

Helloworld Bookstore

1.0 Specification

The Hello World bookstore has set out to change their sales strategies to attract more customers before Halloween.

1.1) On the eve of the campaign, the bookstore has books in 3 categories: books in a general category, second-hand books and Halloween-themed books.

1.2) Books in a general category are € 10, second-hand books are € 5 and Halloween-themed books are € 7.5. These books have fixed prices.

1.3) Generally, customers get a 10% discount if they make a purchase of € 25 or more, a 15% discount if they make a purchase of € 45 or more, and a 20% discount if they make a purchase of € 75 or more. However, customers must purchase at least 1 Halloween-themed book to receive this discount.

1.4) If a customer buys 3 or more books in a general category, 1 Halloween book is free. (This gift book is not considered for a general discount)

1.5) If a customer buys 6 or more second-hand books, 1 Halloween book is free. (This gift book is not considered for a general discount)

1.6) 1.4 and 1.5 are invalid at the same time. However, one of them must be applied.

1.7) According to the general rules, each VIP customer receives a 2% discount on each book when they purchase books in a general category.

1.8) The percentage of the total discount cannot exceed 25%.

2.0 Test design documentation

JavaScript is called a dynamic language because it does not just have a few dynamic aspects, pretty much everything is dynamic. All variables are dynamic (both in type and existence), and even the code is dynamic. Therefore, the types of parameters entered into the **constructor** must be tested first.

2.1 constructor(books, isUserVIP)

Constructor requires two parameters (books and isUserVIP). Type of the books parameter is array and each array object requires price and category keys whilst price is non-negative number and category is string. Type of the isUserVIP parameter is boolean.

<u>category</u>	<u>price</u>	<u>isUserVIP</u>	<u>Expected result</u>
undefined	undefined	false	Books DB should be include array where length > 0
undefined	10	false	Books DB should be include category
null	undefined	false	Books DB should be include non-empty price
null	null	false	Books DB should be defined
false	1	false	Category should be string
General	undefined	false	Books DB should be include price
undefined	null	false	Books DB should be include non-empty category
General	PriceString	false	Price should be number
General	-10	false	Price should be a non-negative number
undefined	undefined	undefined	Books and price should be included
General	0	undefined	isUserVIP should be included
General	10	null	isUserVIP should be non-empty
General	0	boolean	isUserVIP should be boolean not string
General	7.5	false	Success
General	7.5	true	Success

The above tests have to check all the error messages that will occur if the constructor parameters are checked with different values.

2.2 addToCart(bookID)

First of all, booksDB should be defined. As can be seen, id of the General book is 0, Second Hand book is 1, Halloween book is 2.

```
const booksDB = [
  { category: "General", price: 10 },
  { category: "Second Hand", price: 5 },
  { category: "Halloween", price: 7.5 },
];
```

Next, items should define a books on cart. Thus, in this step, total price of books in cart and free halloween book should be verified (1.4, 1.5).

<u>items</u>	<u>Free halloween book</u>	<u>Expected result</u>
[0, 0, 0]	1	1
[1, 1, 1, 1, 1, 1]	1	1
[0, 0, 0, 1, 1, 1, 1, 1]	1	1
[0]	0	0

The above tests are generally designed to check if a book is free.

<u>items</u>	<u>Total price</u>	<u>Expected result</u>
[0, 1, 1, 1, 0, 2, 0]	52.5	Total price should be equally

items	isUserVIP	percentage
[0, 0, 0]	false	0
[0, 0, 0, 2]	false	10
[0, 0, 2, 0]	false	15
[0, 0, 2, 0, 0, 0, 0]	false	20
[1, 1, 1, 1, 1, 1, 2]	false	10
[1, 1, 1, 1, 1, 1, 1, 1, 2]	false	15
[1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2]	false	20

Items on the table aimed to reach the boundaries of the percentage limit.

2.5 getDiscountedPrice()

In this section, It is possible to see how the test found the bug. In 2.4 section, the test shows the correct percentage results, however, in this case, it is shown that the test is able to find bugs easily. This function return a discounted total price.

items	isUserVIP	Discounted price
[]	true	0
[0]	true	total - ((total*2)/100)
[0, 0, 0]	true	total - ((total*6)/100)
[0, 0, 0, 2]	true	total - ((total*16)/100)
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]	true	total - ((total*25)/100)
[]	false	0
[0, 0]	false	total
[1, 1, 1, 1, 1]	false	total
[0, 0, 0]	false	total
[1, 1, 1, 1, 1]	false	total
[0, 0, 0, 2]	false	total - ((total*10)/100)
[0, 0, 0, 2, 0]	false	total - ((total*15)/100)
[0, 0, 0, 2, 0, 0, 0, 0]	false	total - ((total*20)/100)
[1, 1, 1, 1, 1, 1, 2]	false	total - ((total*10)/100)
[1, 1, 1, 1, 1, 1, 1, 1, 2]	false	total - ((total*15)/100)
[1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2]	false	total - ((total*20)/100)

3.0 Bugs

It was necessary to enter 2 bugs into the code. The pre-defined bugs are given as follows.

3.1 Type of the price

The price of each book should not be less than zero. If the value of any book is less than zero, an error must be made inside the constructor.

3.2 Price of the free book

When three general category or six second hand category books are added to the cart, 1 free Halloween book must be added. However, the price of the book remains the same and affects the overall percentage.

4.0 Coverage report

It is difficult to achieve 100% code coverage for a large-scale project. As this project is not large-scale, one of the goals was to achieve 100% code coverage, and the result was achieved.

File	index.js
Statements	100% (56/56)
Branches	100% (42/42)
Functions	100% (5/5)
Lines	100% (47/47)