4.1 Box-counting dimension

a)

```
In[ ]:= (*Define the object and determine its size at different scales*)
object = {{{1, 2}, {3, 4}}, {{5, 6}, {7, 8}}};
scaleFactor = 3;
(*Count the number of boxes*)numBoxes = Length[object] * Length[object];

(*Calculate the dimension using the formula:dimension=
 log(number of boxes)/log(scale factor)*)
dimension = Log[numBoxes] / Log[scaleFactor];

(*Print the result*)
Print[dimension]
```

$$\frac{\text{Log}[4]}{\text{Log}[3]}$$