

# Exercise – Date Methods

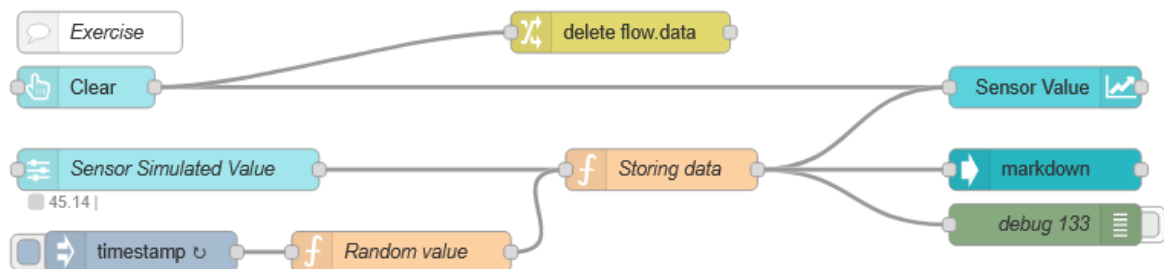
## Data Logging with Timestamps

Simulates data from a sensor and logs the data when it changes with a timestamp. Store the result in an array of objects and show it on the chart

### Calculate the following:

- Maximum value with timestamp
- Minimum value with timestamp
- Average value
- Total records logged

### Solution



### Solution Code:

```
[
  {
    "id": "dac11575941215b9",
    "type": "tab",
    "label": "In-built method project",
    "disabled": true,
```

```
"info": "",
"env": []
},
{
  "id": "aab07a724b6b25c",
  "type": "comment",
  "z": "dac11575941215b9",
  "name": "Exercise",
  "info": "",
  "x": 100,
  "y": 80,
  "wires": []
},
{
  "id": "1d4daf35ec7bf4af",
  "type": "ui-chart",
  "z": "dac11575941215b9",
  "group": "9243b26f3e6e6293",
  "name": "",
  "label": "Sensor Value",
  "order": 2,
  "chartType": "line",
  "category": "Simulated Value",
  "categoryType": "str",
  "xAxisProperty": "timestamp",
  "xAxisPropertyType": "msg",
  "xAxisType": "time",
  "yAxisProperty": "value",
  "ymin": "0",
  "ymax": "100",
  "action": "replace",
  "pointShape": "circle",
  "pointRadius": "3",
  "showLegend": true,
  "removeOlder": 1,
  "removeOlderUnit": "60",
  "removeOlderPoints": "100",
  "colors": [
    "#ff8040",
    "#aec7e8",
    "#ff7f0e",
    "#2ca02c",
    "#98df8a",
    "#d62728",
    "#ff9896",
    "#9467bd",
    "#c5b0d5"
```

```

    ],
    "width": "6",
    "height": "6",
    "className": "",
    "x": 790,
    "y": 120,
    "wires": [
        []
    ]
},
{
    "id": "94f88d6573561a32",
    "type": "ui-slider",
    "z": "dac11575941215b9",
    "group": "9243b26f3e6e6293",
    "name": "Sensor Simulated Value",
    "label": "Sensor Simulated Value",
    "tooltip": "",
    "order": 1,
    "width": 0,
    "height": 0,
    "passthru": false,
    "outs": "all",
    "topic": "topic",
    "topicType": "msg",
    "thumbLabel": true,
    "min": 0,
    "max": "100",
    "step": "0.01",
    "className": "",
    "x": 150,
    "y": 180,
    "wires": [
        [
            "d455f5edfa710981"
        ]
    ]
},
{
    "id": "9e492943ef8e9ea5",
    "type": "ui-button",
    "z": "dac11575941215b9",
    "group": "9243b26f3e6e6293",
    "name": "",
    "label": "Clear",
    "order": 3,
    "width": 0,

```

```

    "height": 0,
    "passthru": false,
    "tooltip": "",
    "color": "",
    "bgcolor": "",
    "className": "",
    "icon": "",
    "payload": "[]",
    "payloadType": "json",
    "topic": "topic",
    "topicType": "msg",
    "x": 90,
    "y": 120,
    "wires": [
      [
        "1d4daf35ec7bf4af",
        "36b430923d9c0d60"
      ]
    ]
  },
  {
    "id": "36b430923d9c0d60",
    "type": "change",
    "z": "dac11575941215b9",
    "name": "",
    "rules": [
      {
        "t": "delete",
        "p": "data",
        "pt": "flow"
      }
    ],
    "action": "",
    "property": "",
    "from": "",
    "to": "",
    "reg": false,
    "x": 480,
    "y": 80,
    "wires": [
      []
    ]
  },
  {
    "id": "9f752881f6735f04",
    "type": "ui-markdown",
    "z": "dac11575941215b9",

```

```
"group": "9243b26f3e6e6293",
"name": "",
"order": 0,
"width": 0,
"height": 0,
"content": "### Analytics\n - **Max. value**: at \n - **Min. value**: at \n - **Avg
value**: \n - **Total. records** : ",
"className": "",
"x": 790,
"y": 180,
"wires": [
  []
],
},
{
  "id": "3c3a79b16e633ab0",
  "type": "inject",
  "z": "dac11575941215b9",
  "name": "",
  "props": [
    {
      "p": "payload"
    },
    {
      "p": "topic",
      "vt": "str"
    }
  ],
  "repeat": "1",
  "crontab": "",
  "once": false,
  "onceDelay": 0.1,
  "topic": "",
  "payload": "",
  "payloadType": "date",
  "x": 130,
  "y": 240,
  "wires": [
    [
      "61d6c084b0bcd93f"
    ]
  ]
},
{
  "id": "61d6c084b0bcd93f",
  "type": "function",
  "z": "dac11575941215b9",
```

```

"name": "Random value",
"func": "msg.payload = parseFloat((Math.random()*100).toFixed(2));\nreturn msg;",
"outputs": 1,
"timeout": 0,
"noerr": 0,
"initialize": "",
"finalize": "",
"libs": [],
"x": 320,
"y": 240,
"wires": [
  [
    "d455f5edfa710981"
  ]
]
},
{
  "id": "d455f5edfa710981",
  "type": "function",
  "z": "dac11575941215b9",
  "name": "Storing data",
  "func": "var sensorValue = msg.payload;\nvar data = flow.get('data') || [];\n\nif\n(data.length >= 100)\n{\n  data = [];\n}\n\nfunction dataLog(value){\n  data.push(\n{\ntimestamp: new Date(),value: value}\n  )\n}\n\nfunction findMaxMinAvg(data) {\n  //\n  Use reduce to find max and min\n  const max = data.reduce((a, b) => b.value > a.value ? b :\na, { value: data[0].value });\n  const min = data.reduce((a, b) => b.value < a.value ? b : a, {\nvalue: data[0].value });\n  var average = 0;\n  var index = 0;\n  for (index = 0; index <\ndata.length; index++) {\n    average = average + data[index].value;\n  }\n  average =\n(average/data.length).toFixed(2);\n  return { max, min, average\n};\n}\n\ndataLog(sensorValue);\nflow.set('data', data);\n\nif (data.length > 0) {\nmsg.analytics = findMaxMinAvg(data);\nmsg.dataCount = data.length;\nmsg.topic =\n'Sensor value';\nmsg.payload = data;\nreturn msg;\n}",
  "outputs": 1,
  "timeout": 0,
  "noerr": 0,
  "initialize": "",
  "finalize": "",
  "libs": [],
  "x": 510,
  "y": 180,
  "wires": [
    [
      "0c96766a0fab40f8",
      "1d4daf35ec7bf4af",
      "9f752881f6735f04"
    ]
  ]
}
]

```

```
},
{
  "id": "0c96766a0fab40f8",
  "type": "debug",
  "z": "dac11575941215b9",
  "name": "debug 133",
  "active": false,
  "tosidebar": true,
  "console": false,
  "tostatus": false,
  "complete": "true",
  "targetType": "full",
  "statusVal": "",
  "statusType": "auto",
  "x": 790,
  "y": 220,
  "wires": []
},
{
  "id": "9243b26f3e6e6293",
  "type": "ui-group",
  "name": "Sensor data analytics",
  "page": "d3ffcca239be4f8d",
  "width": "6",
  "height": "1",
  "order": -1,
  "showTitle": true,
  "className": "",
  "visible": "true",
  "disabled": "false"
},
{
  "id": "d3ffcca239be4f8d",
  "type": "ui-page",
  "name": "JavaScript essentials for Node-RED",
  "ui": "5a4a3207cec084a0",
  "path": "/page2",
  "icon": "home",
  "layout": "grid",
  "theme": "bfddf56681b5cab8",
  "order": -1,
  "className": "",
  "visible": "true",
  "disabled": "false"
},
{
  "id": "5a4a3207cec084a0",
```

```
"type": "ui-base",
"name": "UI Name",
"path": "/dashboard",
"includeClientData": true,
"acceptsClientConfig": [
  "ui-notification",
  "ui-control"
],
"showPathInSidebar": false
},
{
  "id": "bfddf56681b5cab8",
  "type": "ui-theme",
  "name": "Theme Name",
  "colors": {
    "surface": "#ffffff",
    "primary": "#0094ce",
    "bgPage": "#eeeeee",
    "groupBg": "#ffffff",
    "groupOutline": "#cccccc"
  },
  "sizes": {
    "pagePadding": "12px",
    "groupGap": "12px",
    "groupBorderRadius": "4px",
    "widgetGap": "12px"
  }
}
]
```