



Least Number of Envelopes

I'm going to hand you one thousand dollars, in one-dollar bills. Your job is to put all 1000 of the dollar bills in the envelopes in such a way that no matter what number of dollars I ask you for, you'll be able to hand me the appropriate combination of envelopes.

For example, if you put 500 in one envelope and 500 in another and I asked you for \$500.00, you would give me one envelope; great! But if I asked you for \$501.00 we would be out of luck! You don't have a combination of envelopes that when added together would equal \$501.00

The question is, what's the fewest number of envelopes you would need, and how much money do you put in each one so that you could give me a combination of envelopes that would equal any dollar amount I asked for from 1 - 1000?

After solving the problem, scroll down for the solution

In the first nine envelopes, you're going to put:

1
2
4
8
16
32
64
128
256

If you add all those up, that's 511 dollars.

So if I ask you for any amount up to 511 dollars, you would give me some combination of those envelopes, and if I asked you for 511, I'd give you all of them.

In the next envelope I would put 489 bucks. And if you do that, you can give me any amount of money that I ask for. For example, if I ask for say, 671 dollars, you would give me the envelope that's 489 dollars, plus you'd give me another 182 dollars. But we know that you can give me 182 dollars.

You could do that combination with the other envelopes

Envelope 1: 1
Envelope 2: 2
Envelope 3: 4
Envelope 4: 8
Envelope 5: 16
Envelope 6: 32
Envelope 7: 64
Envelope 8: 128
Envelope 9: 256
Envelope 10: 489