

Decision Management Community's Challenge Feb-2025

"Mr Bates vs The Post Office"

A solution with OpenRules Rule Solver

This challenge is described at <https://dmcommunity.org/challenge/challenge-feb-2025/>:

Challenge Feb-2025

Mr Bates vs The Post Office

[Solutions](#)

The Post Office in DS City has come up with a new measure to limit packages that can be sent under a new flat rate, regardless of weight or volume. The “strap measure” of a box is the length of the longest side plus two times the sum of the two shorter sides. For the new flat rate for sending a packet, the strap measure may not exceed 100 inches.



Your e-commerce client Mr. Bates sells large comforters of 9,000 cubic inches in volume and wants to make use of this new flat rate if possible. Can you design a box that will be large enough to hold these comforters and that can be sent at a flat rate price? Source: [InsideOpt](#)

OpenRules Decision Model

As usual with [Rule Solver](#), we start with the Glossary:

Glossary glossary					
Variables	Business Concept	Attribute	Type	Domain	Used As
Strap Measure Max	PostOffice	StrapMeasureMax	int		in
Requested Volume		requestedVolume	int		in
LongSide		longSide	int	VarDomain	
ShortSide1		shortSide1	int		
ShortSide2		shortSide2	int		
Volume		volume	int		out,objective
VarDomain	:=	"1-" + \${Strap Measure Max}	String		const

It defines 3 unknown decision variables LongSide, ShortSide1, and ShortSide2.

Here are two main tables “Define” and “Solve”:

Decision Define
ActionExecute
Decision Tables
DefineVariables
PostConstraints

Decision Solve
ActionExecute
Actions
SetObjective
SolverMinimize
SolverLogSolution

This table defines an unknown decision variable “Volume”:

Decision DefineVariables
SolverDefineVariables
Variable Expression
"Volume" LongSide * ShortSide1 * ShortSide2

Then we post constraints:

Decision PostConstraints
SolverPostConstraints
Constraint Expression
LongSide >= ShortSide1
LongSide >= ShortSide2
LongSide + 2*(ShortSide1 + ShortSide2) <= `Strap Measure Max`
Volume >= `Requested Volume`

And finally, we define the objective “Volume” which we want to minimize under posted constraints:

Decision SetObjective
SolverSetObjective
Objective
"Volume"

To run this decision model, we add the proper test data:

DecisionTest testCases		
#	Define	Define
Test	Strap Measure Max	Requested Volume
1	100	9,000

After executing this decision model, we received the following results:

```
ShortSide1[15]
ShortSide2[15]
LongSide[40]
Volume[9000]
```

Thus, Mr. Bates may get a flat rate using the box 40 x 15 x 15 with a volume of 9000.