

The Oyster Card Problem

You are required to model the following fare card system which is a limited version of London's Oyster card system. At the end of the test, you should be able to demonstrate a user loading a card with £30, and taking the following trips, and then viewing the balance.

- Tube Holborn to Earl's Court
- 328 bus from Earl's Court to Chelsea
- Tube Earl's court to Hammersmith

Operation

When the user passes through the inward barrier at the station, their oyster card is charged the maximum fare.

When they pass out of the barrier at the exit station, the fare is calculated and the maximum fare transaction removed and replaced with the real transaction (in this way, if the user doesn't swipe out, they are charged the maximum fare).

All bus journeys are charged at the same price.

The system should favor the customer where more than one fare is possible for a given journey.

E.g., Holborn to Earl's Court is charged at £2.50.

For the purposes of this test using the following data:

Stations and zones

Station Zone(s)

Holborn 1
Earl's Court 1, 2
Wimbledon 3
Hammersmith 2

Fares

Journey Fare

Anywhere in Zone 1 £2.50
Anyone zone outside zone 1 £2.00
Any two zones including zone 1 £3.00
Any two zones excluding zone 1 £2.25
Any three zones £3.20
Any bus journey £1.80
The maximum possible fare is therefore £3.20.