

# 635. Design Log Storage System Premium

Medium Topics Companies

You are given several logs, where each log contains a unique ID and timestamp. Timestamp is a string that has the following format: `Year:Month:Day:Hour:Minute:Second`, for example, `2017:01:01:23:59:59`. All domains are zero-padded decimal numbers.

Implement the `LogSystem` class:

- `LogSystem()` Initializes the `LogSystem` object.
- `void put(int id, string timestamp)` Stores the given log `(id, timestamp)` in your storage system.
- `int[] retrieve(string start, string end, string granularity)` Returns the IDs of the logs whose timestamps are within the range from `start` to `end` inclusive. `start` and `end` all have the same format as `timestamp`, and `granularity` means how precise the range should be (i.e. to the exact `Day`, `Minute`, etc.). For example, `start = "2017:01:01:23:59:59"`, `end = "2017:01:02:23:59:59"`, and `granularity = "Day"` means that we need to find the logs within the inclusive range from **Jan. 1st 2017** to **Jan. 2nd 2017**, and the `Hour`, `Minute`, and `Second` for each log entry can be ignored.

### Example 1:

**Input**  
["LogSystem", "put", "put", "put", "retrieve", "retrieve"]  
[[], [1, "2017:01:01:23:59:59"], [2, "2017:01:01:22:59:59"], [3, "2016:01:01:00:00:00"], ["2016:01:01:01:01:01", "2017:01:01:23:00:00", "Year"], ["2016:01:01:01:01:01", "2017:01:01:23:00:00", "Hour"]]

**Output**  
[null, null, null, null, [3, 2, 1], [2, 1]]

**Explanation**  
LogSystem logSystem = new LogSystem();  
logSystem.put(1, "2017:01:01:23:59:59");  
logSystem.put(2, "2017:01:01:22:59:59");  
logSystem.put(3, "2016:01:01:00:00:00");  
  
// return [3,2,1], because you need to return all logs between 2016 and 2017.  
logSystem.retrieve("2016:01:01:01:01:01", "2017:01:01:23:00:00", "Year");  
  
// return [2,1], because you need to return all logs between Jan. 1, 2016 01:XX:XX and Jan. 1, 2017 23:XX:XX.  
// Log 3 is not returned because Jan. 1, 2016 00:00:00 comes before the start of the range.  
logSystem.retrieve("2016:01:01:01:01:01", "2017:01:01:23:00:00", "Hour");

### Constraints:

- `1 <= id <= 500`
- `2000 <= Year <= 2017`
- `1 <= Month <= 12`
- `1 <= Day <= 31`
- `0 <= Hour <= 23`
- `0 <= Minute, Second <= 59`
- `granularity` is one of the values `["Year", "Month", "Day", "Hour", "Minute", "Second"]`.
- At most `500` calls will be made to `put` and `retrieve`.

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Yes No

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