

debugging



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INDEX

- What is debugging?
- How to debugging?
- 🌎 Chrome Dev Tools
 - alert();
 - console
 - Network
 - Breakpoints
 - Blackboxing

What is debugging?

bug?

프로그램 내의 결함이나 문제점을 이야기하는 것으로
프로그래밍 언어 COBOL의 개발을 주도한
그레이스 호퍼가 1945년 Mark II의 오작동 원인을
찾다가 컴퓨터에 나방이 껴있는 걸 발견한 것

bug?

0800 Antran started
1000 " stopped - antran ✓
13" 06 (032) MP - MC
(033) PRO 2
coset

$\left\{ \begin{array}{l} 1.2700 \quad 9.037847025 \\ 9.037846795 \end{array} \right.$ coset
~~1.982147000~~
~~2.130476715(-3)~~ 4.615925059(-2)
2.130476415
2.130676415

Relays 6-2 in 033 failed special speed test
in relay

Relay
2145
Relay 3370

1100 Started Cosine Tape (Sine check)
1525 Started Multi Adder Test.

1545



Relay #70 Panel F
(moth) in relay.

1630 Antran started.
1700 closed down.

First actual case of bug being found.

debugging === removeBug

컴퓨터 프로그램의 정확성이나
논리적인 오류(버그)를 검출하여 제거하는 과정

How to debugging?



Chrome Dev Tools



Chrome Dev Tools

- `alert();`
- `console`
- Network
- Breakpoint
- Blackboxing

```
alert();
```

PASS 😊

console



Chrome Dev Tools > `console`

`console.log();`

`console.dir();`

`console.time();`

`console.group();`

`console.table();`



`console.log();` // 로그

`console.dir();` // 폴더화(객체)

`console.time();` // 경과시간

`console.group();` // 그룹지정

`console.table();` // 데이터 시각화

```
console.log();
```

 **Chrome Dev Tools > console > console.log()**

```
console.log(arr[2]);
```

```
console.log('이름: ' + obj.name);
```

```
if (goal === true) {  
    console.log('성공');  
} else {  
    console.log('실패');  
}
```

```
console.dir();
```



Chrome Dev Tools > `console` > `console.dir();`

```
var el = document.getElementById('name');

console.log(el);
console.dir(el);
```



Chrome Dev Tools > `console` > `console.dir();`

```
> console.log(el);
  ▼<div id="header">
    ►<div class="header_inner">...</div>
    ►<div id="gnb" style="height: 1259px;">...</div>
  </div>
```



Chrome Dev Tools > `console` > `console.dir();`

```
> console.dir(el);
  ▼div#header ⓘ
    accessKey: ""
    align: ""
    assignedSlot: null
  ►attributeStyleMap: StylePropertyMap {size: 0}
  ►attributes: NamedNodeMap {0: id, id: id, length: 1}
    autocapitalize: ""
    baseURI: "http://210.16.195.78:8040/converter/simulation-tool.do"
    childElementCount: 2
  ►childNodes: NodeList(5) [text, div.header_inner, text, div#gnb, text]
  ►children: HTMLCollection(2) [div.header_inner, div#gnb, gnb: div#gnb]
```

```
console.time();
```



Chrome Dev Tools > `console` > `console.time();`

```
console.time('반복문 경과 시간');

var arr = [];
for (var i = 1; i < 1000; i++) {
    for (var j = 1; j < 1000; j++) {
        arr.push(j);
    }
}

console.timeEnd('반복문 경과 시간');
```



Chrome Dev Tools > `console` > `console.time();`

```
> console.time('반복문 경과 시간');

var arr = [];
for (var i = 1; i < 1000; i++) {
    for (var j = 1; j < 1000; j++) {
        arr.push(j);
    }
}

console.timeEnd('반복문 경과 시간');
```

반복문 경과 시간: 20.490234375ms

VM167:10

```
console.group();
```

 **Chrome Dev Tools > console > console.group();**

```
var _name = ['박진형', '김혜인', '김웅진', '최지영'];
var _location = ['하남', '청주', '인천', '경기'];

console.group('이름');
console.log(_name);
console.groupEnd('이름');

console.group('지역');
console.log(_location);
console.groupEnd('지역');
```

 Chrome Dev Tools > `console` > `console.group();`

```
> var _name = ['박진형', '김혜인', '김웅진', '최지영'];
var _location = ['하남', '청주', '인천', '경기'];

console.group('이름');
console.log(_name);
console.groupEnd('이름');

console.group('지역');
console.log(_location);
console.groupEnd('지역');
```

▼ 이름

VM737:

```
▶ (4) ["박진형", "김혜인", "김웅진", "최지영"]
```

VM737:

▼ 지역

VM737:

```
▶ (4) ["하남", "청주", "인천", "경기"]
```

VM737:

```
console.table();
```



Chrome Dev Tools > `console` > `console.table();`

```
var data = [
  {
    "name": "박진형",
    "location": "하남",
    "tel": "4989"
  },
  {
    "name": "정혜윤",
    "location": "남양주",
    "tel": "4987"
  },
  {
    "name": "김웅진",
    "location": "일산",
    "tel": "4978"
  }
];
```



Chrome Dev Tools > console > console.table();

```
> console.table(data);
```

VM9116:1

(index)	name	location	tel
0	"박진형"	"하남"	"4989"
1	"정혜윤"	"남양주"	"4987"
2	"김웅진"	"일산"	"4978"

▶ Array(3)

Network



Chrome Dev Tools > Network

The screenshot shows the Network tab in the Chrome Dev Tools interface. At the top, there are tabs for Elements, Console, Sources, Network (which is selected), Memory, Performance, Application, Security, Audits, and Adblock Plus. Below the tabs is a toolbar with icons for play, stop, and search, followed by a 'View' section containing 'Group by frame', 'Preserve log', 'Disable cache', and 'Offline' checkboxes. A dropdown menu labeled 'No throttling' is open, showing options: Disabled (selected), No throttling (highlighted in blue), Presets, Fast 3G, Slow 3G, Offline, Custom, test_loading, and Add... . The main area displays a timeline from 10 ms to 50 ms with various network requests listed below it. The columns in the table are Status, Type, and several other columns that are mostly hidden or collapsed.

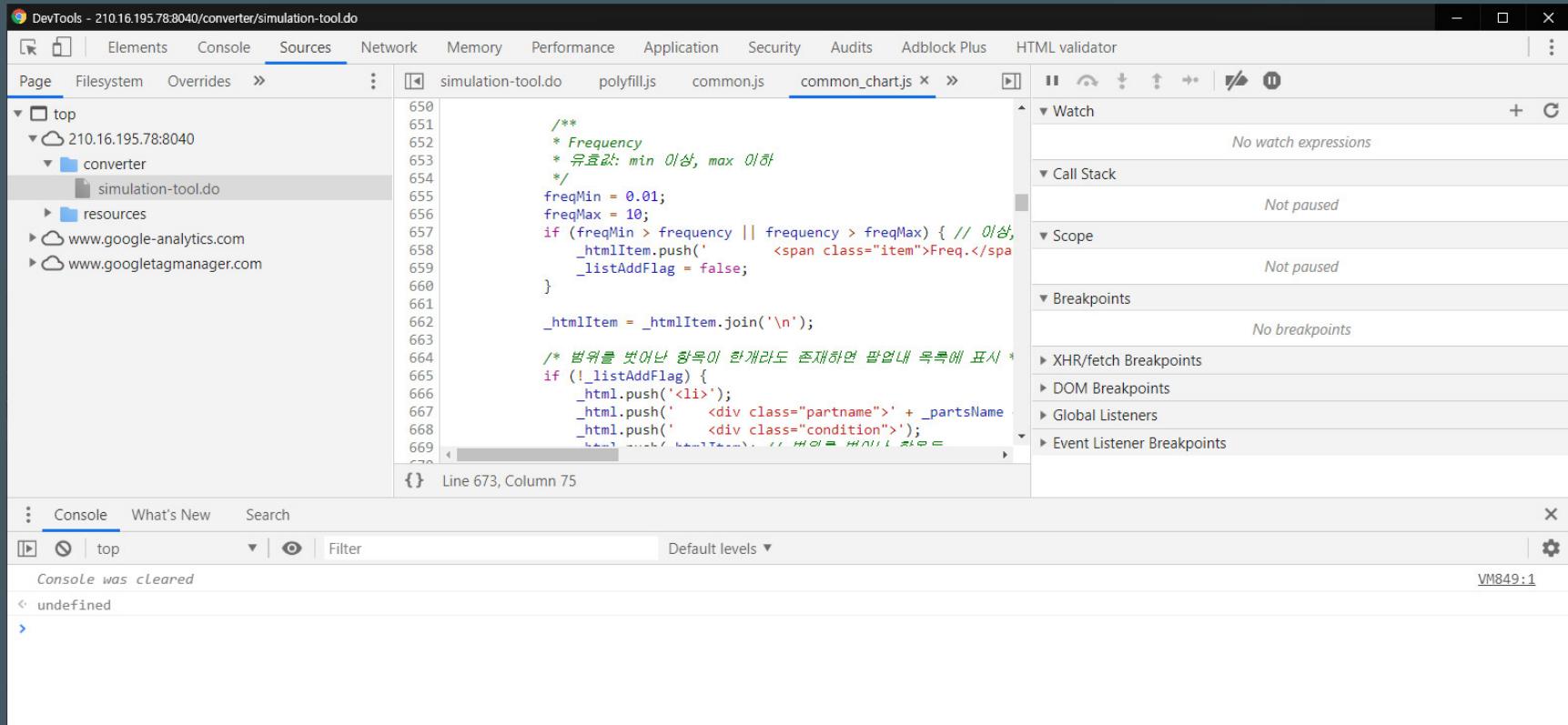


Breakpoints





Chrome Dev Tools > Breakpoints





Chrome Dev Tools > Breakpoints



The screenshot shows the Chrome DevTools interface with the following tabs open:

- Sources**: The active tab, showing the file structure and code for `simulation-tool.do`. A blue box highlights the "File Navigation" section in the left sidebar.
- Console**: Shows the message "Console was cleared".
- Network**: Shows network requests for `top`, `210.16.195.78:8040`, `converter`, `simulation-tool.do`, `resources`, `www.google-analytics.com`, and `www.googletagmanager.com`.

The main content area displays the following code snippet from `simulation-tool.do`:

```
650      /**
651       * Frequency
652       * 유도값: min 0 이상, max 0.01
653       */
654   freqMin = 0.01;
655   freqMax = 10;
656   if (freqMin > frequency || frequency > freqMax) { // 이상,
657     _htmlItem.push('      <span class="item">Freq.</span>');
658     _listAddFlag = false;
659   }
660
661   _htmlItem = _htmlItem.join('\n');
662
663   /* 범위를 벗어난 항목이 한개라도 존재하면 팝업내 목록에 표시 */
664   if (!_listAddFlag) {
665     _html.push('<li>');
666     _html.push('      <div class="partname">' + _partsName);
667     _html.push('      <div class="condition">');
668     _html.push('        <input type="checkbox" /> ' + name);
669   }
670 }
```

The status bar at the bottom right indicates `VM849:1`.



Chrome Dev Tools > Breakpoints



The screenshot shows the Chrome DevTools interface with the Sources tab selected. The left sidebar lists the project structure, including files like simulation-tool.do, polyfill.js, common.js, and common_chart.js. The common_chart.js file is currently open in the Source Editor, showing code related to frequency calculations and HTML generation. A blue callout box highlights the "Source Editor" label. The right panel contains the Breakpoints sidebar, which is currently empty, indicating no breakpoints have been set.

DevTools - 210.16.195.78:8040/converter/simulation-tool.do

Elements Console Sources Network Memory Performance Application Security Audits Adblock Plus HTML validator

Page Filesystem Overrides »

top
210.16.195.78:8040
converter
resources
www.google-analytics.com
www.googletagmanager.com

simulation-tool.do polyfill.js common.js common_chart.js »

650 /**
651 * Frequency
652 * 允許한 min 이상, max 이하
653 */
654 freqMin = 0.01;
655 freqMax = 10;
656 if (freqMin > frequency || frequency > freqMax) { // 이상,
657 _htmlItem.push(''Freq.'');
658 _listAddFlag = false;
659 }
660
661 _htmlItem = _htmlItem.join('');
662
663 // 업데이트에 표시
664
665 _html.push('');
666 _html.push(''<div class="partname">' + _partsName + '</div>');
667 _html.push(''<div class="condition">' + _partsCondition + '</div>');

{ } Line 673, Column 75

Console What's New Search

Default levels ▾

Console was cleared

< undefined

>

Watch No watch expressions

Call Stack Not paused

Scope Not paused

Breakpoints No breakpoints

XHR/fetch Breakpoints

DOM Breakpoints

Global Listeners

Event Listener Breakpoints

VM849:1



Chrome Dev Tools > Breakpoints



The screenshot shows the Chrome DevTools interface with the Sources tab selected. The left sidebar displays the file structure, and the main pane shows the code for `common_chart.js`. A red arrow points to line 673, which contains a conditional statement. A blue box labeled "Debug Info" covers the right sidebar, which includes sections for Watch, Call Stack, Scope, and Breakpoints.

DevTools - 210.16.195.78:8040/converter/simulation-tool.do

Elements Console Sources Network Memory Performance Application Security Audits Adblock Plus HTML validator

Page Filesystem Overrides >

top
210.16.195.78:8040
converter
simulation-tool.do
resources
www.google-analytics.com
www.googletagmanager.com

simulation-tool.do polyfill.js common.js common_chart.js

650 `/*`
651 `* Frequency`
652 `* 유도값: min 0 이상, max 0.8`
653 `*/`
654 `freqMin = 0.01;`
655 `freqMax = 10;`
656 `if (freqMin > frequency || frequency > freqMax) { // 이상,`
657 `_htmlItem.push(''Freq.'`
658 `_listAddFlag = false;`
659 }
660
661 `_htmlItem = _htmlItem.join('\n');`
662
663 `/* 범위를 벗어난 항목이 한개라도 존재하면 팝업내 목록에 표시 */`
664 `if (!listAddFlag) {`
665 `_html.push('');`
666 `_html.push(''<div class="partname">' + _partsName[`
667 `_html.push(''<div class="condition">');`
668 `_html.push('</div>'); // HTML은 한줄로 써야 한다는 제한`
669 }
670
Line 673, Column 75

Console What's New Search

Console was cleared
< undefined
>

Default levels ▾

VM849:1

Watch
No watch expressions

Call Stack
Not paused

Scope
Not paused

Breakpoints

XHR/fetch Breakpoints
DOM Breakpoints
Global Listeners
Event Listener Breakpoints

Debug Info

 **Chrome Dev Tools > Breakpoints** 

- Watch
- Call Stack
- Scope
 - Local
 - Global
- Breakpoints
- Event Listener Breakpoints

Chrome Dev Tools > Breakpoints ⏱

The screenshot shows the Chrome Dev Tools interface with the Sources tab selected. A breakpoint is set on line 2277 of the `common_chart.js` file. The code snippet is as follows:

```
* @param {string} typeObj 차트 유형
* @param {object} targetObj 정보 가져올 대상
* @return {object} 선택한 정보
*/
 getInfoData: function (typeObj, targetObj) {
  targetObj = targetObj || {
    selectedPartId: 'selectedList', // default id 2: Selected Parts (선택 목록의 높수 정보)
    modelModeName: 'modelTypeList', // default name 2: Model Mode (체크박스 value 정보)
    mountingName: 'mountingTypeList', // default name 2: Mounting (체크박스 value 정보)
    solderName: 'solderTypeList' // default name 2: Solder (체크박스 value 정보)
  };
  var semChart = SEM.chart; // semChart = {isRun: false, chartOriginData: {...}, chartTempObj: {...}}
  var info = {}; // ajax request data info = {}
  var simulationType = [
    '|Z|': 'TEMPDC',
    'R': 'TEMPDC',
    '|X|': 'TEMPDC',
    '|Z|_R': 'TEMPDC',
    'C': 'TEMPDC',
    'L': 'TEMPDC',
    'Q': 'TEMPDC',
    'DF': 'TEMPDC',
    'SDB': 'TEMPDC',
    'Smithchart': 'TEMPDC',
    'LTemp': 'TEMPDC',
    'ACRF': 'TEMPDC',
    'Ls': 'TEMPDC',
    'Rs': 'TEMPDC',
    '|L|_R': 'TEMPDC'
  ];
  ...
}

Line 2277, Column 30
```

The Watch sidebar on the right shows the following variables:

- Debugger paused
- Watch
 - info: Object
 - __proto__: Object
- Call Stack
 - getInfoData common_chart.js:2279
 - (anonymous) common_chart.js:824
 - dispatch jquery-1.11.3.min.js:4
 - r.handle jquery-1.11.3.min.js:4
- Scope
- Local
 - capacitorPart: undefined
 - getCheckedValue: f getCheckedValue(name)
 - inductorPart: undefined
 - info: {}
 - infoPart: undefined
 - modelModeChecked: undefined
 - mountingChecked: undefined
 - sType: undefined
 - semChart: {isRun: false, chartOriginData: {...}, chartTempObj: {...}}
 - simulationType: undefined
 - solderChecked: undefined
 - targetObj: {selectedPartId: "selectedList", modelModeName: "modelTypeList", mountingName: "mountingTypeList", solderName: "solderTypeList"}
 - __proto__: Object
 - this: Object

Chrome Dev Tools > Breakpoints ⏱

The screenshot shows the Chrome Dev Tools interface with the Sources tab selected. A breakpoint is set on line 2277 of the `common_chart.js` file. The code snippet is as follows:

```
* @param {string} typeObj 차트 유형
* @param {object} targetObj 정보 가져올 대상
* @return {object} 선택한 정보
*/
 getInfoData: function (typeObj, targetObj) {
  targetObj = targetObj || {
    selectedPartId: 'selectedList', // default id 2: Selected Parts (선택 목록의 높수 정보)
    modelModeName: 'modelTypeList', // default name 2: Model Mode (체크박스 value 정보)
    mountingName: 'mountingTypeList', // default name 2: Mounting (체크박스 value 정보)
    solderName: 'solderTypeList' // default name 2: Solder (체크박스 value 정보)
  };
  var semChart = SEM.chart; // semChart = {isRun: false, chartOriginData: {...}, chartTempObj: {...}}
  var info = {}; // ajax request data info = {}
  var simulationType = [
    '|Z|': 'TEMPDC',
    'R': 'TEMPDC',
    '|X|': 'TEMPDC',
    '|Z|_R': 'TEMPDC',
    'C': 'TEMPDC',
    'L': 'TEMPDC',
    'Q': 'TEMPDC',
    'DF': 'TEMPDC',
    'SDB': 'TEMPDC',
    'Smithchart': 'TEMPDC',
    'LTemp': 'TEMPDC',
    'ACRF': 'TEMPDC',
    'Ls': 'TEMPDC',
    'Rs': 'TEMPDC',
    '|L|_R': 'TEMPDC'
  ];
  ...
}

Line 2277, Column 30
```

The Watch sidebar on the right shows the following variables:

- Debugger paused
- Watch
 - info: Object
 - __proto__: Object
- Call Stack
 - getInfoData common_chart.js:2279
 - (anonymous) common_chart.js:824
 - dispatch jquery-1.11.3.min.js:4
 - r.handle jquery-1.11.3.min.js:4
- Scope
- Local
 - capacitorPart: undefined
 - getCheckedValue: f getCheckedValue(name)
 - inductorPart: undefined
 - info: {}
 - infoPart: undefined
 - modelModeChecked: undefined
 - mountingChecked: undefined
 - sType: undefined
 - semChart: {isRun: false, chartOriginData: {...}, chartTempObj: {...}}
 - simulationType: undefined
 - solderChecked: undefined
 - targetObj: {selectedPartId: "selectedList", modelModeName: "modelTypeList", mountingName: "mountingTypeList", solderName: "solderTypeList"}
 - this: Object

관찰하고 싶은 객체, 변수 등을 등록

Chrome Dev Tools > Breakpoints ⏱

The screenshot shows the Chrome Dev Tools interface with the Sources tab selected. A breakpoint is set on line 2277 of the `common_chart.js` file. The code editor highlights the line with a blue background. The `Call Stack` panel is open, showing the following stack trace:

```
getChartData
(anonymous)
dispatch
r.handle
```

The `Watch` panel shows the following variables:

- `info: Object`
- `targetObj: {selectedPartId: "selectedList", modelModeName: "modelTypeList", mountingName: "mountingTypeList", solderName: "solderTypeList"}`
- `this: Object`

The bottom of the DevTools window shows the Console tab is active, and the status bar indicates there are 2 hidden scripts.

Chrome Dev Tools > Breakpoints ⏱

The screenshot shows the Chrome Dev Tools interface with the Sources tab selected. A breakpoint is set on line 2277 of the `common_chart.js` file. The code editor highlights the line with a blue background. The `Call Stack` panel is open, displaying the following stack trace:

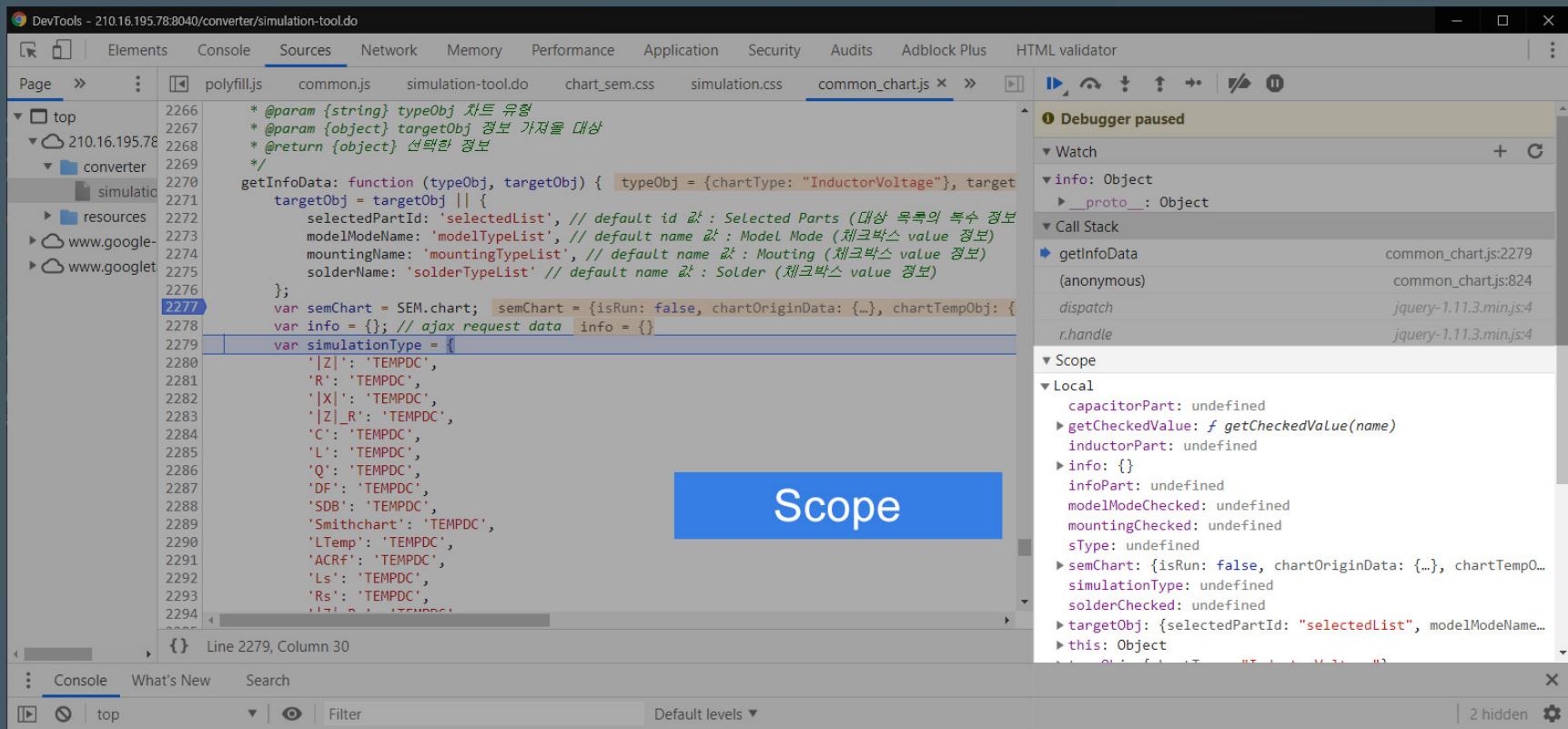
```
Call Stack
getInfoData
(anonymous)
dispatch
r.handle
```

The right-hand sidebar displays the `Debugger paused` status and the `Watch` pane, which lists variables and their values.

```
Debugger paused
Watch
info: Object
  > __proto__: Object
Call Stack
getInfoData
(anonymous)
dispatch
r.handle
Scope
Local
  capacitorPart: undefined
  getCheckedValue: f getCheckedValue(name)
  inductorPart: undefined
  info: {}
  infoPart: undefined
  modelModeChecked: undefined
  mountingChecked: undefined
  sType: undefined
  semChart: {isRun: false, chartOriginData: {...}, chartTempO...
  simulationType: undefined
  solderChecked: undefined
  targetObj: {selectedPartId: "selectedList", modelModeName...
  this: Object
```

콜스택 설명}}}

Chrome Dev Tools > Breakpoints



The screenshot shows the Chrome Dev Tools interface with the Sources tab selected. The code editor displays a file named `common_chart.js`. A red arrow points to line 2277, which contains a breakpoint. The right side of the screen shows the Debugger tools:

- Debugger paused**: Shows the current state of the debugger.
- Watch**: Shows variables `info` (an object) and `targetObj` (an object).
- Call Stack**: Shows the call stack from `getInfoData` to `r.handle`.
- Scope**: A large blue box highlights this section, showing local variables: `capacitorPart`, `getCheckedValue`, `inductorPart`, `info`, `infoPart`, `modelModeChecked`, `mountingChecked`, `sType`, `semChart`, `simulationType`, `solderChecked`, `targetObj`, and `this`.
- Local**: Shows the values of the local variables listed above.

The bottom of the DevTools window shows the Console, What's New, and Search tabs, along with a Filter and Default levels dropdown.

```
* @param {string} typeObj 차트 유형
* @param {object} targetObj 정보 가져올 대상
* @return {object} 선택한 정보
*/
 getInfoData: function (typeObj, targetObj) {
    typeObj = {chartType: "InductorVoltage"}, targetObj = targetObj || {
        selectedPartId: 'selectedList', // default id 2t : Selected Parts (대상 목록의 높수 정보)
        modelModeName: 'modelTypeList', // default name 2t : Model Mode (체크박스 value 정보)
        mountingName: 'mountingTypeList', // default name 2t : Mounting (체크박스 value 정보)
        solderName: 'solderTypeList' // default name 2t : Solder (체크박스 value 정보)
    };
    var semChart = SEM.chart; semChart = {isRun: false, chartOriginData: {}, chartTempObj: {}};
    var info = {}; // ajax request data info = {}
    var simulationType = [
        '|Z|': 'TEMPDC',
        'R': 'TEMPDC',
        '|X|': 'TEMPDC',
        '|Z|_R': 'TEMPDC',
        'C': 'TEMPDC',
        'L': 'TEMPDC',
        'Q': 'TEMPDC',
        'DF': 'TEMPDC',
        'SDB': 'TEMPDC',
        'Smithchart': 'TEMPDC',
        'LTemp': 'TEMPDC',
        'ACRF': 'TEMPDC',
        'Ls': 'TEMPDC',
        'Rs': 'TEMPDC',
        'Mf': 'TEMPDC'
    ];
    Line 2277, Column 30
    };
```

Chrome Dev Tools > Breakpoints

The screenshot shows the Chrome DevTools interface with the 'Breakpoints' tab selected. The left pane displays the source code for 'common_chart.js' with line 2277 highlighted. A blue box labeled 'Scope' highlights the right-hand sidebar, which lists the current scope variables:

- Debugger paused
- Watch
- info: Object
- Call Stack
- getInfoData common_chart.js:2279
- (anonymous) common_chart.js:824
- dispatch jquery-1.11.3.min.js:4
- r.handle jquery-1.11.3.min.js:4
- Scope
- Local
- capacitorPart: undefined
- getCheckedValue: f getCheckedValue(name)
- inductorPart: undefined
- info: {}
- infoPart: undefined
- modelModeChecked: undefined
- mountingChecked: undefined
- sType: undefined
- semChart: {isRun: false, chartOriginData: {...}, chartTempO...}
- simulationType: undefined
- solderChecked: undefined
- targetObj: {selectedPartId: "selectedList", modelModeName...}
- this: Object

At the bottom, the console tab is active, showing the message 'Scope'.

현재 시점의 유효 범위에서 등록된 변수 목록



Chrome Dev Tools > Breakpoints



The screenshot shows the Chrome Dev Tools interface with the Sources tab selected. The left sidebar displays the file structure, and the main pane shows the code for `common_chart.js`. A blue box highlights the line `var semChart = SEM.chart;` at line 2277. The right sidebar is the Breakpoints panel, which lists two breakpoints:

- `common_chart.js:2277`: `var semChart = SEM.chart;`
- `common_chart.js:2310`: `info.graphType = typeObj.chartType;`

The Breakpoints panel also includes sections for XHR/fetch Breakpoints, DOM Breakpoints, Global Listeners, and Event Listener Breakpoints.

```
DevTools - 210.16.195.78:8040/converter/simulation-tool.do
Elements Console Sources Network Memory Performance Application Security Audits Adblock Plus HTML validator
Page > top 2272 common.js simulation-tool.do chart_sem.css simulation.css common_chart.js >
2273 selectedPartId: 'selectedList', // default id 값 : Selected Parts (선택 목록의 초기 정보)
2274 modelModeName: 'modelTypeList', // default name 값 : Model Mode (체크박스 value 정보)
2275 mountingName: 'mountingTypeList', // default name 값 : Mounting (체크박스 value 정보)
2276 solderName: 'solderTypeList' // default name 값 : Solder (체크박스 value 정보)
2277 };
2278 var semChart = SEM.chart; semChart = {isRun: false, chartOriginData: {...}, chartTempObj: {...}}
2279 var info = {} // ajax request data info = {}
2280 var simulationType = {
2281   '|Z|': 'TEMPDC',
2282   'R': 'TEMPDC',
2283   '|X|': 'TEMPDC',
2284   '|Z|_R': 'TEMPDC',
2285   'C': 'TEMPDC',
2286   'L': 'TEMPDC',
2287   'Q': 'TEMPDC',
2288   'DF': 'TEMPDC',
2289   'SDB': 'TEMPDC',
2290   'Smithchart': 'TEMPDC',
2291   'LTemp': 'TEMPDC',
2292   'ACRF': 'TEMPDC',
2293   'Ls': 'TEMPDC',
2294   'Rs': 'TEMPDC',
2295   '|Z|_Rs': 'TEMPDC',
2296   'DCBias': 'CHAR',
2297   'ACVolt': 'CHAR',
2298   'RippleCurr': 'CHAR',
2299   'TCC': 'CHAR',
2300   'DCBiasByTemp': 'TCCDC',
2301 }
2302
Line 2279, Column 30
Console What's New Search
Default levels ▾
Breakpoints
X 2 hidden
Global
Breakpoints
 common_chart.js:2277
 common_chart.js:2310
XHR/fetch Breakpoints
DOM Breakpoints
Global Listeners
Event Listener Breakpoints
```

Chrome Dev Tools > Breakpoints

The screenshot shows the Chrome Dev Tools interface with the Sources tab selected. A blue callout box labeled "Breakpoints" points to the Breakpoints section in the right sidebar. In the code editor, line 2277 of `common_chart.js` is highlighted:

```
    var semChart = SEM.chart; semChart = {isRun: false, chartOriginData: {...}, chartTempObj: {...}}
    var info = {}; // ajax request data info = {}
```

The right sidebar displays the global object and the Breakpoints section, which lists two breakpoints:

- `common_chart.js:2277`: `var semChart = SEM.chart;`
- `common_chart.js:2310`: `info.graphType = typeObj.chartType;`

At the bottom of the sidebar, there are sections for XHR/fetch Breakpoints, DOM Breakpoints, Global Listeners, and Event Listener Breakpoints.

지정한 포인트에서 중단

Chrome Dev Tools > Breakpoints

The screenshot shows the Chrome DevTools interface with the Sources tab selected. The left sidebar displays the file structure and current file: common_chart.js. The main pane shows the code for the `getInfoData` function. A blue callout box labeled "Event Listener Breakpoints" points to the right sidebar, which lists various event types that can be monitored. The "submit" checkbox under the "Control" section is checked, indicating it is active.

```
    * @param {string} typeObj 차트 유형
    * @param {object} targetObj 정보 가져올 대상
    * @return {object} 선택한 정보
*/
getInfoData: function (typeObj, targetObj) {
    targetObj = targetObj || {
        selectedPartId: 'selectedList', // default id 값 : Selected Parts (내장 목록의 높수 정보)
        modelModeName: 'modelTypeList', // default name 값 : Model Mode (체크박스 value 정보)
        mountingName: 'mountingTypeList', // default name 값 : Mounting (체크박스 value 정보)
        solderName: 'solderTypeList' // default name 값 : Solder (체크박스 value 정보)
    };
    var semChart = SEM.chart;
    var info = {}; // ajax request data
    var simulationType = {
        'Z': 'TEMPDC',
        'R': 'TEMPDC',
        'X': 'TEMPDC',
        'Z_R': 'TEMPDC',
        'C': 'TEMPDC',
        'L': 'TEMPDC',
        'Q': 'TEMPDC',
        'DF': 'TEMPDC',
        'SDB': 'TEMPDC',
        'Smithchart': 'TEMPDC',
        'LTemp': 'TEMPDC',
        'ACRF': 'TEMPDC',
        'Ls': 'TEMPDC',
        ...
    };
}
```

Event Listener Breakpoints

- ▶ Animation
- ▶ Canvas
- ▶ Clipboard
- ▶ Control
 - resize
 - scroll
 - zoom
 - focus
 - blur
 - select
 - change
 - submit
 - reset
- ▶ DOM Mutation
- ▶ Device

Chrome Dev Tools > Breakpoints

The screenshot shows the Chrome DevTools interface with the 'Breakpoints' tab selected in the top navigation bar. The main pane displays a portion of the 'common_chart.js' file, specifically the 'getInfoData' function. A blue callout box highlights the 'Event Listener Breakpoints' section in the right-hand sidebar. This sidebar lists various event types: Animation, Canvas, Clipboard, Control, DOM Mutation, and Device. Under the 'Control' category, several events are listed with checkboxes: resize, scroll, zoom, focus, blur, select, change, submit (which is checked), and reset.

```
    * @param {string} typeObj 차트 유형
    * @param {object} targetObj 정보 가져올 대상
    * @return {object} 선택한 정보
    */
getInfoData: function (typeObj, targetObj) {
    targetObj = targetObj || {
        selectedPartId: 'selectedList', // default id 값 : Selected Parts (내장 목록의 높수 정보
        modelModeName: 'modelTypeList', // default name 값 : Model Mode (체크박스 value 정보)
        mountingName: 'mountingTypeList', // default name 값 : Mounting (체크박스 value 정보)
        solderName: 'solderTypeList' // default name 값 : Solder (체크박스 value 정보)
    };
    var semChart = SEM.chart;
    var info = {}; // ajax request data
    var simulationType = {
        'Z': 'TEMPDC',
        'R': 'TEMPDC',
        'X': 'TEMPDC',
        'Z_R': 'TEMPDC',
        'C': 'TEMPDC',
        'L': 'TEMPDC',
        'Q': 'TEMPDC',
        'DF': 'TEMPDC',
        'SDB': 'TEMPDC',
        'Smithchart': 'TEMPDC',
        'LTemp': 'TEMPDC',
        'ACRF': 'TEMPDC',
        'Ls': 'TEMPDC',
        ...
    }
}
```

Line 2341, Column 52

Console What's New Search

Default levels ▾

2 hidden

선택한 event가 발생할 때 중단

Chrome Dev Tools > Breakpoints

The screenshot shows the Chrome Dev Tools interface with the 'Sources' tab selected. The left sidebar lists files: polyfill.js, common.js, simulation-tool.do, jquery-1.11.3.min.js, and common_chart.js. The right sidebar contains sections for Watch, Call Stack, Scope, and Breakpoints. Under Breakpoints, a checkbox is checked for line 2308 of common_chart.js, which is highlighted with a red rectangle. The code editor shows the following snippet:

```
    return infoDown;
},
/**
 * 차트 그릴 때 필요한 정보 가져오기 - ajax request data
 * @function SEM.chart.getInfoData
 * @param {string} typeObj 차트 유형
 * @param {object} targetObj 정보를 대상
 * @return {object} 선택한 정보
 */
getInfoData: function (typeObj, targetObj) {
    targetObj = targetObj || {
        selectedPartId: 'selectedList', // default id 값 : Selected Parts (선택 목록의 목수)
        modelModeName: 'modelTypeList', // default name 값 : Model Mode (체크박스 value 정보)
        mountingName: 'mountingTypeList', // default name 값 : Mounting (체크박스 value 정보)
        solderName: 'solderTypeList' // default name 값 : Solder (체크박스 value 정보)
    };
    var semChart = SEM.chart;
    var info = {}; // ajax request data
    var simulationType = {
        'Z': 'TEMPDC',
        'R': 'TEMPDC',
        '|X|': 'TEMPDC',
        'Z|R': 'TEMPDC',
        'C': 'TEMPDC',
        'L': 'TEMPDC',
        'Q': 'TEMPDC',
        'DF': 'TFMPDC'
    };
    ...
}
```

The status bar at the bottom indicates 'Line 2341, Column 52'. The bottom navigation bar includes Console, What's New, Search, and a Filter section.

Chrome Dev Tools > Breakpoints

The screenshot shows the Chrome DevTools interface with the 'Sources' tab selected. The left sidebar lists files: polyfill.js, common.js, simulation-tool.do, jquery-1.11.3.min.js, and common_chart.js. The code editor displays common_chart.js with several breakpoints set, indicated by red numbers (e.g., 2290, 2291, 2308) next to specific lines of code. A red box highlights the 'Breakpoints' section in the right-hand sidebar, which contains a list of active breakpoints. One breakpoint is selected, showing the line number 2308 and the corresponding code: `var info = {};`. Other listed breakpoints include 2308 and 2309. The bottom of the screen shows the Console tab is active, displaying the message 'Line 2341, Column 52'.

```
2290     return infoDown;
2291 },
2292 /**
2293 * 차트 그릴 때 필요한 정보 가져오기 - ajax request data
2294 * @function SEM.chart.getInfoData
2295 * @param {string} typeObj 차트 유형
2296 * @param {object} targetObj 정보를 대상
2297 * @return {object} 선택한 정보
2298 */
2299 getInfoData: function (typeObj, targetObj) {
2300     targetObj = targetObj || {
2301         selectedPartId: 'selectedList', // default id 값 : Selected Parts (선택 목록의 목수)
2302         modelModeName: 'modelTypeList', // default name 값 : Model Mode (체크박스 value 정보)
2303         mountingName: 'mountingTypeList', // default name 값 : Mounting (체크박스 value 정보)
2304         solderName: 'solderTypeList' // default name 값 : Solder (체크박스 value 정보)
2305     };
2306     var semChart = SEM.chart;
2307     var info = {};
```

Breakpoints

- common_chart.js:2308
var info = {};
- XHR/fetch Breakpoints

DOM Breakpoints

Global Listeners

Event Listener Breakpoints

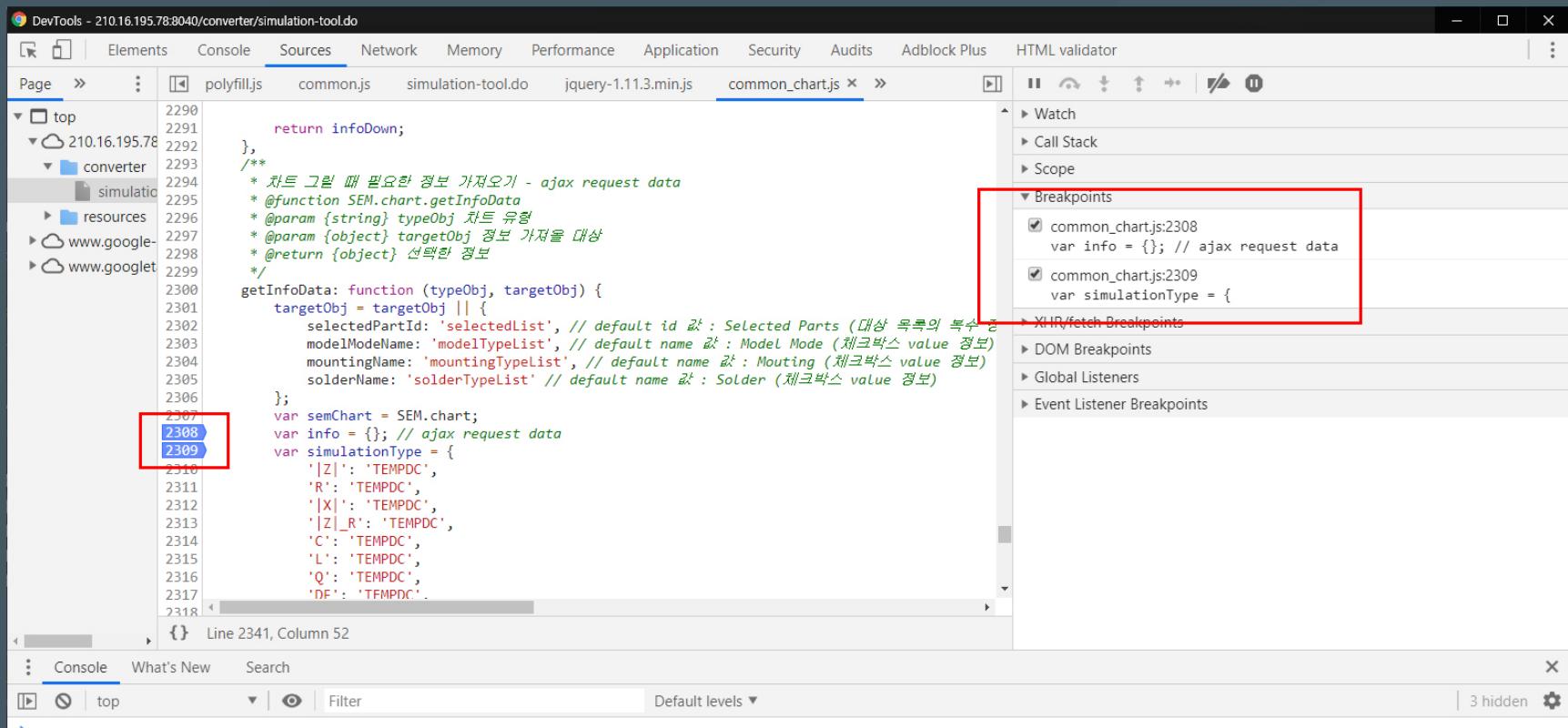
Line 2341, Column 52

Console What's New Search

Default levels ▾

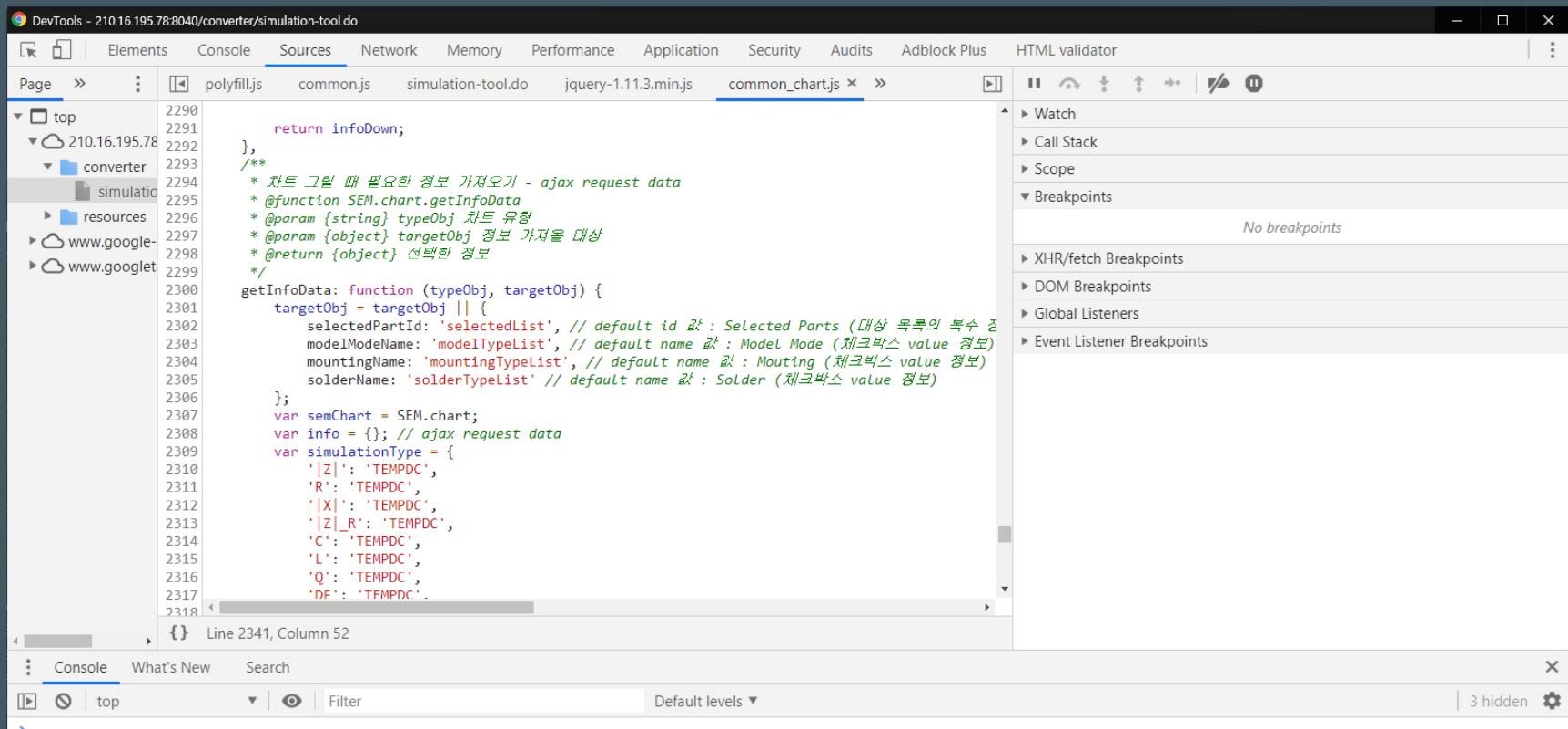
3 hidden

Chrome Dev Tools > Breakpoints



다중 선택, 중단점 사용 여부 선택 가능

Chrome Dev Tools > Breakpoints



The screenshot shows the Chrome DevTools interface with the "Sources" tab selected. The left sidebar lists files: polyfill.js, common.js, simulation-tool.do, jquery-1.11.3.min.js, and common_chart.js. The code editor displays common_chart.js with several comments in Korean. A breakpoint is set on line 2318, which is highlighted in red. The right sidebar shows the "Breakpoints" section with a message "No breakpoints". At the bottom, the console tab is active, showing "Line 2341, Column 52".

```
2290     return infoDown;
2291 },
2292 /**
2293 * 차트 그릴 때 필요한 정보 가져오기 - ajax request data
2294 * @function SEM.chart.getInfoData
2295 * @param {string} typeObj 차트 유형
2296 * @param {object} targetObj 정보를 대상
2297 * @return {object} 선택한 정보
2298 */
2299 getInfoData: function (typeObj, targetObj) {
2300     targetObj = targetObj || {
2301         selectedPartId: 'selectedList', // default id 값 : Selected Parts (선택 목록의 목수)
2302         modelModeName: 'modelTypeList', // default name 값 : Model Mode (체크박스 value 정보)
2303         mountingName: 'mountingTypeList', // default name 값 : Mounting (체크박스 value 정보)
2304         solderName: 'solderTypeList' // default name 값 : Solder (체크박스 value 정보)
2305     };
2306     var semChart = SEM.chart;
2307     var info = {}; // ajax request data
2308     var simulationType = {
2309         'Z': 'TEMPDC',
2310         'R': 'TEMPDC',
2311         '|X|': 'TEMPDC',
2312         'Z|R': 'TEMPDC',
2313         'C': 'TEMPDC',
2314         'L': 'TEMPDC',
2315         'Q': 'TEMPDC',
2316         'DF': 'TFMPDC'
2317     }
2318 }
```





Chrome Dev Tools > Breakpoints





Chrome Dev Tools > Breakpoints



```
arrangeLayer();  
getInfoData();
```



 **Chrome Dev Tools > Breakpoints** 

Resume script execution

Step over next function call

Step into next function call

Step out of current function

Step

Deactivate breakpoints

Pause on exceptions

Blackboxing



Chrome Dev Tools > Blackboxing

The screenshot shows the Chrome Dev Tools interface with the Sources tab selected. The left sidebar lists files: top, 210.16.195.78:8040, converter (with simulation-tool.do selected), resources, www.google-analytics.com, and www.googletagmanager.com. The main pane displays code from common_chart.js, specifically lines 650 to 673. The right pane shows the context menu with options like Dock side, Focus debugger, Hide console drawer, and more.

DevTools - 210.16.195.78:8040/converter/simulation-tool.do

Sources

simulation-tool.do polyfill.js common.js common_chart.js

650 /**
651 * Frequency
652 * 允許한 min 이상, max 이하
653 */
654 freqMin = 0.01;
655 freqMax = 10;
656 if (freqMin > frequency || frequency > freqMax) { // 이상,
657 _htmlItem.push(''Freq.'')
658 _listAddFlag = false;
659 }
660
661 _htmlItem = _htmlItem.join('\n');
662
663 /* 범위를 벗어난 항목이 한개라도 존재하면 팝업내 목록에 표시 */
664 if (!listAddFlag) {
665 _html.push('');
666 _html.push(''<div class="partname">' + _partsName + '</div>'')
667 _html.push(''<div class="condition">' + _partsCondition + '</div>'')
668 _html.push('');
669 }

{ } Line 673, Column 75

Console What's New Search

Console was cleared

Default levels ▾

VM849:1

2 hidden

Dock side

Focus debugger

Hide console drawer Esc

Search Ctrl+Shift+F

Run command Ctrl+Shift+P

Open file Ctrl+P

More tools

Shortcuts

Settings F1

Help

XHR/fetch Breakpoints

DOM Breakpoints

Global Listeners

Event Listener Breakpoints



Chrome Dev Tools > Blackboxing

The screenshot shows the 'Blackboxing' settings page in the Chrome DevTools. The left sidebar lists various settings like 'Preferences', 'Workspace', and 'Blackboxing' (which is selected). The main area is titled 'Framework Blackbox Patterns' and contains a table with three rows:

Pattern	Action
./jquery.*\.js\$	Blackbox
bundle.js	Blackbox
./jqx*.js\$	Blackbox

Below the table is a blue 'Add pattern...' button.



arctan started

" stopped - arctan ✓

{ 1.2700 9.037 847 025
9.037 846 795 com

example (console)

(033) PRO 2

~~1.682147000
1.3476715(-2)~~ 4.615925059(-2)

com ct

2.130476415

2.130676415

=====

Relays 6-2 in 033 failed special sped test

in relay

" 10.000 test

example1

Started Cosine Tape (Sine check)
example2 Mult + Adder Test.



Relay #70 Panel F
(moth) in relay.

First actual case of bug being found.

arctangent started.

closed down.

참고

git블로그

github

END

