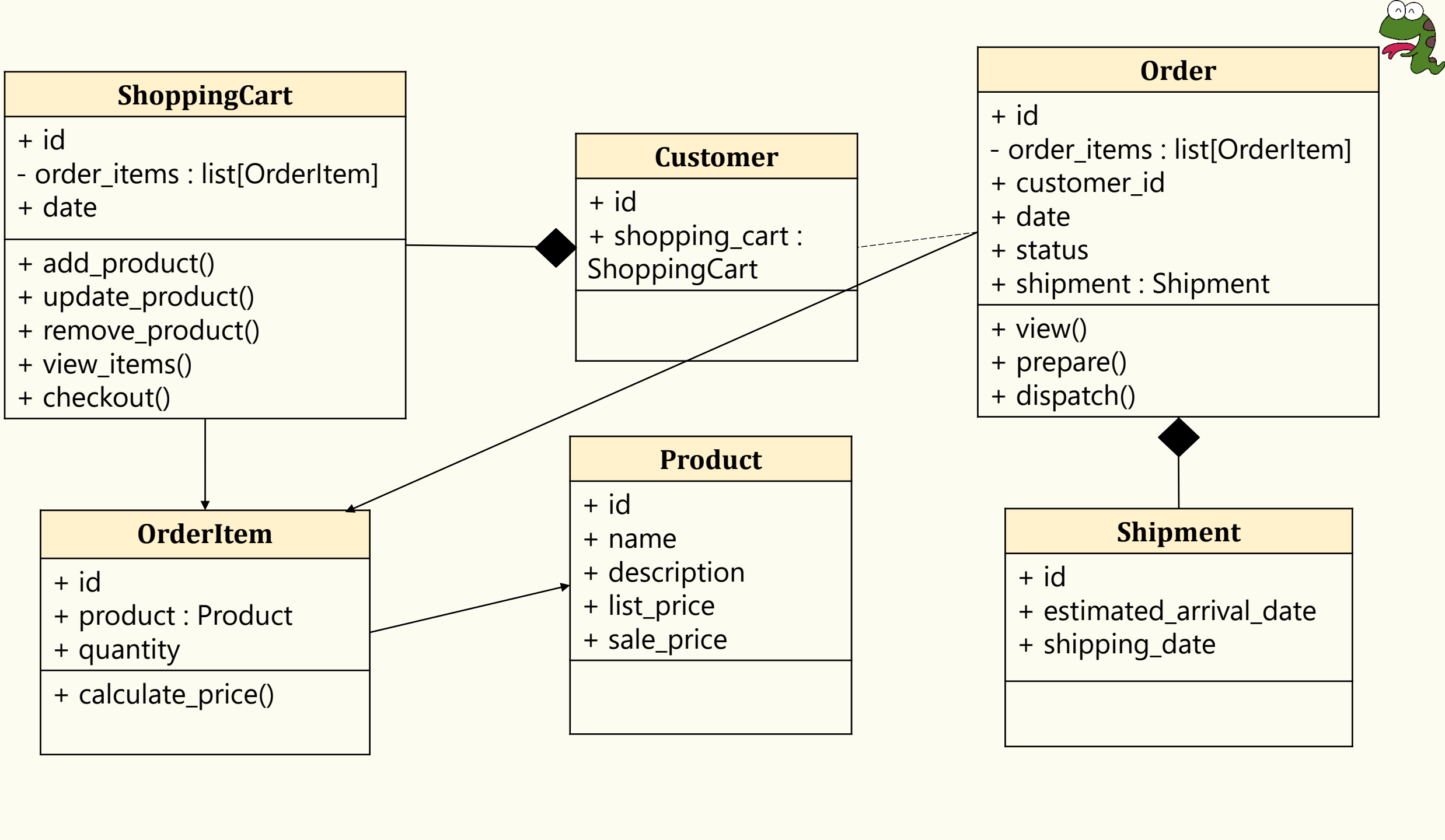
https://drive.draw.io/ (Need to share via Google)

https://www.lucidchart.com/pages/examples/uml_diagram_tool

Individual

https://yuml.me (not drag and drop)

https://staruml.io (Downloadable)


ShoppingCart
+ id
- order_items : list[OrderItem]
+ date
+ add_product()
+ update_product()
+ remove_product()
+ view_items()
+ checkout()
Customer
+ id
+ shopping_cart : ShoppingCart
Order
+ id
- order_items : list[OrderItem]
+ customer_id
+ date
+ status
+ shipment : Shipment
+ view()
+ prepare()
+ dispatch()
OrderItem
+ id
+ product : Product
+ quantity
+ calculate_price()
Product
+ id
+ name
+ description
+ list_price
+ sale_price
Shipment
+ id
+ estimated_arrival_date
+ shipping_date

This week's schedule

Mon 3-4pm	Mon 4-5pm	Tue 9-10am	Wed 9-10am	Thu 11am-1pm
LECTURE Online only	LAB Online only	LAB 219 + Online	LAB 219 + Online	LAB 221/225 + Online

Next week's lecture topic: Software refactoring

One on one with Josiah

Tue 26/10 (9AM)		
09:00-09:10	ae3718	Alba Espinosa Rastoll
09:10-09:20	asridi	Abir Sridi
09:20-09:30	ejb121	Elizabeth Bates
09:30-09:40	gmh21	Georgia Hughes
09:40-09:50	hl3920	Hongye Liu
09:50-10:00	jh3617	Jacob Hughes-Hallett

Wed 27/10 (9AM)		
09:00-09:10	jhc21	Jamie Couchman
09:10-09:20	lz420	Luming Zhang
09:20-09:30	mgg21	Max Greenwood
09:30-09:40	mc821	Mun Fai Chan
09:40-09:50	mo220	Mathilde Outters
09:50-10:00	qh116	Qi Huang

Thu 28/10 (11AM)		
11:00-11:10	sd721	Shay Divald
11:10-11:20	sp21	Spyros Ploussiou
11:20-11:30	st321	Sofiya Toteva
11:30-11:40	tth21	Tilman Hisarli
11:40-11:50	vwc21	Venus Cheung
11:50-12:00	wc1021	Wei Jie Chua
12:00-12:10	wt421	Wan Hee Tang
12:10-12:20	xz12918	Xuanjia Zhang
12:20-12:30	yl7720	Yikang Li
12:30-12:40	yy3219	Charlize Yang

One on one with Josiah

- By appointment
  - this week Mon 4-5pm and any other available slots
  - https://app.harmonizely.com/josiah-wang/python

Any feedback for us?

- https://www.menti.com/7qxudnnc3i
- Or go to www.menti.com and enter **1011 6313**