

SINGAPORE AIRLINES Case Study 1: *Scheduling Aircraft*

Running a commercial airline is a highly complex business: you not only require efficient utilisation of your aircraft (each one is a multi-million pound investment), but also need to fill each plane with passengers and have sufficient crew members (whose working hours are strictly monitored). A Boeing 747 with Singapore Airlines, for example, requires a total crew of about 18 people to fly the plane and look after the passengers on a long distance journey.

As an example, consider the Singapore-London route. The journey time, on average, is

Singapore-London : 13 hours 35 minutes

London-Singapore : 13 hours

(the difference in times is due to the prevailing westerly winds round the globe).

Problem 1

In September, Flight No. SQ320 leaves Singapore at 12.30 hours, *local time*. At what time will it arrive at London, *local time*, given that Singapore time is 7 hours ahead of London time?

Problem 2

Here are some possible departure times for flights from Singapore to London. Copy and complete the table, filling in the missing times.

Singapore (<i>local time</i>) departs	07.30	10.00	12.30	15.00	17.30	20.00	22.30
London (<i>local time</i>) arrives	?	?	?	?	?	?	?

Problem 3

Suppose the airline has decided to run 3 daily flights from Singapore to London.

Design a possible schedule that gives convenient departure and arrival times for passengers.

Problem 4

Each plane requires at least 3 hours at each airport, for disembarking, cleaning, refuelling, passenger boarding and luggage loading.

(a) Design a possible complete schedule for

Singapore-London-Singapore

for three daily services each day of the week, in each direction. How many planes are needed to cover this schedule?

(b) Design a possible schedule using only four planes.

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In practice, each plane is not used exclusively for one specific route; a *Singapore-London-Singapore* plane might go to another destination on its next flight from Singapore.

Problem 5

You have 12 planes to allocate exclusively on Singapore to Europe services in September. Possible destinations and flying times are given in the table below.

<i>Destination</i>	<i>Flying time</i>		<i>Time difference from Singapore</i>
	<i>from Singapore</i>	<i>to Singapore</i>	
Amsterdam	13 h 15 m	12 h 35 m	– 6 h
Frankfurt	13 h	12 h 25 m	– 6 h
London	13 h 35 m	13 h	– 7 h
Paris	13 h 25 m	12 h 30 m	– 6 h
Zurich	13 h	12 h 15 m	– 6 h

Design a suitable weekly schedule for these planes, taking into account the likely passenger demand for each destination.