Cinema Problem

Alison's cinema has 100 seats.
One day, Alison notices that her cinema is full, and she has taken exactly £100.

The prices were:

Adults £3.50
Pensioners £1.00
Children £0.85

She knows that not everyone in the audience was a pensioner.

How many adults, pensioners and children were present?

Can there be 100 people and takings of exactly £100 if the prices are:

Adults £4.00
Pensioners £1.00
Children £0.50

What if the prices are:

Adults £5.00
Pensioners £2.50
Children £0.50

Here are some questions you might like to consider:

- How many solutions are there for each set of prices?
- If I can find one solution, can I use it to help me find all the other solutions?
- Can you find alternative sets of prices that offer many solutions?
- What about exactly one solution?
- If a children's film has an audience of 3 children for every adult (no pensioners), how could the prices be set to take exactly £100 when all the seats are sold?
- What about a family film where adults, children and pensioners come along in the ratio 2:2:1?