Code Challenge

Discount calculator

Parameters

Time limit
3 hours, *not* including time to initialize the project and install any dependencies

Language
TypeScript

Format
Provide the code either zipped up (without Node modules) and attached to an email or as a GitHub repository. Please include instructions how to run tests and how to execute the application.

Criteria
- Is the code readable and easy to understand?
- Do the unit tests sufficiently cover edge cases?
- Is the commit history sensible?
- Are there comments clearly explaining the developer's rationale?
Note: Well-written code is more important than correctness.

Problem

To try and encourage more sales from a popular 5-piece fashion collection, a store owner has decided to offer discounts for customers that buy multiple shirts.

One of any of the five shirts costs $8.

If, however, you buy two different shirts, you get a 5% discount on those two shirts.

If you buy 3 different shirts, you get a 10% discount.

If you buy 4 different shirts, you get a 20% discount.

If you buy all 5, you get a 25% discount.

Note that if you buy four shirts, of which 3 are different, you get a 10% discount on the 3 that form part of a set, but the fourth shirt still costs $8.

Your mission is to write a piece of code to calculate the

price of any conceivable shopping basket (containing only shirts of the same collection), giving as big a discount as possible.

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

- 2 of the first shirt
- 2 of the second shirt
- 2 of the third shirt
- 1 of the fourth shirt
- 1 of the fifth shirt

One way of grouping these 8 shirts is:

- 1 group of 5 --> 25% discount (1st,2nd,3rd,4th,5th)
- +1 group of 3 --> 10% discount (1st,2nd,3rd)

This would give a total of:

- 5 shirts at a 25% discount
- +3 shirts at a 10% discount

Resulting in:

- 5 x (8 - 2.00) == 5 x 6.00 == $30.00
- +3 x (8 - 0.80) == 3 x 7.20 == $21.60

For a total of $51.60

However, a different way to group these 8 shirts is:

- 1 group of 4 shirts --> 20% discount (1st,2nd,3rd,4th)
- +1 group of 4 shirts --> 20% discount (1st,2nd,3rd,5th)

This would give a total of:

- 4 shirts at a 20% discount
- +4 shirts at a 20% discount

Resulting in:

- 4 x (8 - 1.60) == 4 x 6.40 == $25.60
- +4 x (8 - 1.60) == 4 x 6.40 == $25.60

For a total of $51.20

And $51.20 is the price with the biggest discount.