CIS 371 Web Application Programming

VueJS 3.x (Vue3) II

Declarative Component-Based UI Framework

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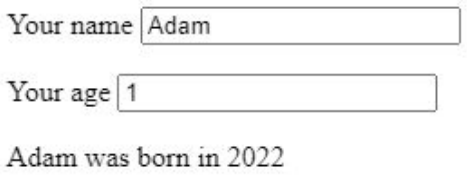
Based on the original version by Professor Hans Dulimarta.

Two-Way Data Binding (v-model)

Two-Way Data Binding (v-model)

src/Sample.vue

```
<template>
  <div>
    <p>Your name <input type="text" v-model="name" /></p>
    <p>Your name <input type="text" v-model.lazy="name" /></p>
    <p>Your age <input type="number" v-model.number="age" /></p>
    <p>{{ name }} was born in {{ thisYear - age }}</p>
  </div>
</template>
<script setup lang="ts">
import { ref } from "vue";
const name = ref("Adam");
const thisYear = new Date().getFullYear();
const age: number = 13;
</script>
```

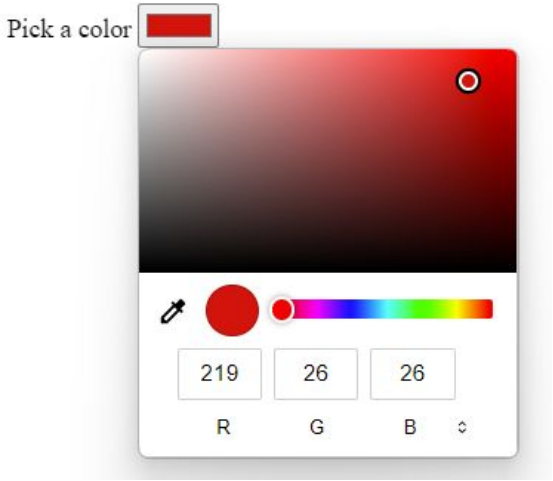


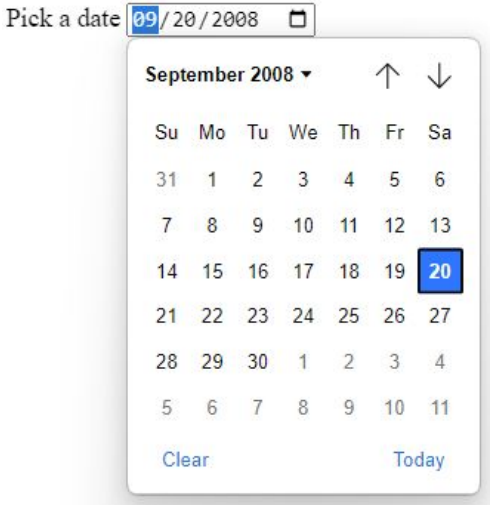
- *Input type email, password, color, date is handled similarly to type=”text”*
- *Input type=”range” (a horizontal slider) is handled similarly to type=”number”*
- *Lazy: bind the value after input lost keyboard focus*

Demo

Color and Date

```
<p>Pick a date <input type="date" v-model="dateStr" /></p>
```



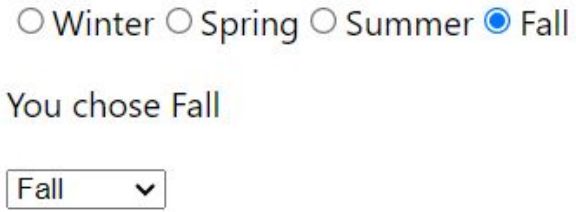



```
<p>Pick a color <input type="color" v-model="hexColorStr" /></p>
```

Demo

Radio buttons & Dropdown List

```
<template>
  <div>
    <input type="radio" id="t0" value="Winter" v-model="season" />
    <label for="t0">Winter</label>
    <input type="radio" id="t1" value="Spring" v-model="season" />
    <label for="t1">Spring</label>
    <input type="radio" id="t2" value="Summer" v-model="season" />
    <label for="t2">Summer</label>
    <input type="radio" id="t3" value="Fall" v-model="season" />
    <label for="t3">Fall</label>
    <p>You chose {{ season }}</p>
    <select v-model="season">
      <option value="Winter">Winter</option>
      <option value="Spring">Spring</option>
      <option value="Summer">Summer</option>
      <option value="Fall">Fall</option>
    </select>
  </div>
</template>
<script setup lang="ts">
import { ref } from "vue";
const season = ref("Fall");
</script>
```



Dropdown menus are handled similar to a radio button

Demo

Radio buttons & data array

```
<template>
  <div>
    <input type="radio" id="t0" value="Winter" v-model="season" />
    <label for="t0">Winter</label>
    <input type="radio" id="t1" value="Spring" v-model="season" />
    <label for="t1">Spring</label>
    <input type="radio" id="t2" value="Summer" v-model="season" />
    <label for="t2">Summer</label>
    <input type="radio" id="t3" value="Fall" v-model="season" />
    <label for="t3">Fall</label>
    <p>You chose {{ season }}</p>
  </div>
</template>
<script setup lang="ts">
import { ref } from "vue";
const season = ref("Fall");
</script>
```

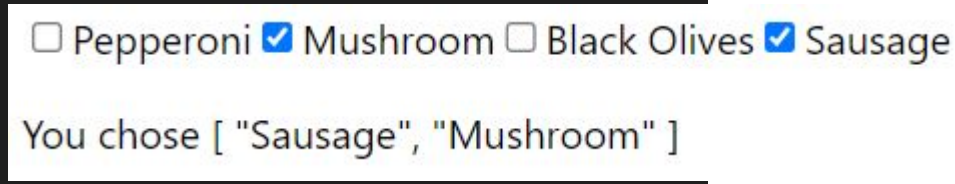
v-for and array source

```
<template>
  <div>
    <template v-for="(s, idx) in allSeasons" :key="idx">
      <input type="radio" :id="`r${idx}`" :value="s" v-model="season" />
      <label :for="`r${idx}`">{{ s }}</label>
    </template>
    <p>You chose {{ season }}</p>
  </div>
</template>
<script setup lang="ts">
import { ref } from "vue";
const allSeasons = ref(["Winter", "Spring", "Summer", "Fall"]);
const season = ref("Fall");
</script>
```

Demo

Checkbox

```
<template>
  <div>
    <input type="checkbox" id="c0" value="Pepperoni" v-model="toppings" />
    <label for="c0">Pepperoni</label>
    <input type="checkbox" id="c1" value="Mushroom" v-model="toppings" />
    <label for="c1">Mushroom</label>
    <input type="checkbox" id="c2" value="Black Olive" v-model="toppings" />
    <label for="c2">Black Olives</label>
    <input type="checkbox" id="c3" value="Sausage" v-model="toppings" />
    <label for="c3">Sausage</label>
    <p>You chose {{ toppings }}</p>
  </div>
</template>
<script setup lang="ts">
import { ref } from "vue";
const toppings = ref([]);
</script>
```



Demo

Checkbox & data array)

```vue
<template>
  <div>
    <input type="checkbox" id="c0" value="Pepperoni" v-model="toppings" />
    <label for="c0">Pepperoni</label>
    <input type="checkbox" id="c1" value="Mushroom" v-model="toppings" />
    <label for="c1">Mushroom</label>
    <input type="checkbox" id="c2" value="Black Olive" v-model="toppings" />
    <label for="c2">Black Olives</label>
    <input type="checkbox" id="c3" value="Sausage" v-model="toppings" />
    <label for="c3">Sausage</label>
    <p>You chose {{ toppings }}</p>
  </div>
</template>
<script setup lang="ts">
import { ref } from "vue";
const toppings = ref([]);
</script>
```

v-for and array source

```vue
<template>
  <div>
    <template v-for="(t, idx) in allToppings" :key="idx">
      <input type="checkbox" :id="`c${idx}`" :value="t" v-model="toppings" />
      <label :for="`c${idx}`">{{ t }}</label>
    </template>
    <p>You chose {{ toppings }}</p>
  </div>
</template>
<script setup lang="ts">
import { ref } from "vue";
const allToppings = ref(["Pepperoni", "Mushroom", "Black Olive", "Sausage"]);
const toppings = ref([]);
</script>
```

Demo

Two-way Data Binding (v-model)

- textbox
- colorpicker
- datepicker
- radio button list
- checkbox list

Demo

```
<script setup lang="ts">
import { ref } from "vue";
const name = ref("Adam");
const age = ref(21);
const hexColorStr = ref("#000");
const dateStr = ref("2018-10-12");
const season = ref("Fall");
const toppings = ref([]);
</script>
```

```
<template>
  <div>
    <p>Your name <input type="text" v-model="name" /></p>
    <p>Pick a date <input type="date" v-model="dateStr" /></p>
    <p>{{ name }} was born in {{ dateStr }}</p>
    <p>
      Pick a number
      <input type="range" v-model.number="age" min="1" max="100" step="2" />
    </p>
    <p>Your age <input type="number" v-model.number="age" /></p>
    <p>Pick a color <input type="color" v-model="hexColorStr" /></p>
    <p>Color <input type="text" v-model.lazy="hexColorStr" /></p>
    <input type="radio" id="t0" value="0" v-model="season" />
    <label for="t0">Winter</label>
    <input type="radio" id="t1" value="1" v-model="season" />
    <label for="t1">Spring</label>
    <input type="radio" id="t2" value="2" v-model="season" />
    <label for="t2">Summer</label>
    <input type="radio" id="t3" value="3" v-model="season" />
    <label for="t3">Fall</label>
    <p>You chose {{ season }}</p>
    <input type="checkbox" id="c0" value="0" v-model="toppings" />
    <label for="c0">Pepperoni</label>
    <input type="checkbox" id="c1" value="1" v-model="toppings" />
    <label for="c1">Mushroom</label>
    <input type="checkbox" id="c2" value="2" v-model="toppings" />
    <label for="c2">Black Olives</label>
    <input type="checkbox" id="c3" value="3" v-model="toppings" />
    <label for="c3">Sausage</label>
    <p>You chose {{ toppings }}</p>
  </div>
</template>
```

Event Handling

Event Handling Directives

<someHTMLTag **v-on:**domEvents=”yourEventHandlingFunction” ...>

<someHTMLTag **@**domEvents=”yourEventHandlingFunction” ...>

```
<div @mouseenter="yourFunctionHere">_____</div>
<img src="bird.png" @click="yourFunctionHere" @wheel="yourOtherFunction">
```

Tons of Event Names

Function Argument Type	Event Names
KeyboardEvent	`keypress, keydown, keyup, key`
`WheelEvent`	`wheel`
`MouseEvent`	`click`
`FocusEvent`	`blur, focus`
`MouseEvent`	`mousedown, mouseenter, mousemove, mouseup`

More Event names

Mouse/Keyboard Events: Filters/Modifiers

```
<template>
  <div>
    <input type="text"
    @keydown.right="showNextPage"
    @keydown.left.alt="showFirstPage" />
    <button @click.shift="goFirst">Start Over</button>
  </div>
</template>

<script setup lang="ts">
function showNextPage() {
  alert('Showing next page');
}

function showFirstPage() {
  alert('Showing first page');
}

function goFirst() {
  alert('Going to the first page');
}
</script>
```

*when **right-arrow** key is pressed*

*when both the **alt** key and the **left-arrow** key are pressed*

*when the **shift** key is held down during the **click***

Filters:

- .enter
- .tab
- .delete
- .esc
- .space
- .up
- .down
- .left
- .right

Modifiers:

- .alt
- .ctrl
- .meta
- .shift

Demo

Event Handling

- Handle Button Click
- Multiple Event Handlers on One Element

[More Event names]

[Demo]

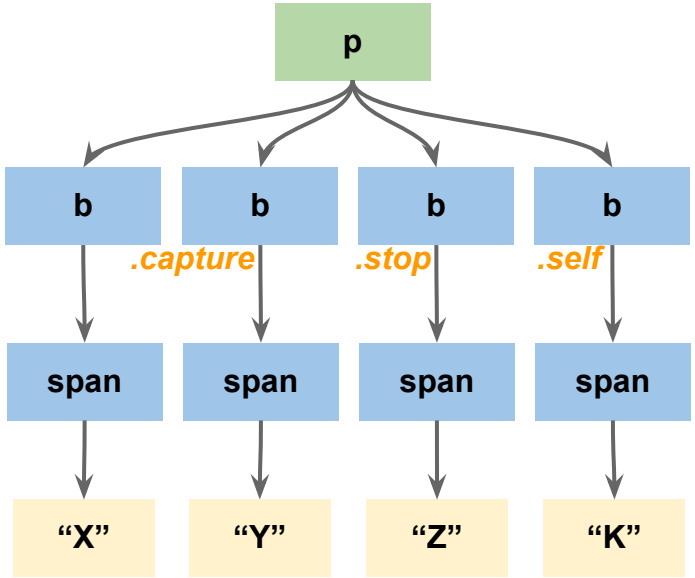
```
<template>
  <h1>Event Handling: Button Click and Mouse Activity</h1>
  <p>Counter is {{ count }}</p>
  <button @click="addOne">More</button>
  <button @click="subtractOne">Less</button>

  <p v-if="!mouseInside">Move mouse into the box</p>
  <p v-else>Move your mouse wheel</p>
  <div
    id="box"
    @wheel="wheelMoved"
    @mouseenter="mouseIn"
    @mouseleave="mouseOut"
  >
    {{ wheelCount }}
  </div>
</template>
```

```
<script setup lang="ts">
import { ref } from "vue";

const count = ref(0);

const wheelCount = ref(0);
const mouseInside = ref(false);

function wheelMoved(ev: WheelEvent) {
  count.value += Math.sign(ev.deltaY);
}

function mouseIn() {
  mouseInside.value = true;
}
function mouseOut() {
  mouseInside.value = false;
}
function addOne() {
  count.value++;
}
function subtractOne() {
  count.value--;
}
</script>
```

Mouse/Keyboard Event Filters/Modifiers

Event Modifier	Description
.prevent	Prevent browser default action of the event
.stop	Stop propagating event up (bubbling) to ancestor
.capture	Begin here, and propagate event down (capturing) to descendants
.self	Handle events only from self (neither from ancestors nor from descendants)

[More Modifiers]



- *Events originating in “X” are handled by span > b > p*
- *Events originating in “Y” are handled by b > span > p*
- *Events originating in “Z” are handled by span > b*
- *Events originating in “K” are handled by span > p*

[Demo]

Passing Arguments to Event Handler

```vue
<template>
  <ul>
    <li v-for="(p, index) in planets" :key="p.name">
      {{ p.name }}
      <button @click="deletePlanet(index)">Delete</button>
      <button @click="show(p.name)">View</button>
      <button @click="showDetails">Details</button>
    </li>
  </ul>
</template>
```

Demo

```vue
<script setup lang="ts">
import { ref } from 'vue';

const planets = ref([
  { name: "Mercury", revolution: 87.97 },
  { name: "Earth", revolution: 365.26 },
  { name: "Mars", revolution: 686.68 },
]);

function deletePlanet(index: number) {
  planets.value.splice(index, 1);
}

function show(name: string) {
  alert(`Showing ${name}`);
}

function showDetails(event: MouseEvent) {
  alert(`Showing details of ${event.target}`);
}
</script>
```

Template Refs

```vue
<template>
  <div>
    <h1 ref="bar"></h1>
    <button @click="incrementH1Counter">Plus 1</button>
  </div>
</template>

<script setup lang="ts">
import { ref, onMounted } from 'vue';
const bar = ref(null);
function incrementH1Counter() {
  bar.value.textContent++;

}

onMounted(() => {
  bar.value.textContent = "3";
});
</script>
```

Online doc

Demo 1

Demo 2

Exercise

Two-Way Data Binding (v-model)