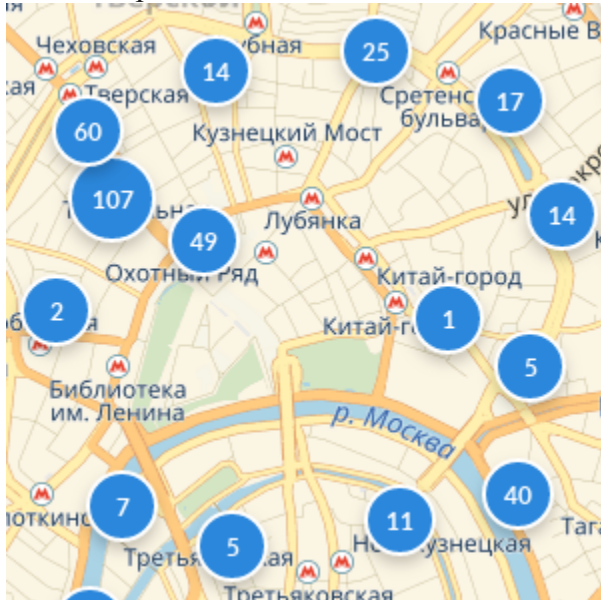# Test task: display of events on the timeline
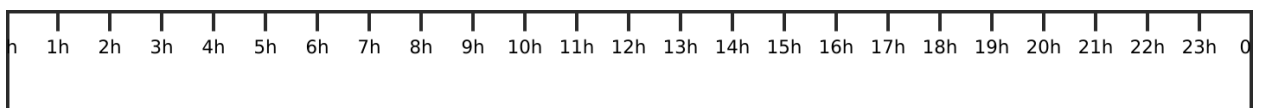*(Translated form Russian via Google Translate)*

Introduction

Sometimes it becomes necessary to display many objects in a small area of the screen. To avoid confusion, objects can be combined into groups, which, when scaled up, will split into smaller groups, or individual objects. For example, try searching for ads. about renting a quart on the site www.cian.ru. In the Moscow region of such announcements more than two tens of thousands. On the map, CIAN combines the labels of the ads in groups of circles with counters.
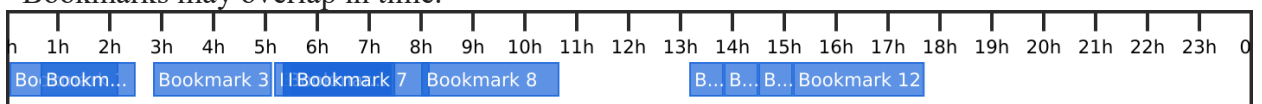

In our project we are faced with a similar problem when displaying hundreds or thousands of bookmarks on timeline. In this task, you are invited to implement a similar way to display bookmarks. The task Timeline To begin with, we will need the timeline itself, on which we will later display the bookmarks. For simplicity will always display a fixed time interval of 24 hours. The beginning of each hours should be marked with a vertical bar and, optionally, a text label ("0h", "15h"). Temporary the scale should occupy the entire width of the window and be correctly scaled when changing the width of the window.
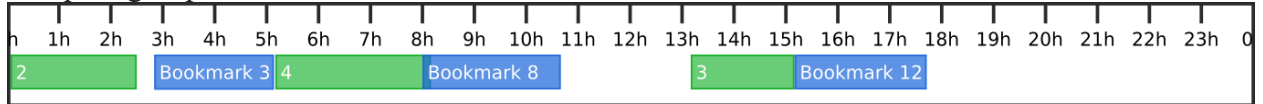

Bookmarks

To test the merge, we need a lot of bookmarks. Create a button after clicking on which the program will ask how many bookmarks you need to create (maximum 100,000,000), and then generate specified number of random bookmarks. Existing bookmarks must be deleted. Each bookmark should have a name, a start timestamp, and a duration (in milliseconds). The created bookmarks must satisfy the conditions:

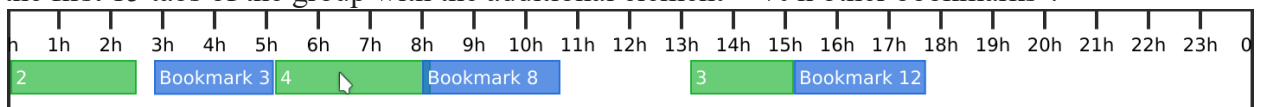• The name must contain a sequence number: "Bookmark 1", "Bookmark 2", etc.

• Bookmarks should be ordered by time: if i <j, then bookmark [i] .timestamp <= bookmark [j] .timestamp.

• Duration should not exceed three hours. one

• Bookmarks may overlap in time.

Now you can group bookmarks that are too close. Do it according to the following rule: "The group combines bookmarks that start in the same area screen width of 100 pixels. "Thus, in one group can not get bookmarks, visual the distance between beginnings of which exceeds 100 pixels. For the uniqueness of the distribution of groups, start the union from the leftmost tab. Groups, like bookmarks should have a name containing the number of bookmarks in the group, as well as the time and duration such that the area occupied by the group fully covers all areas occupied grouped bookmarks.

h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	0

2 | Bookmark 3 | 4 | Bookmark 8 | 3 | Bookmark 12

When you hover the mouse over a bookmark or group, the list of bookmarks in the group should be displayed under cursor, or the name of the bookmark, if it is one. You can show the list in a pop-up window, or in the same window under timeline. The list should be shown without delay, and should be updated without delay when you move the cursor. It is permissible to display only the first 15 tabs of the group with the additional element "+% n other bookmarks".

h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	0

2 | Bookmark 3 | 4 | Bookmark 8 | 3 | Bookmark 12

Bookmark 4
Bookmark 5
Bookmark 6
Bookmark 7

Bonuses

If you have completed the main part of the task, you can try to additionally implement scaling mouse wheel and timeline navigation by dragging the scale with the right mouse button held down. • When dragging the timeline, there should be no regrouping of events. • When zooming, rearrangement can be done with a delay, just as when changing window size. After that, you can also try to do: • Inertial dragging. Those. if you release the mouse button while dragging timeline, it will continue to move in the same direction, gradually slowing down to full stop. • Smooth zooming (animated).