

14.24 Yield management

Numbers of seats have been rounded to nearest integers where necessary.

Period 1

Sell tickets at the following prices up to what is available:

First	£1200
Business	£900
Economy	£500

Set provisional prices for period 2:

First	£1150 if scenario 1 in period 1 £1150 if scenario 2 in period 1 £1300 if scenario 3 in period 1
Business	£1100 for all scenarios in period 1
Economy	£700 for all scenarios in period 1

Set provisional prices for period 3:

First	£1500 for all scenarios in periods 1 and 2
Business	£800 for all scenarios in periods 1 and 2
Economy	£480 for all scenarios in period 1 and scenarios 1 and 2 in period 2; £450 for all scenarios in period 1 and scenario 3 in period 2

(Provisionally) book three planes. Expected revenue is £169 544.

Period 2

Rerunning the model with the demand given (with hindsight) for the price levels decided for period 1 results in the following recommended decisions for period 2.

Sell tickets at the following prices up to what is available:

First	£1150
Business	£1100
Economy	£700

Set provisional prices for period 3:

First	£1500 for all scenarios in period 2
Business	£800 for all scenarios in period 2
Economy	£480 for scenarios 1 and 2 in period 2 £450 for scenario 3 in period 2

(Provisionally) still book three planes. Expected total revenue is now £172 969.

Period 3

Rerunning the model with the known demands and price levels for periods 1 and 2 results in the following recommended decisions for period 3.

Sell tickets at the following prices up to what is available:

First	£1500
Business	£800
Economy	£480

(Provisionally) still book three planes. Expected total revenue is now £176 392.

Solution

The resultant solution at take-off (using demands during the final week) will therefore be:

Period 1

First Class	25 seats sold at £1200: Yield £30 000
Business Class	45 seats sold at £900: Yield £40 500
Economy Class	50 seats sold at £500: Yield £25 000

Period 2

First Class	50 seats sold at £1150: Yield £57 500
Business Class	45 seats sold at £1100: Yield £49 500
Economy Class	50 seats sold at £700: Yield £35 000

Period 3

First Class	40 seats sold at £1500: Yield £60 000
Business Class	25 seats sold at £800: Yield £20 000
Economy Class	36 seats sold at £480: Yield £17 280

Three planes will be needed. Total yield (subtracting the costs of the planes) will therefore be £184 780.

It will be necessary to reallocate four seats from Business to First Class and five seats from Economy to Business Class.

If the model is altered to maximize yield subject to expected demand (without recourse), the resultant solution (allowing for the given demands falling below those expected) is:

Period 1

First Class	24 seats sold at £1200: Yield £28 800
Business Class	39 seats sold at £900: Yield £35 100
Economy Class	50 seats sold at £500: Yield £25 000

Period 2

First Class	55 seats sold at £1150: Yield £63 250
Business Class	43 seats sold at £1100: Yield £47 300
Economy Class	49 seats sold at £700: Yield £34 300

Period 3

First Class	34 seats sold at £0.1500: Yield £51 000
Business Class	35 seats sold at £800: Yield £28 000
Economy Class	37 seats sold at £480: Yield £17 760

Three planes are needed. Total yield is £180 210.

This can clearly be improved by, in the last period, ‘topping-up’ to fill vacant capacity in the most beneficial way, that is, selling 39 Economy Class instead of 37, so filling the three planes.

This increases yield to £181 170, which is still considerably short of the yield produced by running the Stochastic Program with recourse.