# Potter Kata

**Problem Description**

Once upon a time there was a series of 5 books about a very English hero called Harry. (At least when this Kata was invented, there were only 5. Since then they have multiplied).

Children all over the world thought he was fantastic, and, of course, so did the publisher. So in a gesture of immense generosity to mankind, (and to increase sales) they set up the following pricing model to take advantage of Harry's magical powers.

One copy of any of the five books costs £8. If, however, you buy two different books from the series, you get a 5% discount on those two books. If you buy 3 different books, you get a 10% discount. With 4 different books, you get a 20% discount. If you go the whole hog, and buy all 5, you get a huge 25% discount.

Note that if you buy, say, four books, of which 3 are different titles, you get a 10% discount on the 3 that form part of a set, but the fourth book still costs £8.

Potter mania is sweeping the country and parents of teenagers everywhere are queuing up with shopping baskets overflowing with Potter books. Your mission is to write a piece of code to calculate the price of any conceivable shopping basket, giving as big a discount as possible.

For example, how much does this basket of books cost?

2 copies of the first book

2 copies of the second book

2 copies of the third book

1 copy of the fourth book

1 copy of the fifth book

(answer: £51.20)

**Clues**

You’ll find that this Kata is easy at the start. You can get going with tests for baskets of 0 books, 1 book, 2 identical books, 2 different books… and it is not too difficult to work in small steps and gradually introduce complexity.

However, the twist becomes apparent when you sit down and work out how much you think the sample basket above should cost. It isn’t 5\*8\*0.75+3\*8\*0.90. It is in fact 4\*8\*0.8+4\*8\*0.8. So the trick with this Kata is not that the acceptance test you’ve been given is wrong. The trick is that you have to write some code that is intelligent enough to notice that two sets of four books is cheaper than a set of five and a set of three.

**Suggested Test Cases**

(Originally posted at xp-france.net/cgi-bin/wiki.pl?[KataPotter](http://www.codingdojo.org/cgi-bin/index.pl?KataPotter))

def testBasics

assert\_equal(0, price([]))

assert\_equal(8, price([0]))

assert\_equal(8, price([1]))

assert\_equal(8, price([2]))

assert\_equal(8, price([3]))

assert\_equal(8, price([4]))

assert\_equal(8 \* 2, price([0, 0]))

assert\_equal(8 \* 3, price([1, 1, 1]))

end

def testSimpleDiscounts

assert\_equal(8 \* 2 \* 0.95, price([0, 1]))

assert\_equal(8 \* 3 \* 0.9, price([0, 2, 4]))

assert\_equal(8 \* 4 \* 0.8, price([0, 1, 2, 4]))

assert\_equal(8 \* 5 \* 0.75, price([0, 1, 2, 3, 4]))

end

def testSeveralDiscounts

assert\_equal(8 + (8 \* 2 \* 0.95), price([0, 0, 1]))

assert\_equal(2 \* (8 \* 2 \* 0.95), price([0, 0, 1, 1]))

assert\_equal((8 \* 4 \* 0.8) + (8 \* 2 \* 0.95), price([0, 0, 1, 2, 2, 3]))

assert\_equal(8 + (8 \* 5 \* 0.75), price([0, 1, 1, 2, 3, 4]))

end

def testEdgeCases

assert\_equal(2 \* (8 \* 4 \* 0.8), price([0, 0, 1, 1, 2, 2, 3, 4]))

assert\_equal(3 \* (8 \* 5 \* 0.75) + 2 \* (8 \* 4 \* 0.8),

price([0, 0, 0, 0, 0,

1, 1, 1, 1, 1,

2, 2, 2, 2,

3, 3, 3, 3, 3,

4, 4, 4, 4]))

end