Pencil Durability Kata

The purpose of the Pencil Kata is to write code to simulate, first coarsely and then more faithfully, an ordinary graphite pencil. It includes writing and editing text, point degradation, using the eraser, and sharpening the pencil. The point of this kata to to provide a larger than trivial exercise that can be used to practice TDD. A significant portion of the effort will be in determining what tests should be written and, more importantly, written next.

Write

As a writer

I want to be able use a pencil to write text on a sheet of paper

so that I can better remember my thoughts

When the pencil is instructed to write a string of text on a sheet of paper, the paper will reflect the text that was written.

Text written by the pencil should always be appended to existing text on the paper. Thus, given a piece of paper with the text "She sells sea shells", when a pencil is instructed to write " down by the sea shore" on the paper, the paper will then contain the entire string.

Point Degradation

As a pencil manufacturer

I want writing to cause a pencil point to go dull

so that I can sell more pencils

When a pencil is created, it can be provided with a value for point durability. When the point durability is low, the pencil will be able to write only a limited number of characters before it goes dull; after it goes dull, every character it is directed to write will appear as a space. A pencil created with a high point durability will still go dull, but not as fast.

Writing spaces and newlines expends no graphite; therefore these characters should not affect the pencil point.

Lowercase letters should degrade the pencil point by a value of one, and capital letters should degrade the point by two. Hence when a pencil with a point durability of four is instructed to write the string "text", the paper will contain the entire string. But if a pencil with point durability of four is instructed to write the string "Text", the paper will only show "Tex ".

Sharpen

As a writer

I want to be able to sharpen my pencil

so that I can continue to write with it after it goes dull

When a pencil is sharpened, it regains its initial point durability and can write more characters before it goes dull again. Thus, given a pencil created with point durability of 40,000 that has since degraded, when it is sharpened, its point durability will be 40,000 again.

A pencil should also be created with an initial length value. Pencils of short length will only be sharpenable a small number of times while pencils of great length can be sharpened more times. The pencil's length is reduced by one each time it is sharpened. When a pencil's length is zero, then sharpening it no longer restores its point durabliity.

Erase

As a writer

I want to be able to erase previously written text

so that I can remove my mistakes

When the pencil is instructed to erase text from the paper, the last occurrence of that text on the paper will be replaced with empty spaces.

Given a piece of the paper containing the string:

"How much wood would a woodchuck chuck if a woodchuck could chuck wood?"

when the string "chuck" is erased, the paper should read:

"How much wood would a woodchuck chuck if a woodchuck could   wood?"

and if the string "chuck" is erased again, the paper should read:

"How much wood would a woodchuck chuck if a wood   could   wood?"

Eraser Degradation

As a pencil manufacturer

I want a pencil eraser to eventually wear out

so that I can sell more pencils

When a pencil is created, it can be provided with a value for eraser durability. For simplicity, all characters except for white space should degrade the eraser by a value of one. Text should be erased in the opposite order it was written. Once the eraser durability is zero, the eraser is worn out and can no longer erase.

Thus if a pencil's eraser has remaining durability of three, and it is instructed to erase the word "Bill" from "Buffalo Bill", then the text remaining on the paper is "Buffalo B   ".

Editing

As a writer

I want to be able edit previously written text

so that I can change my writing without starting over

Once text has been erased from the paper, a pencil may be instructed to write new text over the resulting white space. For instance, if the paper contains the text "An   a day keeps the doctor away", a pencil can can be instructed to write the word "onion" in the white space gap, so the text reads "An onion a day keeps the doctor away".

Existing text on the page cannot 'shift' to make room for new text. If the new text is longer than the allocated whitespace and thus would collide with other existing non-whitespace characters on the page, these character collisions should be represented by the "@" character. For example, writing "artichoke" in the middle of "An   a day keeps the doctor away" would result in "An artich@k@ay keeps the doctor away".