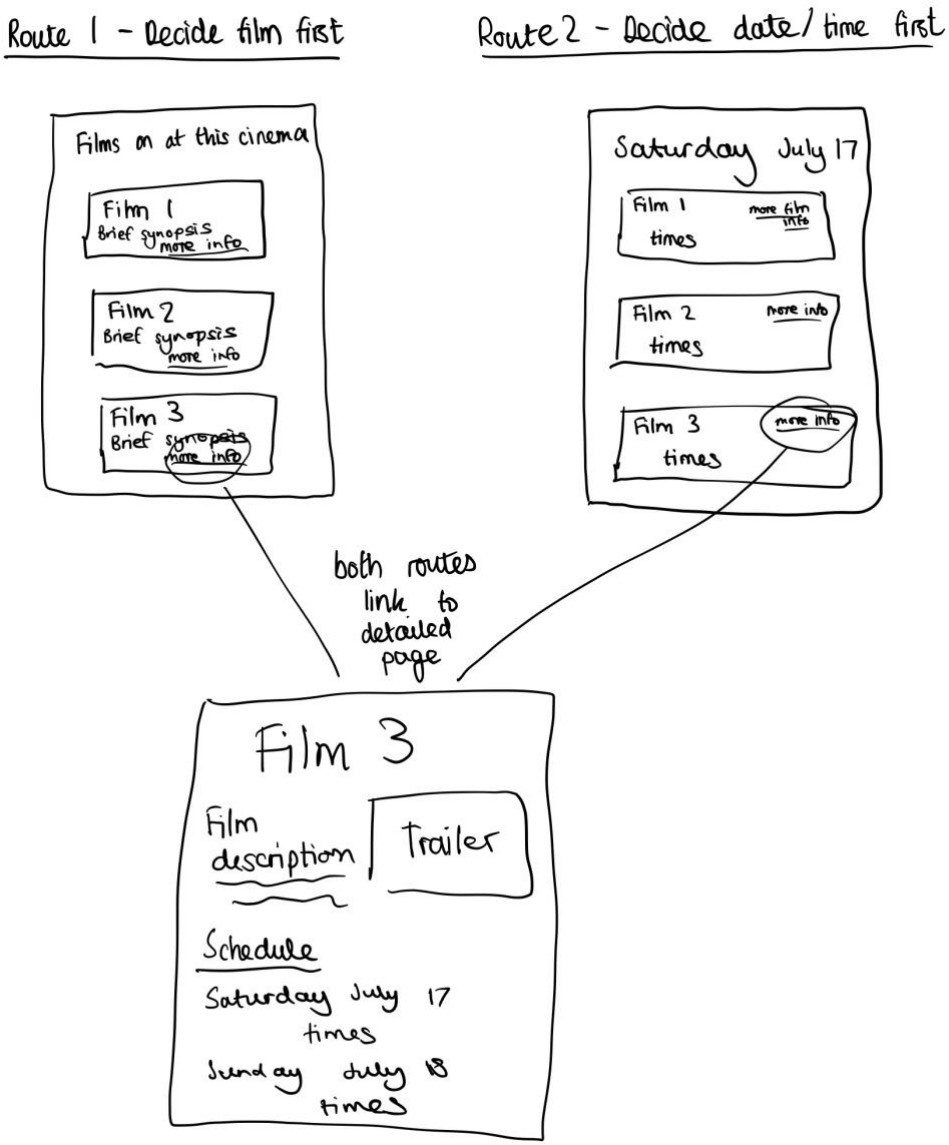
Homework Lesson 14—Process Flow Design

Design a cinema booking system. Think how you would approach the problem and what are potential ways of solving it? You do not need to write actual code, but describe the high-level approach:

- Draw a list of key requirements
- What are your main considerations?
- What would be your common or biggest problems?
- What components or tools would you potentially use?
- You are welcome to draw a diagram (a very simple one) for the process flow to explain how it is going to work.

There are two routes the user could go down when looking to book a trip to the cinema. They will either want to watch a particular film and be looking for a date and time for it (route 1) or they will want to go to the cinema on a particular day (and maybe at a particular time, e.g. evening) and find out what films are showing then (route 2). Therefore, the booking system must provide two user routes:



Key requirements

1. The booking system must **provide information** on the film schedule at a particular cinema. Based on the two user routes above, the booking system must provide:
    - An option to select a film from a list of those being shown at the cinema
    - An option to select a film from a list of those being shown on a particular day
    - Detailed information and schedule for each film
2. Once a user has selected the film and time, they must be able to **select ticket type and quantity**. Information on **pricing** should be provided at this stage too.
3. It must provide a **payment system** that allows the user to pay for their selected film viewing online.
4. The booking process needs to finish with a **confirmation** page and send an email to the user too.
5. There needs to be a way for the user to **access tickets** after booking. They could be sent in the confirmation email or there could be user account section within the booking platform that stores their tickets.
6. The booking system should be available as **a web page** and as **a mobile app**. As lots of people might be out already (e.g. at dinner) when they decide to go to the cinema.
7. If the cinema is a chain, it should provide an option to select which branch they want to visit. This could also be done with a **GPS location** component that will help them find the nearest one.

Main considerations and problems

- Is it a chain of cinemas or a single independent cinema? If it is a chain, there will need to be an option to select which branch.
- Where are the users when they book? The app should be both web based and a mobile app to cover as many users as possible. Knowing where the user is can also help to find the closest branch if it is a chain.
- The system needs to allow numerous people to be making bookings at once.
- The system will need to be available all the time but it is not so important overnight from around midnight to the early morning.
- Need to decide if the cinema seats are allocated at booking. In this case there needs to be some sort of concurrency control so that seats are held by a customer until the booking is complete. Otherwise, need to make sure a film screening can't be overbooked.
- Need to make sure customer details and payment information are secure and that the system meets legal and ethical requirements.
- Need to make sure the user interface is accessible. For example, it needs to be able to be read by screen readers and colours need to be suitable, e.g. can be viewed by people with colour-blindness, don't induce migraines etc.
- System must always display up to date (and time) information. We wouldn't want it to be showing film times that have already passed.
- Need to consider how to handle proof of age as films are age rated. Will this just be done in the cinema or is this something that could be built into the booking system?
- Need to consider how to handle proof for discounts, e.g. will it accept some sort of student id or system like Unidays for student discount.

Components and tools

- Front end user interface that is a pleasure to use on all screen sizes (don't want customers going elsewhere)
- Back-end logic and API with Python

- Database containing film schedule, film details, pricing information, customer account details.
- GPS to locate user and find their nearest branch.
- Machine learning could be used to suggest a film a user might be interested in.