Description | Editorial | Solutions | Submissions

2676. Throttle

Premium

Solved

Medium | Companies | Hint

Given a function `fn` and a time in milliseconds `t`, return a **throttled** version of that function.

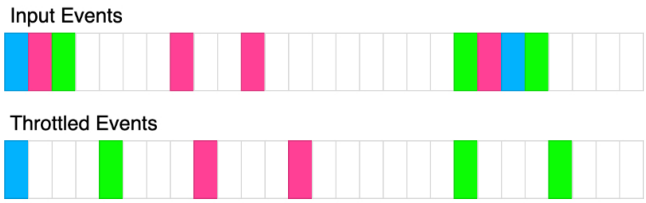
A **throttled** function is first called without delay and then, for a time interval of `t` milliseconds, can't be executed but should store the latest function arguments provided to call `fn` with them after the end of the delay.

For instance, `t = 50ms`, and the function was called at `30ms`, `40ms`, and `60ms`.

At `30ms`, without delay, the **throttled** function `fn` should be called with the arguments, and calling the **throttled** function `fn` should be blocked for the following `t` milliseconds.

At `40ms`, the function should just save arguments.

At `60ms`, arguments should overwrite currently stored arguments from the second call because the second and third calls are made before `80ms`. Once the delay has passed, the **throttled** function `fn` should be called with the latest arguments provided during the delay period, and it should also create another delay period of `80ms + t`.



The above diagram shows how throttle will transform events. Each rectangle represents 100ms and the throttle time is 400ms. Each color represents a different set of inputs.

Example 1:

```
Input:
t = 100,
calls = [
  {"t":20,"inputs":[1]}
]
Output: [{"t":20,"inputs":[1]}]
Explanation: The 1st call is always called without delay
```

Example 2:

```
Input:
t = 50,
calls = [
  {"t":50,"inputs":[1]},
  {"t":75,"inputs":[2]}
]
Output: [{"t":50,"inputs":[1]},{"t":100,"inputs":[2]}]
Explanation:
The 1st is called a function with arguments (1) without delay.
The 2nd is called at 75ms, within the delay period because 50ms + 50ms = 100ms, so the next
call can be reached at 100ms. Therefore, we save arguments from the 2nd call to use them at the
callback of the 1st call.
```

Example 3:

```
Input:
t = 70,
calls = [
  {"t":50,"inputs":[1]},
  {"t":75,"inputs":[2]},
  {"t":90,"inputs":[8]},
  {"t": 140, "inputs":[5,7]},
  {"t": 300, "inputs": [9,4]}
]
Output: [{"t":50,"inputs":[1]},{"t":120,"inputs":[8]},{"t":190,"inputs":[5,7]},
{"t":300,"inputs":[9,4]}]
Explanation:
The 1st is called a function with arguments (1) without delay.
The 2nd is called at 75ms within the delay period because 50ms + 70ms = 120ms, so it should
only save arguments.
The 3rd is also called within the delay period, and because we need just the latest function
arguments, we overwrite previous ones. After the delay period, we do a callback at 120ms with
saved arguments. That callback makes another delay period of 120ms + 70ms = 190ms so that the
next function can be called at 190ms.
The 4th is called at 140ms in the delay period, so it should be called as a callback at 190ms.
That will create another delay period of 190ms + 70ms = 260ms.
The 5th is called at 300ms, but it is after 260ms, so it should be called immediately and
should create another delay period of 300ms + 70ms = 370ms.
```

Constraints:

- `0 <= t <= 1000`
- `1 <= calls.length <= 10`
- `0 <= calls[i].t <= 1000`
- `0 <= calls[i].inputs[j], calls[i].inputs.length <= 10`

Seen this question in a real interview before? 1/5

Yes | No

Accepted 8.8K | Submissions 10.6K | Acceptance Rate 82.6%

Companies

Hint 1

Hint 2

Hint 3

Similar Questions

Discussion (12)

Code

TypeScript • Auto

```typescript
type F = (...args: number[]) => void;
type Timeout = ReturnType<typeof setTimeout>;

function throttle(fn: F, t: number): F {

    let lastExecTime = 0;
    let ref: NodeJS.Timeout | null = null;
    let curArgs: any[] | null = null;

    return function (...args) {
        const now = Date.now();

        if (now - lastExecTime >= t) {
            fn(...args);
            lastExecTime = now;
        } else {
            if (ref) clearTimeout(ref);

            ref = setTimeout(() => {
```

Saved

Ln 19, Col 37

Testcase | Test Result

Accepted Runtime: 76 ms

Case 1 | Case 2 | Case 3

Input

100

[{"t":20,"inputs":[1]}]

Output

[{"t":21,"inputs":[1]}]

Expected

[{"t":21,"inputs":[1]}]