Open-Source Software Project
Assignment 1

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1 Project Description

We developed a command-line tool, `stat`, in the previous class. Let's extend its features.

2 Add the `min` command (15 pts)

In addition to the three basic commands, `sum`, `avg`, and `max`, add a new command, `min`, which returns the smallest element in the input array. Below is an example (The symbol `>` indicates the command that is entered by the user).

```
> stat min 1 2 3 4
1
> stat min 3 -5 0 2
-5
```

You must implement a function named `min` in *lib.js* as the other commands.

3 Write a test case for `min` (5 pts)

In *lib.test.js*, write at least one unit test that can check the correctness of the function `min` you added.

4 Add the `med` command (30 pts)

Add a new command, `med`, which computes the median of the input array. If the array has an odd number of elements, print out the middle element when the array is sorted. If the array has an even number of elements, print out the mean between the elements just before and after the middle point when the array is sorted. See the examples below:

```
> stat med 5 1 2 3 3
3
> stat med 1 2 4 4
3
```

In the first case, we have $[1, 2, 3, 3, 5]$ (sorted), so the middle element is 3. In the second case, we have $[1, 2, 4, 4]$. Since the array has an even number of elements, we compute the mean of the elements before/after the middle point, 2 and 4, so the result is 3.

You must implement a function named `med` in *lib.js* as the other commands.

5 Write a test case for `med` (10 pts)

In *lib.test.js*, write at least ***two*** unit tests that can check the correctness of the function `med` you added.

6 Support the repeat operator, @ (30 pts)

If the user enters an expression $a@b$ as an argument, where a is a number, and b is a natural number, consider it as the number a repeated b times. Below is an example.

```
> stat sum 1@2 3 4
9
> stat sum 2@3 -2 1@3
7
> stat sum 3@0
Invalid repeat!
```

In the first case, $[1@2, 3, 4]$ is equivalent to $[1, 1, 3, 4]$, so their sum is 9. In the second case, $[2@3, -2, 1@3]$ is equivalent to $[2, 2, 2, -2, 1, 1, 1]$, so their sum is 7.

The repeat operator @ must work for all the commands you provide. 3.4@2 is a valid expression (it repeats 3.4 twice), but 2@0 is invalid since the second value, 0, must be a natural number by definition. If an invalid expression is entered, print out "Invalid repeat!" (without double-quotes). See the last line in the example above.

7 Write test cases for the repeat operator (10 pts)

In *main.test.js*, write at least ***three*** unit tests that can check the correctness of the repeat operator. If possible, test the operator for the commands you added, such as `min` or `med`.

8 Submission

The due is **April 23rd, 23:55 KST**. Pack your package using `npm pack`, and upload the tarball file to iCampus.

- Your code will be judged by an automated program. Double-check the command name and error messages, e.g., "Invalid repeat!".
- Your code will be checked by a copy checker. Keep your code private. This is an assignment, not a real open-source project.
- A report is **NOT** required.

9 Copyright

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