

# Table of Contents

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## Purpose of this Faceted Collection

This faceted collection shows a list of Motorcycles. It could serve the purpose of buying new and used bikes, like for example the websites: bikesales & gumtree.

## Table of Items

\*Note: This table has been reduced in size here for the sake of simplicity. The assets/server-file.csv has the full 50 row table. Most of the screenshots use this.

Manufacturer	Description	Model	Year	Colour
Suzuki	Born on the racetrack and raised on the street, the MY19 GSX-S1000 is derived...	GSXS1000Z	2018	Black
Yamaha	An all-new YZF-R1 for the 2007 model year was...	YZF-R1	2008	Blue
Kawasaki	There aren't many motorcycles that can go head to head with success...	ER6NL	2013	Green
Honda	The 'Custom' variant, introduced in 1979, had a smaller, narrower tank...	CX500C	1981	Blue
Yamaha	Much more than just another trail bike, WR250R is distilled from...	WR250R	2008	White
Buell	The Buell Ulysses XB12X debuted in July 2005. It had seating, ergonomics...	XB1200	2005	Black
BMW	10 years since the original game-changing S1000RR impressed so mightily...	S1000RR	2019	White
Aprillia	Introducing the RSV4 1100 Factory, the latest evolution in the RSV4 family...	RSV4	2019	Red
Ducati	It is called Panigale V4 and it marks a new and important chapter in Ducati's history...	Panigale V4	2019	Red
Suzuki	Suzuki DRZ400SM 2005 Motard Motorbike. Low Kms...	DRZ400SM	2005	Black
Ducati	The new Monster 1200 fully embodies those values that have seen bikers' hearts...	Monster 1200	2019	Red
Triumph	Inspired by the iconic '59 Bonneville, the T100 motorbikes are modern...	Bonneville T100	2019	Black
Triumph	The new top spec Street Triple RS and new Street Triple S...	Street Triple RS	2020	Black
Triumph	Faster, sharper, sweeter. Lap times tumble, twisty roads are tamed...	Daytona	2015	White
Suzuki	Firebrand custom Hayabusa 2004. Low kms. Extended swing arm...	Hayabusa	2004	Red
Honda	This bike presents in stunning condition. Top box and dealer warranty...	CB500XA	2015	Black
BMW	2010 BMW R1200RT SE Compliance 2010 first registered 2011, 84,000km	1200RT SE	2010	Silver

## Source code for filtering the table

90% of what's in scripts/utils.js is used on just one call of the filterTable function, but here it is:

```
/**
 * Store an object in session storage. Automatically
 * stringifies the object before hand.
 * @param {String} key
 * @param {Object} object
 */
function sessionSet (key, object) {
  sessionStorage.setItem(key, JSON.stringify(object));
}

/**
 * Retrieve an object from session storage. Automatically
 * parses the object before hand.
 * @param {String} key
 */
function sessionGet (key) {
  return JSON.parse(sessionStorage.getItem(key));
}

/**
 * Store an object in local storage. Automatically
 * stringifies the object before hand.
 * @param {String} key
 * @param {Object} object
 */
function localSet (key, object) {
  localStorage.setItem(key, JSON.stringify(object));
}

/**
 * Retrieve an object from session storage. Automatically
 * parses the object before hand.
 * @param {String} key
 */
function localGet (key) {
```

```
    return JSON.parse(localStorage.getItem(key));
}

/**
 * Returns an object containing counts of each property in the array of
 items.
 * @param {VariableItem[]} items
 */
function groupBy (items) {
  if (!items) return null;
  let counts = {}; // will be a 2D map
  for (const item of items) {
    for (const key in item) {
      // init 1st layer key:
      if (!counts[key])
        counts[key] = {};

      // init count 2nd layer key:
      const value = item[key];
      if (!counts[key][value])
        counts[key][value] = 1;
      else
        counts[key][value]++;
    }
  }

  return counts;
}

/**
 * Loads the "mainView" div with a table that contains the items.
 * @param {VariableItem[]} items OPTIONAL. Pass in the items to display
 in the table.
 * If left undefined, defaults to using the full stored items array.
 */
function loadTable (items = sessionGet(env.STORAGE_ITEMS_KEY)) {
  const mainView = document.getElementById('mainView');
  const table = document.createElement('table');
  const keyTypes = sessionGet(env.STORAGE_KEY_TYPES_KEY);
```

```

// Insert column headers:
{
    const row = table.insertRow();
    row.id = 'tableHeaderRow';
    for (const {key} of keyTypes) {
        const cell = row.insertCell();
        cell.innerHTML = `${key}</b>`;
        cell.id = 'tableHeaderCell';
    }
}

// Insert row values:
for (const item of items) {
    const row = table.insertRow();
    for (const key in item) {
        const cell = row.insertCell();
        cell.innerHTML = item[key];
        cell.id = 'tCell';
    }
}

mainView.innerHTML = '';
mainView.appendChild(table);
}

/**
 * Loads the "sidebar" div with fieldsets that correspond to what is
 * stored in keyTypes.
 * The fieldsets themselves appear in the order of which they appear in
 * the keyTypes array.
 * @param {*} filteredItems OPTIONAL. Pass in a filtered array of items
 * that is
 * displayed in the table. Is used for determining what to display in
 * each fieldset
 * and the counts in a String keyType. If left undefined will use a the
 * entire
 * items array in storage.
 */
function loadSidebar (filteredItems = null) {
    const keyTypes = sessionGet(env.STORAGE_KEY_TYPERES_KEY);

```

```

const items = sessionGet(env.STORAGE_ITEMS_KEY);
const mappedItems = groupBy(items)
const filteredMappedItems = groupBy(filteredItems);
const sidebar = document.getElementById('sidebar');

// Remove all fieldsets from sidebar:
for (let i = 0; i < sidebar.children.length; i++) {
  const child = sidebar.children[i];
  if (child.tagName === 'FIELDSET') {
    sidebar.removeChild(child);
    i--;
  }
}

for (const {key, type} of keyTypes) {
  const fieldset = document.createElement('fieldset');
  const legend = document.createElement('legend');
  legend.innerHTML = key;
  fieldset.appendChild(legend);
  fieldset.id = `${key}-${type}`;

  switch (type) {
    case 'String':
      // Is just for displaying these checkboxes in a sorted order:
      const sortedMappedItemsByKey =
Object.keys(mappedItems[key]).sort((aKey, bKey) => {
  // Sort by count descending, then alphabetically if count is
equal:
  let aCount = mappedItems[key][aKey];
  let bCount = mappedItems[key][bKey];
  if (filteredMappedItems) {
    aCount = filteredMappedItems[key] &&
filteredMappedItems[key][aKey]
      ? filteredMappedItems[key][aKey]
      : 0;
    bCount = filteredMappedItems[key] &&
filteredMappedItems[key][bKey]
      ? filteredMappedItems[key][bKey]
      : 0;
  }
})

```

```

    const countDifference = bCount - aCount;
    if (countDifference === 0) return aKey > bKey;
    else return countDifference;
  });

  // Create checkboxes:
  for (const mappedKey of sortedMappedItemsByKey) {
    let count = mappedItems[key][mappedKey];
    if (filteredMappedItems)
      count = filteredMappedItems[key] &&
filteredMappedItems[key][mappedKey]
      ? filteredMappedItems[key][mappedKey]
      : 0;
    const checkbox = document.createElement('input');
    checkbox.type = 'checkbox';
    const label = document.createElement('label');
    label.for = checkbox.id = `${mappedKey}Checkbox`;
    label.id = `${mappedKey}Label`;
    label.innerHTML = `${mappedKey} - <b>${count}</b>`;
    fieldset.appendChild(checkbox);
    fieldset.appendChild(label);
    fieldset.appendChild(document.createElement('br'));
  }
  break;
case 'Description':
  const textInput = document.createElement('input');
  textInput.type = 'text';
  textInput.id = `${key}TextInput`;
  textInput.className = 'textInput';
  textInput.placeholder = 'Enter key word(s)';
  fieldset.appendChild(textInput);
  break;
case 'Number' :
  const upperBound = document.createElement('input');
  const lowerBound = document.createElement('input');
  lowerBound.type = upperBound.type = 'text';
  lowerBound.className = upperBound.className = 'textInput';
  upperBound.id = `${key}UpperBound`;
  lowerBound.id = `${key}LowerBound`;
  upperBound.placeholder = 'Upper bound';

```

```

        lowerBound.placeholder = 'Lower bound';
        fieldset.appendChild(upperBound);
        fieldset.appendChild(document.createElement('br'));
        fieldset.appendChild(lowerBound);
        break;
    }

    sidebar.appendChild(fieldset);
}
}

/**
 * Filter the table in the "mainView" div, update the sidebar with new
 * filtered fieldset values,
 * store new filter or bump previously new filter to first index.
 */
async function filterTable () {
    const keyTypes = sessionGet(env.STORAGE_KEY_TYPES_KEY);

    // Create filters:
    const filters = [];
    for (const {key, type} of keyTypes) {
        let filter = {key, type};
        const fieldset = document.getElementById(`${key}-${type}`);
        switch (type) {
            case 'String':
                filter.checked = [];
                for (const checkbox of fieldset.children) {
                    if (checkbox.type === 'checkbox' && checkbox.checked) {
                        filter.checked.push(checkbox.id.replace(/checkbox/i, ''));
                        filters.push(filter);
                    }
                }
                break;
            case 'Description':
                const keyWords =
document.getElementById(`${key}TextInput`).value
                    .trim()
                    .replace(/,| {2,}/g, ' ') // replace any , or series of more
than two spaces, with a single space

```



```

        .split(' ')
        .filter(v => v);
    if (keyWords.length) {
        filter.keyWords = keyWords;
        filters.push(filter);
    }
    break;
case 'Number':
    let wasInvalidNumber = false;
    ['upperBound', 'lowerBound'].forEach(bound => {
        const textInput =
document.getElementById(`${key}${bound.charAt(0).toUpperCase() +
bound.substring(1)}`);
        const str = textInput.value.trim();
        const num = parseFloat(str);
        if (!isNaN(num)) {
            filter[bound] = num;
            filters.push(filter);
        } else if (str !== '') {
            wasInvalidNumber = true;
            const oldPlaceholder = textInput.placeholder;
            const oldClass = textInput.className;
            const oldStyle = textInput.style;
            textInput.placeholder = `Invalid number`;
            textInput.className += ' errorShaking';
            textInput.value = '';
            // Remove invalid textInput alert after it's clicked on:
            textInput.onclick = () => {
                textInput.placeholder = oldPlaceholder;
                textInput.className = oldClass;
                textInput.style = oldStyle;
                textInput.onclick = null;
            };
        }
    });
    // Stop and display error if an invalid input was used in a
Number bound field.
    if (wasInvalidNumber)
        return;
    break;

```

```

    }
}

// Stop if no filters were used.
if (!filters.length)
    return;

const filterIndex = getFilterIndexAndLength().index;
// Store filters in localStorage if the selected filter index is
unselected ('-' is unselected):
if (filterIndex === '-') {
    const storedFilters = localGet(env.STORAGE_FILTERS_KEY);
    if (!storedFilters || !storedFilters.length) {
        localSet(env.STORAGE_FILTERS_KEY, [filters]);
    } else {
        storedFilters.unshift(filters);
        while (storedFilters.length > env.MAX_STORED_FILTERS)
            storedFilters.pop();
        localSet(env.STORAGE_FILTERS_KEY, storedFilters);
    }
} else { // A previous filter was selected:
    // Bump this previous filter to the first index
    const storedFilters = localGet(env.STORAGE_FILTERS_KEY);
    storedFilters.splice(filterIndex - 1, 1);
    storedFilters.unshift(filters);
    localSet(env.STORAGE_FILTERS_KEY, storedFilters);
}

// Create filteredItems:
const filteredItems = sessionGet(env.STORAGE_ITEMS_KEY)
    .filter(item => {
        for (const filter of filters) {
            const itemValue = item[filter.key];
            switch (filter.type) {
                case 'String':
                    if (!filter.checked.includes(itemValue)) {
                        return false;
                    }
                    break;
                case 'Description':

```

```
        for (const keyWord of filter.keyWords) {
            if
(!itemValue.toLowerCase().includes(keyWord.toLowerCase()))
                return false;
        }
        break;
        case 'Number':
            if (itemValue < filter.lowerBound || itemValue >
filter.upperBound)
                return false;
            break;
        }
    }
    return true;
});

loadTable(filteredItems);
loadSidebar(filteredItems);
updateFilterStorageText(1);
updateFilterValues(1);
}

/**
 * Updates sidebar's filter values, as in checks checkboxes, fills in
text inputs, etc,
 * with what the filter has, that is stored at filterIndex.
 * @param {Number} filterIndex
 */
function updateFilterValues (filterIndex) {
    if (!filterIndex)
        return;

    // Reset all input tags:
    for (const input of document.getElementsByTagName('input')) {
        if (input.type === 'text')
            input.value = '';
        else if (input.type === 'checkbox')
            input.checked = false;
    }
}
```

```

const filters = localGet(env.STORAGE_FILTERS_KEY)[filterIndex - 1];
for (const filter of filters) {
  switch (filter.type) {
    case 'String':
      filter.checked
        .forEach(key => {
          const checkbox = document.getElementById(`${key}Checkbox`);
          checkbox.checked = true;
          checkbox.className += ' pulse';
          setTimeout(() => {
            checkbox.className = checkbox.className.replace(/
*pulse/i, '');
            }, 1300);
          });
          break;
        case 'Description':
          const textInput =
document.getElementById(`${filter.key}TextInput`)
          textInput.value = filter.keyWords.join(' ');
          textInput.className += ' pulse';
          setTimeout(() => {
            textInput.className = textInput.className.replace(/ *pulse/i,
            '');
            }, 1300);
          break;
        case 'Number':
          ['lowerBound', 'upperBound'].forEach(boundKey => {
            if (filter[boundKey]) {
              const bound = document

.getElemenById(`${filter.key}${boundKey.charAt(0).toUpperCase() +
boundKey.substring(1)}`);
              bound.value = filter[boundKey];
              bound.className += ' pulse';
              setTimeout(() => {
                bound.className = bound.className.replace(/ *pulse/i,
                '');
                }, 1300);
              }
            });

```

```

        break;
    }
}

/**
 * Retrieves the current index and length that is displayed at the top
left corner of the screen.
 * Example: Load a previous filter: -/3. === { Index: "-", length: 3 }
 */
function getFilterIndexAndLength () {
    const filterStorageText =
document.getElementById('filterStorageText');
    const str = filterStorageText.innerHTML;
    return {
        index: str.substring(0, str.indexOf('/')),
        length: parseFloat(str.substring(str.indexOf('/') + 1))
    };
}

/**
 * Updates the text that is displayed at the top left corner of the
screen.
 * @param {String|Number} filterIndex OPTIONAL. Set the index to this,
 * defaults to none selected, i.e. "-".
 */
function updateFilterStorageText (filterIndex = '-') {
    const filterStorageText =
document.getElementById('filterStorageText');
    const storedFilters = localGet(env.STORAGE_FILTERS_KEY);
    filterStorageText.innerHTML = `${filterIndex}/${storedFilters ?
storedFilters.length : 0}`;
}

```

# Test Cases for Requirements

Almost all of the following screenshots are taken using the above table of items located in assets/server-file-report-version.csv. This is adequate enough to show everything needed to prove the requirements have been met. All screenshots are located in screenshots directory.

## Standard requirements:

1. Supports three categorical attributes. Note a numeric attribute can be converted into a categorical one by replacing a number with an interval:

Filter

Reset

**Manufacturer**

- ☐ Suzuki - (3)
- ☐ Triumph - (3)
- ☐ BMW - (2)
- ☐ Ducati - (2)
- ☐ Honda - (2)
- ☐ Yamaha - (2)
- ☐ Aprilia - (1)
- ☐ Buell - (1)
- ☐ Kawasaki - (1)

Description

Enter key word(s)

**Model**

- ☐ 1200RT SE - (1)
- ☐ Bonneville T100 - (1)
- ☐ CB500XA - (1)
- ☐ CX500C - (1)
- ☐ DRZ400SM - (1)
- ☐ Daytona - (1)
- ☐ ER6NL - (1)
- ☐ GSXS1000Z - (1)
- ☐ Hayabusa - (1)
- ☐ Monster 1200 - (1)
- ☐ Panigale V4 - (1)
- ☐ RSV4 - (1)
- ☐ S1000RR - (1)
- ☐ Street Triple RS - (1)
- ☐ WR250R - (1)
- ☐ XB1200 - (1)
- ☐ YZF-R1 - (1)

Year

Upper bound

Lower bound

**Colour**

- ☐ Black - (6)
- ☐ Red - (4)
- ☐ White - (3)
- ☐ Blue - (2)
- ☐ Green - (1)
- ☐ Silver - (1)

1-three categorical attributes.jpg

☐ BMW - (4)

☐ Ducati - (2)

☐ Honda - (2)

☐ Yamaha - (2)

☐ Aprilia - (1)

☐ Buell - (1)

☐ Kawasaki - (1)

Description

Enter key word(s)

**Model**

- ☐ 1200RT SE - (1)
- ☐ Bonneville T100 - (1)
- ☐ CB500XA - (1)
- ☐ CX500C - (1)
- ☐ DRZ400SM - (1)
- ☐ Daytona - (1)
- ☐ ER6NL - (1)
- ☐ GSXS1000Z - (1)
- ☐ Hayabusa - (1)
- ☐ Monster 1200 - (1)
- ☐ Panigale V4 - (1)
- ☐ RSV4 - (1)
- ☐ S1000RR - (1)
- ☐ Street Triple RS - (1)
- ☐ WR250R - (1)
- ☐ XB1200 - (1)
- ☐ YZF-R1 - (1)

**Year**

- ☐ 2019 - (5)
- ☐ 2005 - (2)
- ☐ 2008 - (2)
- ☐ 2015 - (2)
- ☐ 1981 - (1)
- ☐ 2004 - (1)
- ☐ 2010 - (1)
- ☐ 2013 - (1)
- ☐ 2018 - (1)
- ☐ 2020 - (1)

**Colour**

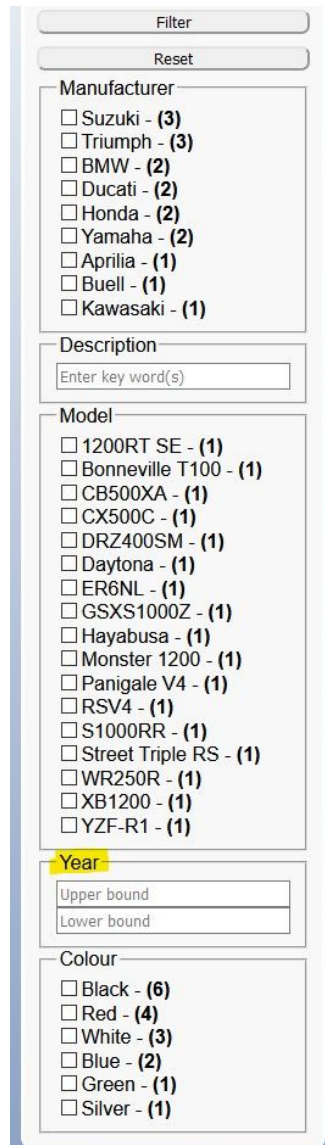
- ☐ Black - (6)
- ☐ Red - (4)
- ☐ White - (3)
- ☐ Blue - (2)
- ☐ Green - (1)
- ☐ Silver - (1)

1-numeric attribute can be converted to categorical.jpg

Manufacturer, Model and Colour are the three categorical attributes. Categorical attributes are referenced as a "String" type of filter in the code. This type of filter is a list of input tags with attribute type="checkbox".

The second screenshot shows a numeric attribute displayed as a categorical one instead.

2. Supports one numeric attribute. This attribute will be filtered using two input fields (or similar) that allow a user to enter a numeric range as a lower bound and upper bound.



The image shows a vertical filter interface for motorcycles. It has a 'Filter' button at the top, followed by a 'Reset' button. Below these are five filter sections: 'Manufacturer' with 8 options (Suzuki, Triumph, BMW, Ducati, Honda, Yamaha, Aprilia, Buell, Kawasaki), 'Description' with a text input field, 'Model' with 18 options (1200RT SE, Bonneville T100, CB500XA, CX500C, DRZ400SM, Daytona, ER6NL, GSXS1000Z, Hayabusa, Monster 1200, Panigale V4, RSV4, S1000RR, Street Triple RS, WR250R, XB1200, YZF-R1), 'Year' with 'Upper bound' and 'Lower bound' input fields, and 'Colour' with 6 options (Black, Red, White, Blue, Green, Silver). Each option is preceded by a checkbox and followed by a count in parentheses.

Filter

Reset

Manufacturer

- ☐ Suzuki - (3)
- ☐ Triumph - (3)
- ☐ BMW - (2)
- ☐ Ducati - (2)
- ☐ Honda - (2)
- ☐ Yamaha - (2)
- ☐ Aprilia - (1)
- ☐ Buell - (1)
- ☐ Kawasaki - (1)

Description

Enter key word(s)

Model

- ☐ 1200RT SE - (1)
- ☐ Bonneville T100 - (1)
- ☐ CB500XA - (1)
- ☐ CX500C - (1)
- ☐ DRZ400SM - (1)
- ☐ Daytona - (1)
- ☐ ER6NL - (1)
- ☐ GSXS1000Z - (1)
- ☐ Hayabusa - (1)
- ☐ Monster 1200 - (1)
- ☐ Panigale V4 - (1)
- ☐ RSV4 - (1)
- ☐ S1000RR - (1)
- ☐ Street Triple RS - (1)
- ☐ WR250R - (1)
- ☐ XB1200 - (1)
- ☐ YZF-R1 - (1)

Year

Upper bound

Lower bound

Colour

- ☐ Black - (6)
- ☐ Red - (4)
- ☐ White - (3)
- ☐ Blue - (2)
- ☐ Green - (1)
- ☐ Silver - (1)

2-one numeric attribute.jpg

Year is the one numeric attribute. In the code, it is referenced as a "Number" type of filter. Number filters have an upper and lower bound which are both input tags with attribute type="text". Both bounds are inclusive, meaning, if you type in 2010 for the upper bound, it filters by  $\leq 2010$ .

3. The initial state for the web page is: all filters are unset and the entire table of items (i.e. the whole collection) is shown:

The following screenshot shows the webpage as is, when it first loads. All filters are unset and the full list of items is shown.

The screenshot shows a web application for listing motorcycles. On the left is a sidebar with filters for Manufacturer, Description, Model, Year, and Colour. The main area displays a table of motorcycles with columns for Manufacturer, Description, Model, Year, and Colour.

**Filters:**

- Manufacturer:** Suzuki (3), Triumph (3), BMW (2), Ducati (2), Honda (2), Yamaha (2), Aprilia (1), Buell (1), Kawasaki (1)
- Description:** Enter key word(s)
- Model:** 1200RT SE (1), Bonneville T100 (1), CB500XA (1), CX500C (1), DRZ400SM (1), Daytona (1), ER6N (1), GSXS1000Z (1), Hayabusa (1), Monster 1200 (1), Panigale V4 (1), RSV4 (1), S1000RR (1), Street Triple RS (1), WR250R (1), XB1200 (1), YZF-R1 (1)
- Year:** Upper bound, Lower bound
- Colour:** Black (6), Red (4), White (3), Blue (2), Green (1), Silver (1)

**Motorcycle Table:**

Manufacturer	Description	Model	Year	Colour
Suzuki	Born on the racetrack and raised on the street, the MY19 GSX-S1000 is derived from the legendary, championship-winning GSX-R1000. The new GSX-S lineup carries the spirit of the Suzuki GSX-R to the street, with shared technology and performance packaged into a chassis designed specifically for street riding comfort.	GSXS1000Z	2018	Black
Yamaha	An all-new YZF-R1 for the 2007 model year was announced on 8 October 2006. It had an all-new inline four-cylinder engine, going back to a more conventional four-valves per cylinder, rather than Yamaha's trade mark five-valve Genesis layout.	YZF-R1	2008	Blue
Kawasaki	There aren't many motorcycles that can go head to head with success with the Kawasaki ER-6nL. This muscular mechanical beast is wrapped in an aggressive street-fighter skin which underlines its unstoppable character.	ER6N	2013	Green
Honda	The 'Custom' variant, introduced in 1979, had a smaller, narrower tank and buckhorn handlebars. The headlight and gauges were similar to the CX500 Deluxe. Turn signals were now mounted along the fork tubes, below the level of the headlight. 1982 was the last model year for the CX500. In 1983 it was bumped up to 673 cc and became the CX650. The CX650's styling was different, and the engine was painted black instead of plain aluminium.	CX500C	1981	Blue
Yamaha	Much more than just another trail bike, WR250R is distilled from Yamaha's world-dominating off-road know-how with emphasis on rugged reliability. This small capacity machine makes for a superb lightweight adventure tourer, fully capable of tackling a desert crossing and not just the cut and thrust of the weekday commute.	WR250R	2008	White
Buell	The Buell Ulysses XB12X debuted in July 2005. It had seating, ergonomics, and long-travel suspension that are suited for use on unpaved and rough roads. Buell advertised the Ulysses as 'the world's first adventure sportbike.'	XB1200	2005	Black
BMW	10 years since the original game-changing S1000RR impressed so mightily in its debut year, the 2019 model, marking the 3rd new generation in the family, has come on leaps and bounds including the riddance of those asymmetrical headlights – not everyone's cup of tea. Not only does the overall look get upgraded while still retaining the recognisable silhouette, but immense improvements to the engine, frame, suspension, electronics and rider control systems warrant the 'new from the ground up' comment from the German marque.	S1000RR	2019	White
Aprilia	Introducing the RSV4 1100 Factory, the latest evolution in the RSV4 family, a range with impeccable lineage in its superbike history which includes seven world titles. Add racing world technology and a wealth of experience developed in MotoGP and the result is an exceptional bike both on the road and on the track.	RSV4	2019	Red
Ducati	It is called Panigale V4 and it marks a new and important chapter in Ducati's history, a 'symphony' of performance and emotions that's 100% Italian. Panigale V4 is the first mass-produced Ducati motorcycle to be equipped with a 4-cylinder engine, closely derived from the Desmosedici of the MotoGP.	Panigale V4	2019	Red
Suzuki	Suzuki DRZ400SM 2005 Motard Motorbike. Low Kms. Very good condition. Always garaged	DRZ400SM	2005	Black
Ducati	The new Monster 1200 fully embodies those values that have seen bikers' hearts race for over 20 years. A sports icon that is totally renewed while staying faithful to the values that have made it unique: even more beautiful, even more technological, still unmistakably Monster.	Monster 1200	2019	Red
Triumph	Inspired by the iconic '59 Bonneville, the T100 motorbikes are modern classics with a distinctive character that incorporates more of the original Bonneville DNA, along with many of the stunning finishes, features, and details of the larger Bonneville T120 and T120 Black.	Bonneville T100	2019	Black
Triumph	The new top spec Street Triple RS and new Street Triple S have advanced the next generation of Triumph's game-changing middleweight roadster with an all-new aggressive styling and attitude.	Street Triple RS	2020	Black
Triumph	Faster, sharper, sweeter. Lap times tumble, twisty roads are tamed, the toughest corners are conquered by the world's most thrilling high-performance middleweight sports bike.	Daytona	2015	White
Suzuki	Firebrand custom Hayabusa 2004. Low kms. Extended swing arm, Bricks custom exhaust, 240mm rear tyre, neon lights, custom fairings, chrome everywhere. Comes with full engineering certificates. A great ride, amazing looking and a real head turner	Hayabusa	2004	Red
Honda	This bike presents in stunning condition. Top box and dealer warranty... this is great package.	CB500XA	2015	Black
BMW	2010 BMW R1200RT SE Compliance 2010 first registered 2011, 84,000 Km, \$17,000. Selling for a family member. Is currently registered in W.A. but comes with a QLD Roadworthy and Safety.	1200RT SE	2010	Silver

unfiltered page.jpg

4. The web page shows a filter for each categorical attribute. A filter could be implemented as a list of radio buttons or a list of checkboxes or some equivalent, where each element in the list is for an attribute value. For example, for an attribute colour filter the list could be for 'red', 'green' etc. Note the user must be able to see all values at a glance without any keyboard or mouse interaction, so a dropdown menu will not be acceptable.

See requirement 1's answer and screenshots.

5. Each filter also shows counts for each attribute value. For example, 'red (5)', 'green (8)' which indicates there are 5 red items and 8 green items in the filtered table.

See requirement 1's answer and screenshots.



6. The web page supports filtering by multiple attributes. A user can make a selection in one or more filters then click a filter button. After the click the item table will be redisplayed to only show items that meet the filter conditions. The counts next to each attribute value in each filter are updated after the click.

The following 3 screenshots shows that any combination of multiple attributes can be used. Also to note: the checkboxes are sorted by their new counts in descending order. Equal counts are then sorted alphabetically by the label name of that checkbox.

Load a previous filter:

<

1/4

>

Filter

Reset

Manufacturer

☒ Yamaha - (2)
 ☒ Kawasaki - (1)
 ☐ Aprilia - (0)
 ☐ BMW - (0)
 ☐ Buell - (0)
 ☐ Ducati - (0)
 ☐ Honda - (0)
 ☐ Suzuki - (0)
 ☐ Triumph - (0)

Description

Enter key word(s)

Model

☐ ER6NL - (1)
 ☐ WR250R - (1)
 ☐ YZF-R1 - (1)
 ☐ 1200RT SE - (0)
 ☐ Bonneville T100 - (0)
 ☐ CB500XA - (0)
 ☐ CX500C - (0)
 ☐ DRZ400SM - (0)
 ☐ Daytona - (0)
 ☐ GSXS1000Z - (0)
 ☐ Hayabusa - (0)
 ☐ Monster 1200 - (0)
 ☐ Panigale V4 - (0)
 ☐ RSV4 - (0)
 ☐ S1000RR - (0)
 ☐ Street Triple RS - (0)
 ☐ XB1200 - (0)

Year

Upper bound

Lower bound

Colour

☐ Blue - (1)
 ☐ Green - (1)
 ☐ White - (1)
 ☐ Black - (0)
 ☐ Red - (0)
 ☐ Silver - (0)

Manufacturer:	Description:	Model:	Year:	Colour:
Yamaha	An all-new YZF-R1 for the 2007 model year was announced on 8 October 2006. It had an all-new inline four-cylinder engine, going back to a more conventional four-valves per cylinder, rather than Yamaha's trade mark five-valve Genesis layout.	YZF-R1	2008	Blue
Kawasaki	There aren't many motorcycles that can go head to head with success with the Kawasaki ER-6nL. This muscular mechanical beast is wrapped in an aggressive street-fighter skin which underlines its unstoppable character.	ER6nL	2013	Green
Yamaha	Much more than just another trail bike, WR250R is distilled from Yamaha's world-dominating off-road know-how with emphasis on rugged reliability. This small capacity machine makes for a superb lightweight adventure tourer, fully capable of tackling a desert crossing and not just the cut and thrust of the weekday commute.	WR250R	2008	White

6-multiple attributes1.jpg

Load a previous filter:

<

1/5

>

Filter

Reset

Manufacturer

☒ Honda - (1)

☐ Aprilia - (0)

☒ BMW - (0)

☐ Buell - (0)

☒ Ducati - (0)

☐ Kawasaki - (0)

☐ Suzuki - (0)

☐ Triumph - (0)

☒ Yamaha - (0)

Description

Enter key word(s)

Model

☐ CB500XA - (1)

☐ 1200RT SE - (0)

☐ Bonneville T100 - (0)

☐ CX500C - (0)

☐ DRZ400SM - (0)

☐ Daytona - (0)

☐ ER6NL - (0)

☐ GSXS1000Z - (0)

☐ Hayabusa - (0)

☐ Monster 1200 - (0)

☐ Panigale V4 - (0)

☐ RSV4 - (0)

☐ S1000RR - (0)

☐ Street Triple RS - (0)

☐ VWR250R - (0)

☐ XB1200 - (0)

☐ YZF-R1 - (0)

Year

Upper bound

Lower bound

Colour

☒ Black - (1)

☐ Blue - (0)

☐ Green - (0)

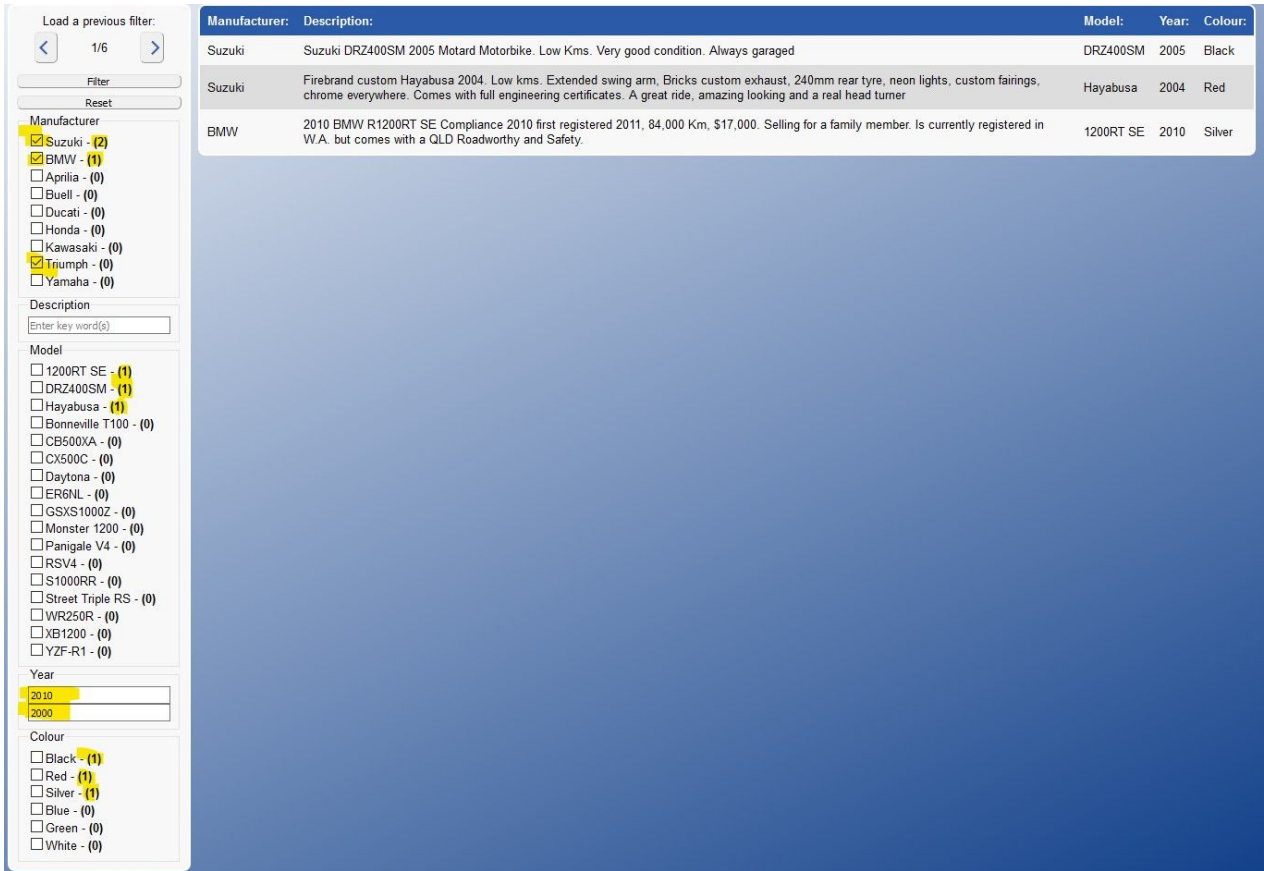
☐ Red - (0)

☐ Silver - (0)

☐ White - (0)

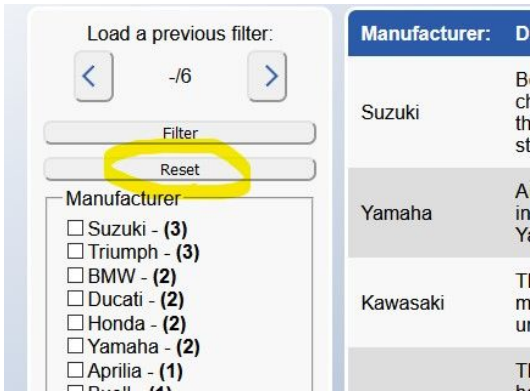
Manufacturer:	Description:	Model:	Year:	Colour:
Honda	This bike presents in stunning condition. Top box and dealer warranty... this is great package.	CB500XA	2015	Black

6-multiple attributes2.jpg



6-multiple attributes3.jpg

7. There will be a Reset button that clears all filters.



The button is located under the filter button in the top left corner of the webpage.

8. The item collection will be loaded from a CSV file that is located on a server. The item collection will contain at least 50 records. A local server is fine.

See assets/server-file.csv for the 50 item collection.

Manufacturer:	Description:	Model:	Year:	Colour:
Suzuki	Born on the racetrack and raised on the street, the MY19 GSX-S1000 is derived from the legendary, championship-winning GSX-R1000. The new GSX-S lineup carries the spirit of the Suzuki GSX-R to the street, with shared technology and performance packaged into a chassis designed specifically for street riding comfort.	GSXS1000Z	2018	Black
Yamaha	An all-new YZF-R1 for the 2007 model year was announced on 8 October 2006. It had an all-new inline four-cylinder engine, going back to a more conventional four-valves per cylinder, rather than Yamaha's trade mark five-valve Genesis layout.	YZF-R1	2008	Blue
Kawasaki	There aren't many motorcycles that can go head to head with success with the Kawasaki ER-6nL. This muscular mechanical beast is wrapped in an aggressive street-fighter skin which underlines its unstoppable character.	ER6nL	2013	Green
Honda	The 'Custom' variant, introduced in 1979, had a smaller, narrower tank and buckhorn handlebars. The headlight and gauges were similar to the CX500 Deluxe. Turn signals were now mounted along the fork tubes, below the level of the headlight. 1982 was the last model year for the CX500. In 1983 it was bumped up to 673 cc and became the CX650. The CX650's styling was different, and the engine was painted black instead of plain aluminium.	CX500C	1981	Blue
Yamaha	Much more than just another trail bike, WR250R is distilled from Yamaha's world-dominating off-road know-how with emphasis on rugged reliability. This small capacity machine makes for a superb lightweight adventure tourer, fully capable of tackling a desert crossing and not just the cut and thrust of the weekday commute.	WR250R	2008	White
Buell	The Buell Ulysses XB12X debuted in July 2005. It had seating, ergonomics, and long-travel suspension that are suited for use on unpaved and rough roads. Buell advertised the Ulysses as 'the world's first adventure sportbike.'	XB1200	2005	Black
BMW	10 years since the original game-changing S1000RR impressed so mightily in its debut year, the 2019 model, marking the 3rd new generation in the family, has come on leaps and bounds including the riddance of those asymmetrical headlights – not everyone's cup of tea. Not only does the overall look get upgraded while still retaining the recognisable silhouette, but immense improvements to the engine, frame, suspension, electronics and rider control systems warrant the 'new from the ground up' comment from the German marque.	S1000RR	2019	White
Aprilia	Introducing the RSV4 1100 Factory, the latest evolution in the RSV4 family, a range with impeccable lineage in its superbike history which includes seven world titles. Add racing world technology and a wealth of experience developed in MotoGP and the result is an exceptional bike both on the road and on the track.	RSV4	2019	Red
Ducati	It is called Panigale V4 and it marks a new and important chapter in Ducati's history, a 'symphony' of performance and emotions that's 100% Italian. Panigale V4 is the first mass-produced Ducati motorcycle to be equipped with a 4-cylinder engine, closely derived from the Desmosedici of the MotoGP.	Panigale V4	2019	Red
Suzuki	Suzuki DRZ400SM 2005 Motard Motorbike. Low Kms. Very good condition. Always garaged	DRZ400SM	2005	Black
Ducati	The new Monster 1200 fully embodies those values that have seen bikers' hearts race for over 20 years. A sports icon that is totally renewed while staying faithful to the values that have made it unique, even more beautiful, even more technological, still unmistakably Monster.	Monster 1200	2019	Red

8-unfiltered page with 50 items.jpg

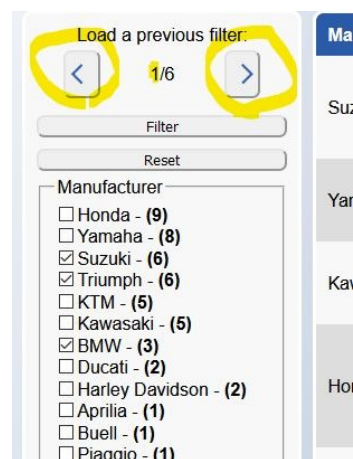
9. Each time a user clicks the filter button, filter settings are saved. Later a user can redo a prior saved filter by selecting from a list of prior filter actions. If the user exits the browser then later revisits the web page, prior filter actions will still be available.

First number is the filter index selected, second is the total number of saved filters. A dash “-” means no filter is selected. Pressing the right arrow will increment the filter index, left will decrement. Going above or below the bounds of the filter array will wrap the index around, e.g. incrementing past 6 will go back to 1. Pressing the Reset button will unselect any filters.

You can only save a filter when none is currently selected. When a filter is currently selected, there is an active on click event that covers all fieldsets. When triggered, this will change the filter index to a dash (unselected), meaning the user wishes to edit a filter and therefore a new filter can now be saved. All of this is to help prevent duplicate filters being saved to easily.

When a new filter is saved, it is pushed on to the first index. When a previously used filter is used, this is also moved to the first index. The maximum number of saved filters can be changed in scripts/env.js.

See screenshots: “6-multiple attributes.jpg” 1, 2 and 3 to see the number of saved filters being incremented.



9-selecting previous filters1.jpg



9-selecting previous filters2.jpg

10. Reasonable use of styles i.e. CSS must be made.

See 8-unfiltered page with 50 items.jpg or unfiltered page.jpg.

11. Numeric inputs must be validated and a reasonable response to web page users made if input is not valid.

11-numeric input validation1.jpg

11-numeric input validation2.jpg

A red error box that shakes briefly will appear when trying to filter using an invalid number input. The two screenshots show the before and after of pressing filter when having an invalid number input.

12. Your report will (i) describe what your faceted collection is and (ii) provide sufficient use cases communicated via screen shots and text descriptions that prove your application meets all the above (and below if advanced) requirements.

See all test cases of all requirements.

13. Your code will be maintainable.

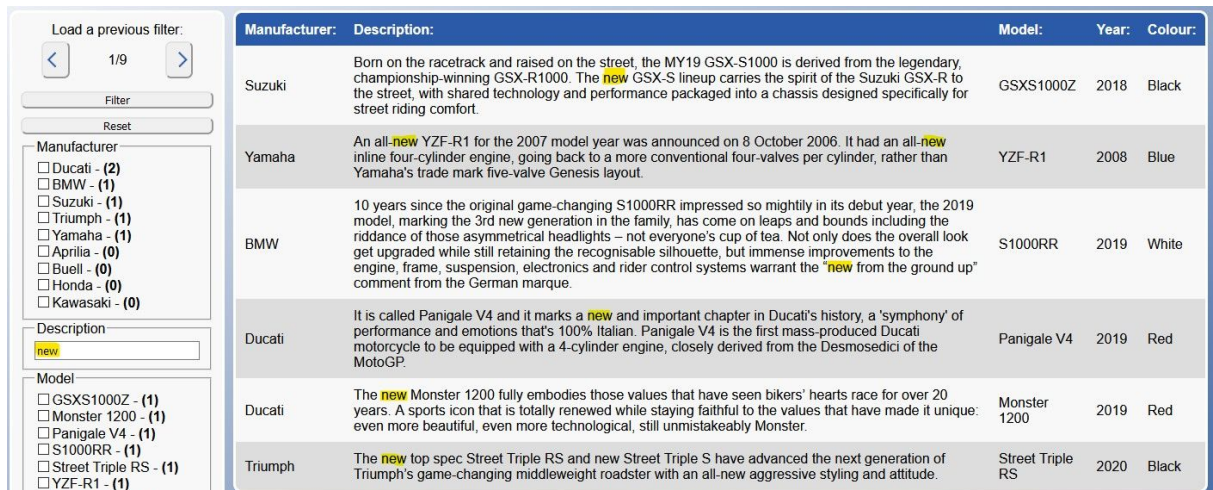
Everything is organised into separate functions. Anything that is needed to be called more than once is made into a function in scripts/utils.js. scripts/index.js is the "on load webpage" code. scripts/env.js is for various environment settings. models/VariableItem.js contains the class that is used for each item. See advanced requirement 3 for more info on VariableItem.js.



## Advanced requirements:

1. Supports an additional text attribute that contains a description i.e. free text. Web page contains an additional filter that supports keyword search over this extra attribute.

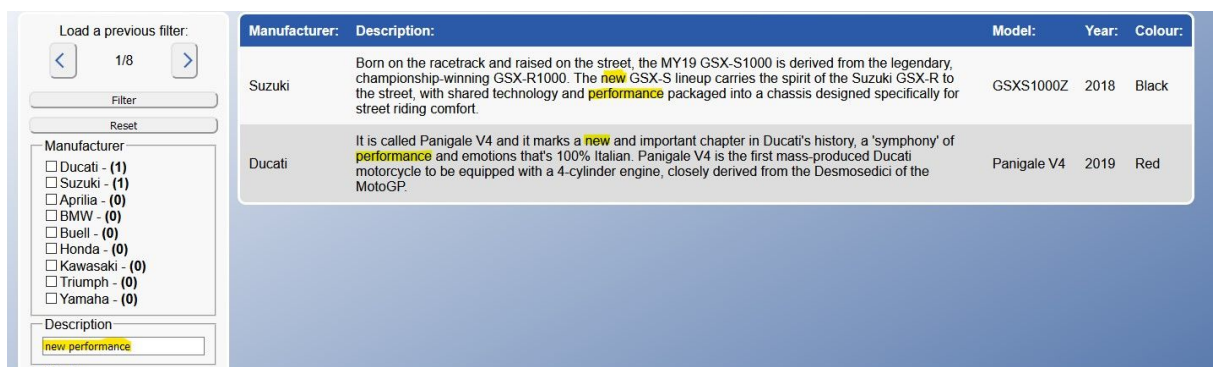
Text attributes are referenced as “Description” filter types. In the text input, keywords are space separated and converted to lowercase. They are ANDed together when searching through an item’s description. So in the second screenshot, only items with descriptions that contain “new” AND “performance” will be shown.



The screenshot shows a search interface with a sidebar on the left and a main table on the right. The sidebar has a 'Filter' button and a 'Reset' button. Under 'Manufacturer', there are checkboxes for Ducati (2), BMW (1), Suzuki (1), Triumph (1), Yamaha (1), Aprilia (0), Buell (0), Honda (0), and Kawasaki (0). Under 'Description', the word 'new' is entered. Under 'Model', there are checkboxes for GSXS1000Z (1), Monster 1200 (1), Panigale V4 (1), S1000RR (1), Street Triple RS (1), and YZF-R1 (1). The main table has columns: Manufacturer, Description, Model, Year, and Colour. It lists several motorcycles, including Suzuki GSXS1000Z, Yamaha YZF-R1, BMW S1000RR, Ducati Panigale V4, Ducati Monster 1200, and Triumph Street Triple RS. The word 'new' is highlighted in yellow in the descriptions of the Suzuki, Yamaha, and Triumph models.

Manufacturer:	Description:	Model:	Year:	Colour:
Suzuki	Born on the racetrack and raised on the street, the MY19 GSX-S1000 is derived from the legendary, championship-winning GSX-R1000. The <b>new</b> GSX-S lineup carries the spirit of the Suzuki GSX-R to the street, with shared technology and performance packaged into a chassis designed specifically for street riding comfort.	GSXS1000Z	2018	Black
Yamaha	An all- <b>new</b> YZF-R1 for the 2007 model year was announced on 8 October 2006. It had an all- <b>new</b> inline four-cylinder engine, going back to a more conventional four-valves per cylinder, rather than Yamaha's trade mark five-valve Genesis layout.	YZF-R1	2008	Blue
BMW	10 years since the original game-changing S1000RR impressed so mightily in its debut year, the 2019 model, marking the 3rd new generation in the family, has come on leaps and bounds including the riddance of those asymmetrical headlights – not everyone's cup of tea. Not only does the overall look get upgraded while still retaining the recognisable silhouette, but immense improvements to the engine, frame, suspension, electronics and rider control systems warrant the <b>new</b> from the ground up" comment from the German marque.	S1000RR	2019	White
Ducati	It is called Panigale V4 and it marks a <b>new</b> and important chapter in Ducati's history, a 'symphony' of performance and emotions that's 100% Italian. Panigale V4 is the first mass-produced Ducati motorcycle to be equipped with a 4-cylinder engine, closely derived from the Desmosedici of the MotoGP.	Panigale V4	2019	Red
Ducati	The <b>new</b> Monster 1200 fully embodies those values that have seen bikers' hearts race for over 20 years. A sports icon that is totally renewed while staying faithful to the values that have made it unique: even more beautiful, even more technological, still unmistakably Monster.	Monster 1200	2019	Red
Triumph	The <b>new</b> top spec Street Triple RS and new Street Triple S have advanced the next generation of Triumph's game-changing middleweight roadster with an all-new aggressive styling and attitude.	Street Triple RS	2020	Black

A1-description attribute1.jpg



The screenshot shows a search interface similar to the first one, but with the word 'new performance' entered in the 'Description' filter. The 'Manufacturer' filter is the same. The 'Model' filter is empty. The main table shows the same motorcycles as before, but only the Suzuki GSXS1000Z and Ducati Panigale V4 are listed, as they are the only ones that contain both 'new' and 'performance' in their descriptions. The words 'new' and 'performance' are highlighted in yellow in the descriptions of these two models.

Manufacturer:	Description:	Model:	Year:	Colour:
Suzuki	Born on the racetrack and raised on the street, the MY19 GSX-S1000 is derived from the legendary, championship-winning GSX-R1000. The <b>new</b> GSX-S lineup carries the spirit of the Suzuki GSX-R to the street, with shared technology and <b>performance</b> packaged into a chassis designed specifically for street riding comfort.	GSXS1000Z	2018	Black
Ducati	It is called Panigale V4 and it marks a <b>new</b> and important chapter in Ducati's history, a 'symphony' of <b>performance</b> and emotions that's 100% Italian. Panigale V4 is the first mass-produced Ducati motorcycle to be equipped with a 4-cylinder engine, closely derived from the Desmosedici of the MotoGP.	Panigale V4	2019	Red

A1-description attribute2.jpg

2. Each categorical filter supports selection of multiple attribute values, for example, colour = {red or blue}.

See normal requirement 6 and the screenshots: 6-multiple attributes.jpg 1, 2 & 3 to see the use of ORing of multiple attributes of the same type.

3. The web application is parameterised. This means there will be no reference to your attribute names or values in your HTML or JavaScript the only reference to them will be in your item collection file or files.

The entire webpage runs off of the data that is stored in `assets/file-server.csv`. The first two lines of the csv file pertain to the `keyTypes` array. The `keyTypes` array for the csv file that is supplied looks like this:

```
>> sessionGet(env.STORAGE_KEY_TYPES_KEY);  
← (5) [-]  
  ▶ 0: Object { key: "Manufacturer", type: "string" }  
  ▶ 1: Object { key: "Description", type: "Description" }  
  ▶ 2: Object { key: "Model", type: "String" }  
  ▶ 3: Object { key: "Year", type: "Number" }  
  ▶ 4: Object { key: "Colour", type: "String" }  
    length: 5  
  ▶ <prototype>: Array []
```

This `keyTypes` array is first used in the creation of `VariableItems` array. Each key in `keyTypes` is a property in a `VariableItem`. At every stage of the webpage, the `keyTypes` array is used to determine what to do with a particular property, filter, etc. It's also used to retrieve elements by their ids since their ids are named using `keyTypes`.

So long as there is still space on the webpage, you can have any number of `keyTypes`, hence any number of filters or of any combination filters.

Also, the order of the columns in the csv file is exactly the order that appears on the sidebar and the table columns.