6.2 Alapvető adatszerkezetek

Verem, Sor, Prioritási sor, Kupac

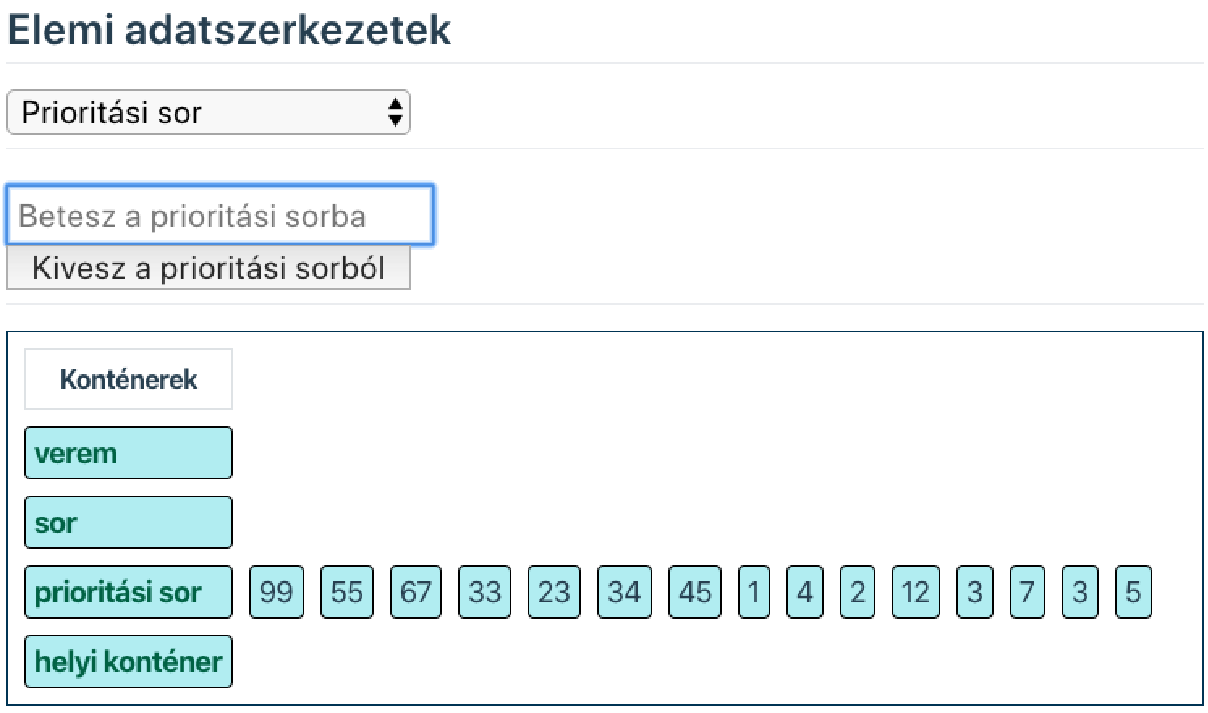
```
<template>
    <div id="conta">
        <select v-model="type">
            <option value="1">Verem</option>
            <option value="2">Sor</option>
            <option value="3">Prioritási sor</option>
        </select>
        <hr>
        <h3></h3>
        <input  v-model="elem"
                v-if="type==1"
                @keyup.enter="verem.put(elem),elem=''"
                placeholder="Betesz a verembe" />
        <input  v-model="elem"
                v-if="type==2"
                @keyup.enter="sor.put(elem),elem=''"
                placeholder="Betesz a sorba" />
        <input  v-model="elem"
                v-if="type==3"
                @keyup.enter="prisor.put(elem),elem='',rajz()"
                placeholder="Betesz a prioritási sorba" />
        <br>
        <button v-if="type==1 && verem.size"
                @click="kivett.push(verem.get())"
                >Kivesz a veremből</button>
        <button v-if="type==2  && sor.size"
                @click="kivett.push(sor.get())"
                >Kivesz a sorból</button>
        <button v-if="type==3  && prisor.size"
                @click="kivett.push(prisor.get()),rajz()"
                >Kivesz a prioritási sorból</button>
        <hr>
        <table class="s">
            <tr><th>Konténerek</th></tr>
            <tr v-for="(container,i) in [
                verem.container,
                sor.container,
                prisor.container,
                kivett
            ]">
                <td><b>{{ aszlist[i] }}</b></td>
                <td v-for="elem in container"
                    class="sor">{{ elem }}</td>
            </tr>
        </table>
        <span v-if="prisor.container.length>1 &&
                    prisor.container.length<100">
            <br>
            <div><b>Kupac ábrázolása:</b></div>
            <br>
            <div id="mynetwork"></div>
        </span>
        <hr>
        <a href="Adatszerk_forras.html">Forráskód</a>
    </div>
</template>

<script>
import vis from 'vis'
var nodes=[], edges=[], container, data, options, network
function drawgraph(p1, p2) {
  nodes = new vis.DataSet(p1)
  edges = new vis.DataSet(p2)
  container = document.getElementById('mynetwork')
  data = { nodes, edges }
  options = {
    layout: {
        hierarchical: {
            sortMethod: "directed"
        }
    },
    nodes: {
      shape: 'box',
      fixed: true,
      font: {
        color: '#000',
        size: 36, // px
        face: 'Niramit',
        background: 'none',
        strokeWidth: 0, // px
        strokeColor: '#ffffff',
        align: 'center',
        multi: false,
        vadjust: 0
      },
      color: {
        border: '#333333',
        background: 'rgb(190, 237, 242)',
        highlight: {
          border: '#2B7CE9',
          background: '#42B5BF'
        }
      }
    },
    edges: {
      arrows: {
        to: {enabled: true, scaleFactor:  0.8, type:'arrow'}
      },
      arrowStrikethrough: false,
      chosen: true,
      color: {
        color:'#444444',
        highlight:'#ed4576',
        hover: '#848484',
        inherit: 'from',
        opacity: 1
      },
      dashes: false
    }
  }
  network = new vis.Network(container, data, options)
}
class Stack {
    constructor() {
        this.container = [], this.size = 0
    }
    put(x) {
        if (Array.isArray(x)) {
            x.forEach(element => {
                this.container.push(element),
                this.size++
            })
        } else {
            this.container.push(x), this.size++
        } //O(1)
    }
    get() { // O( 1 )
        if (this.size) {
            this.size--
            return this.container.pop() // O( 1 )
        } else return null
    }
    check() {
        return this.container[0] // O( 1 )
    }
    toarray() { // O( n * get() )
            let rv = []
            while (this.size)
                rv.push(this.get())
            return rv
        }
        [Symbol.iterator]() { // O( n * get() )
            return {
                next: () => {
                    if (this.size > 0) {
                        return {
                            value: this.get(),
                            done: false
                        }
                    } else {
                        return {
                            done: true
                        }
                    }
                }
```

```
            }
        }
}
class BadQueue extends Stack {
    constructor() {
        super()
        this.offset = 0
    }
    get() { // O( n )
        if (this.size) {
            this.size--
            return this.container.shift() // O( n )
        } else return null
    }
}
class Queue extends Stack {
    constructor() {
        super()
        this.offset = 0
    }
    get() { // O( 1 )
        if (this.size) {
            this.size--
            let elem = this.container[this.offset++]
            if (this.offset * 2 >= this.container.length) {
                this.container = this.container.slice(this.offset)
                this.offset = 0
            }
            return elem // O( 1 )
        } else return false
    }
    check() {
        return this.container[this.offset] // O( 1 )
    }
}
class PQueue extends Stack {
    put(x) { // O(1) / element
        if (Number(x)==x) x=Number(x)
        if (Array.isArray(x)) {
            x.forEach(element => {
                this.container.push(element), this.fix(this.size++)
            })
        } else {
            this.container.push(x), this.fix(this.size++)
        }
    }
    get() { // O(log n)
        if (this.size) {
            let ret = this.container[0]
            if (--this.size) {
                this.container[0] = this.container.pop()
                this.fixup(0)
            } else this.container.pop()
            return ret
        } else return null
    }
    fixup(p) { // O(log n)
        let q1 = ( p + 1 ) * 2 ,
            q2 = q1 - 1,
            q = 0
        if (q1 > this.size + 2) q1 = p
        if (q2 > this.size + 2) q2 = q1
        this.container[q1] > this.container[q2] ? q = q1 : q = q2
        console.log(this.container[q1],this.container[q2],q)

        if (p != q) {
            this.cshn(q, p), this.fixup(q)
        }
    }
    fix(p) { // O(log n)
        let q = Math.round( (p+1) / 2 - 0.4 ) - 1
        this.cshn(p, q)
        if (q > 0) this.fix(q)
    }
    cshn(a, b) { // O(1)
        if ( this.container[a] > this.container[b] )
        [ this.container[a], this.container[b] ] =
        [ this.container[b], this.container[a] ]
    }
}
export default {
    data: () => ({
        aszlist: ['verem','sor','prioritási sor','helyi konténer'],
        type: 3,
        elem: '',
        kivett: [],
        verem: new Stack,
        sor: new BadQueue,
        prisor: new PQueue,
        nodes, edges
    }),
    methods: {
        rajz() {
            nodes=[];
            edges=[];
            this.prisor.container.forEach( (v,i) => {
                nodes.push({ id: i+1, label: `${ v }` })
            } );
            this.kupac(1);
            if (nodes.length>2 && edges.length)
                drawgraph(nodes, edges );
            this.nodes=nodes;
            this.edges=edges;
        },
        kupac(i) {
            if (2*i<=nodes.length) {
                edges.push( { from: i, to: 2*i } );
                this.kupac(2*i)
            };
            if (2*i<nodes.length) {
                edges.push( { from: i, to: 2*i+1 } );
                this.kupac(2*i+1)
            };
        }
    }
}
</script>

<style lang="scss" scoped>
div#conta {
    input {
        font-size: 20px;
        padding: 5px;
        width: 250px;
    }
    select {
        font-size: 20px;
        width: 250px;
    }
    button {
        font-size: 20px;
        width: 250px;
    }
    table.s {
        border-collapse: separate;
        border-spacing: 10px;
        border:solid 1px #123456;
        td {
            background-color: rgb(190, 237, 242);
            border: solid 1px black;
            border-radius: 4px;
            font-size: 18px;
            padding: 5px;
        }
    }
    div#mynetwork {
        height:500px;
        border: solid 1px black;
        border-radius:10px;
        box-shadow: 0 0 4px black;
    }
}
</style>
```



Elemi adatszerkezetek

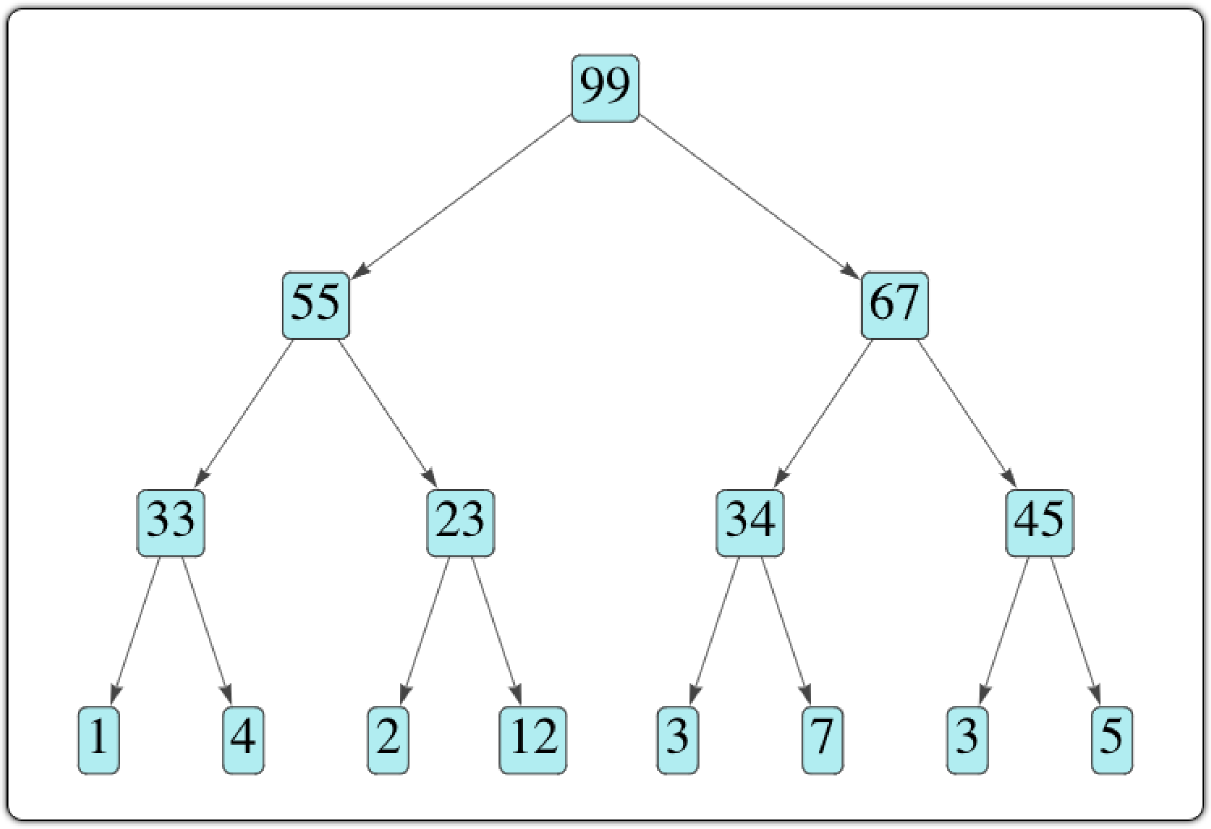
Prioritási sor

Betesz a prioritási sorba

Kivesz a prioritási sorból

Konténerek															
verem															
sor															
prioritási sor	99	55	67	33	23	34	45	1	4	2	12	3	7	3	5
helyi konténer															

Kupac ábrázolása:



6.3 Rekurzióval megoldható problémák

Hanoi Tororny példaprogram - VUE

A megoldás matematikai modellje

$h(n, a, b) =$

- ha $n = 1$, akkor: $\quad a \rightarrow b,$
- egyébként: $h(n-1, a, 6-a-b), \quad a \rightarrow b, \quad h(n-1, 6-a-b, b)$

A problémát megoldó JS függvény

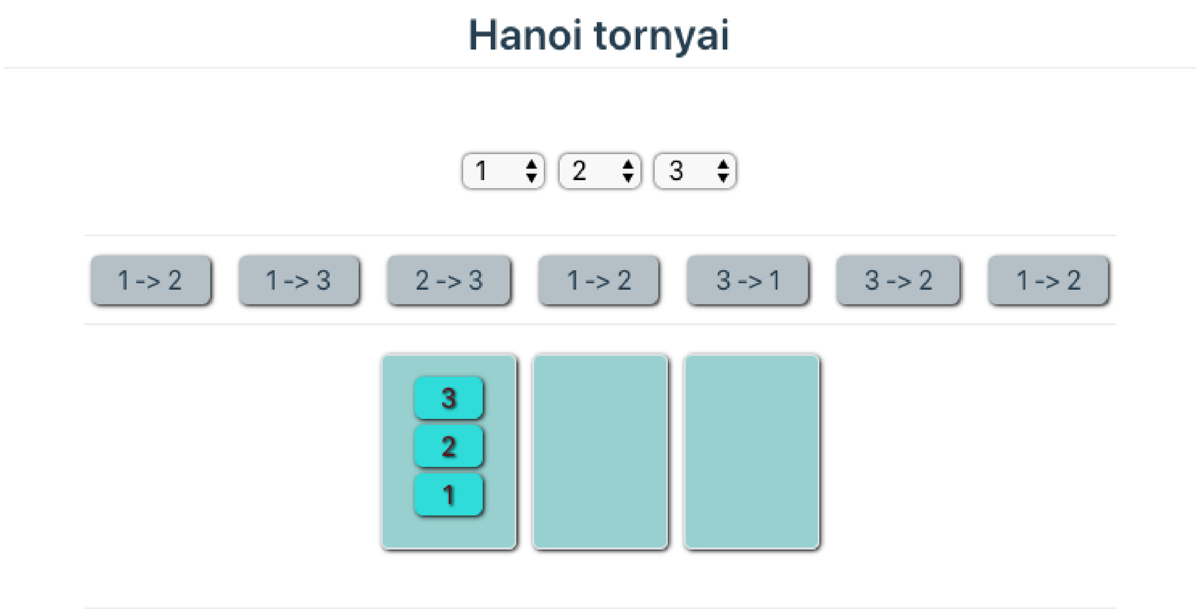
```js
const h = ( a, b, n ) => (
    n < 2
        ? `${ a } -> ${ b }`
        : `${ h( a, 6-a-b, n-1 ) },
           ${ a } -> ${ b },
           ${ h( 6-a-b, b, n-1 ) }`
);
```

```
<template>
    <div class="main" name=hanoi>
        <div class=i>
            <select v-model.number="a" @change="hanoi()">
                <option v-for="i in 3">{{i}}</option>
            </select>
            <select v-model.number="b" @change="hanoi()">
                <option v-for="i in 3">{{i}}</option>
            </select>
            <select v-model.number="n" @change="hanoi()">
                <option v-for="i in 13">{{i}}</option>
            </select>
        </div>
        <br>
        <hr>
        <div class="co"
             :id="windowWidth>600
                    ?'so'
                    :(windowWidth>300?'ko':'mo')">
                <div v-if="elem!='! ! ! ! !'"
                     :id="i" @click="rak(elem,i)"
                     :key=i v-for="(elem,i) in mo.split(',')"
                     >{{ elem }}</div>
        </div>
        <hr>
        <div class=i>
            <table>
                <td v-for="oszlop in t"
```

```
                    :style="`height: ${n*30+10}px;`">
                    <div v-for="korong in oszlop"
                    >{{korong}}</div>
                </td>
            </table>
        </div>
        <br>
        <hr>
        <a href="/~tnemeth/examples/algoexamples/Hanoi_forras.html"
           >Forráskód</a>
    </div>
</template>
<script>
import { vueWindowSizeMixin } from 'vue-window-size'
const h = ( a, b, n ) => (
    n < 2
        ? `${ a } -> ${ b }`
        : `${ h( a, 6-a-b, n-1 ) },
           ${ a } -> ${ b },
           ${ h( 6-a-b, b, n-1 ) }`
)
export default {
    name: 'hanoi',
    mixins: [vueWindowSizeMixin],
    data: () => ({
        a:1, b:2, n:3, mo: '',
        t: [[],[],[]]
    }),
    methods: {
        rak(x,i) {
            let jt=this.mo.split(',')
            jt[i]="! ! ! ! !"
            this.mo=jt.join(',')
            var [i,j]=x.split(' -> ')
            var le = this.t[i-1].pop()
            if ( le!==undefined ) this.t[j-1].push( le )
            this.$forceUpdate()
        },
        hanoi() {
            if (this.a==this.b) {
                this.a=1
                this.b=2
            }
            this.t[this.a-1]=Array(this.n)
                                .fill(0)
                                .map((v,i) => this.n-i)
            this.t[this.b-1]=[]
            this.t[6-this.a-this.b-1]=[]
            this.mo = this.n<14?h(this.a, this.b, this.n):'túl nagy az n'
        }
    },
    mounted() {
       this.hanoi()
    }
```

```
}
</script>

<style lang=scss scoped>
    div.main {
        text-align: center;
        div.i {
            text-align: center;
        }
        margin: 50px;
        select {
            width: 50px;
            font-size: 16px;
            margin: 3px;
            border-radius: 9px;
            border: none;
            box-shadow: 0px 0px 3px black;
        }
        div.co {
            text-align: center;
            display: grid;
            grid-column-gap: 10px;
            grid-row-gap: 10px;
            div {
                white-space: nowrap;
                background-color: rgb(182, 191, 199);
                padding: 6px;
                margin: 4px;
                cursor:pointer;
                user-select: none;
                box-shadow: 1px 1px 3px black;
                border-radius: 5px;
            }
        }
        div#so {
            grid-template-columns: repeat(7,auto);
        }
        div#ko {
            grid-template-columns: repeat(3,auto);
        }
        div#mo {
            grid-template-columns: repeat(2,auto);
        }
        table {
            text-align: center;
            border-collapse: separate;
            margin: 0 auto;
            display: table;
            border-spacing: 10px;
        }
        td {
            width: 50px;
            text-align:center ;
            vertical-align: top;
            box-shadow: 1px 1px 3px black;
            border-radius: 5px;
            background-color: rgb(164, 208, 207);
            div {
                box-shadow: 1px 1px 3px black;
                border-radius: 5px;
                padding :4px;
                margin: 4px;
                background-color: rgba(111, 220, 218, 90);
                color: rgb(77, 19, 23);
                text-shadow: 1px 1px 2px black;
            }
        }
    }
</style>
```



Példa rekurzió alkalmazására - Aknakereső játék - VUE

```
<template>
  <div id="app">
    <table class="t1" @click.right.stop.prevent>
      <tr v-for = "(row,y) in table">
        <td v-for = "(cell,x) in row"
            @click.exact = "lclick(x,y)"
            @click.alt.exact = "rclick(x,y)"
            @click.ctrl.exact= "rclick(x,y)"
            @click.right.stop.prevent= "rclick(x,y)"
            v-html="cell==='O'?'&#x1F4A3;':cell==='B'?'<big>&#9873;
</big>':cell"
            :class="'p'+cell"></td>
      </tr>
      <tr>
        <td colspan=10 class="blank"></td>
      </tr>
      <tr v-if="!nyert">
        <td colspan=2 class="text">Mód:</td>
        <td class="pB" v-if="!bmode" @click="bmode=true">&#9873;</td>
        <td v-if="bmode" @click="bmode=false"> </td>
        <td colspan="7" class="text">
          <span v-if="!bmode"
                @click="bmode=true"
                > &#8678; vedd fel a bombajelölőt! </span>
          <span v-else
                @click="bmode=false"
                > &#8678; tedd le a bombajelölőt! &#8679; </span>
        </td>
      </tr>
    </table>
    <span v-if="nyert===1">
      <br>
      <div class="nyert">Nyertél!</div>
    </span>
    <span v-if="nyert===-1">
      <br>
      <div class="vesztett">Vesztettél!</div>
    </span>
    <div class="btc">
      <br>
      <div v-if="nyert"
          @click="createtable()"
          class="btn">Új játszma</div>
    </div>
    <hr>
    <a href="/~tnemeth/examples/webexamples/Aknakereso_forras.html">
        Forráskód
    </a>
  </div>
</template>

<script>
let masz, tilt, xp, yp, hba
export default {
  name: 'aknak',
  data() {
    return {
      n:10, m:10, asz: 14, nyert: 0, bmode: false,
      table: [],
      aknak: 0
    }
  },
  mounted() {
    this.createtable()
  },
  methods: {
    createtable() {
      hba = new Set()
      this.aknak = new Set()
```

```
        this.nyert=0
        masz=0
        tilt=0
        let x, y
        this.table=[]
        for (let i=0;i<this.n;i++) {
            let sor = []
            for (let j=0;j<this.m;j++) sor.push(' ')
            this.table.push(sor)
        }
        for (let i=0;i<this.asz;i++) {
            do {
              x = Math.trunc(Math.random()*this.n)
              y = Math.trunc(Math.random()*this.m)
            } while ( this.aknak.has(`${y}-${x}`) )
            this.aknak.add(`${y}-${x}`)
        }
      },
      lclick(x,y) {
        if (this.bmode) {
          this.rclick(x,y)
          this.bmode=false
        }
        else if ( !this.nyert && this.table[y][x]==="B" ) {
            this.rclick(x,y)
        }
        else if ( !this.nyert && this.table[y][x]===" " ) {
          if (this.aknak.has(`${x}-${y}`) ) {
            this.nyert=-1
            Array.from(this.aknak).forEach( v => {
                [xp, yp]=v.split('-')
                if (this.table[yp][xp]===" ") this.$set(this.table[yp], xp,
'O')
            })
            Array.from(hba).forEach( v => {
                [xp, yp]=v.split('-')
                this.$set(this.table[yp], xp, 'H')
            })
            this.$set(this.table[y], x, 'O')
            this.aknak.clear()
            return false
          }
          let vsz=[-1,0,1], fl=vsz, count=0
          vsz.forEach( v =>
            fl.forEach( f => {
              if (this.aknak.has(`${x+v}-${y+f}`)) count++
            } )
          )
          this.$set(this.table[y], x, count)
          if (count==0) {
            vsz.forEach( v =>
              fl.forEach( f => {
                if (
                    typeof this.table[y+f] !== 'undefined' &&
                    this.table[y+f][x+v]===" "
                ) this.lclick(x+v,y+f)
              } )
            )
          }
        }
      },
      rclick(x,y) {
        if ( !this.nyert && this.table[y][x]===" " ) {
          this.$set(this.table[y], x, "B")
          if ( this.aknak.has(`${x}-${y}`) ) masz++
          else tilt++, hba.add(`${x}-${y}`)
          if ( masz === this.asz && tilt===0 ) this.nyert=1
        }
        else if ( !this.nyert && this.table[y][x]==="B" ) {
          if ( this.aknak.has(`${x}-${y}`) ) masz--
          else tilt--, hba.delete(`${x}-${y}`)
          this.$set(this.table[y], x, " ")
          masz--
        }
      }
    }
  }
  </script>

  <style lang=scss scoped>
  @import url('https://fonts.googleapis.com/css?
  family=Roboto+Slab&display=swap');
  .btc {
    text-align: center;
  }
  .btn {
    margin: 0 auto;
    padding: 6px;
    cursor:pointer;
    background-color: #3a435c;
    color:snow;
    width:90px;
    border-radius: 7px;
    box-shadow: 0 0 5px black ;
  }
  .btn:hover {
    cursor:pointer;
    background-color: #273048;
    color:snow;
      box-shadow: 0 0 2px black ;
  }
  .cx {
    margin-left:10px;
    margin-right: 20px;
  }
  #app {
      font-family: 'Roboto Slab', serif;
      user-select: none;
```

```
        text-align: center;
        color: #095d6c;
        h2 {
            text-shadow: 0px 0px 2px #19334d;
        }
        div#content {
            text-align: center;
        }
    }
    div.ujj {
        margin:0px auto;
        width: 90px;
        cursor:pointer;
        border-radius: 4px;
        box-shadow: 1px 1px 3px rgb(99, 97, 97);
    }
    div.ujj:hover {
        background-color: #cfded9;
        box-shadow: 1px 1px 3px rgb(34, 33, 33);
    }
    div.nyert {
      font-size: 25px;
      color:rgb(58, 147, 157) ;
      font-weight: bold;
      text-shadow: 0 0 2px rgb(138, 29, 29);
    }
    div.vesztett {
      font-size: 25px;
      color:rgb(213, 37, 34) ;
      font-weight: bold;
      text-shadow: 0 0 2px rgb(138, 29, 29);
    }
    table {
        border-collapse: inherit;
        display: table;
        margin:0px auto;
        border-spacing: 1px;
        td {
            text-align: center;
            width: 28px;
            height: 28px;
            background-color: #e6f3ef;
            border-radius: 4px;
            box-shadow: 1px 1px 3px rgb(99, 97, 97);
            cursor: pointer;
            border: solid 1px rgb(29, 43, 75);
            color:rgb(55, 6, 6);
            padding:3px;
        }
        td.p0 { background-color: #afe9d8; }
        td.p1 { background-color: #e6e9af; }
        td.p2 { background-color: #f5d4a3; }
        td.p3 { background-color: #ff9f9f; }
        td.p4 { background-color: #fa8383; }
        td.p5 { background-color: #f94343; color:white;}
        td.pB {
            background-color: #ffc3f6;
            color:rgb(205, 73, 73);
            font-weight: bold;
            text-shadow: 0 0 2px rgb(0, 60, 255);
        }
        td.pH {
            background-color: #9f0707;
            color:snow;
            font-weight: bold;
        }
        td.pO {
            background-color: #a7a7a7;
            color:rgb(240, 203, 203);
            font-weight: bold;
        }
        td.text {
            background-color: #cecece;
            color:rgb(19, 90, 106);
            font-weight: bold;
        }
        td.blank {
          border:none;
          background: none;
          box-shadow: none;
          height: 10px;
          cursor: none;
        }
    }

    </style>
```

6.4 Dinamikus programozás

Tükörszó probléma megoldása rekurzió - memorizálással

A megoldás matematikai modellje

$f(i, j) =$

- ha $i >= j$, akkor: 0
- egyébként
  - ha $s[i] = s[j]$, akkor $f(i+1, j-1)$
  - egyébként: $min(f(i+1, j), f(i, j-1)) + 1$

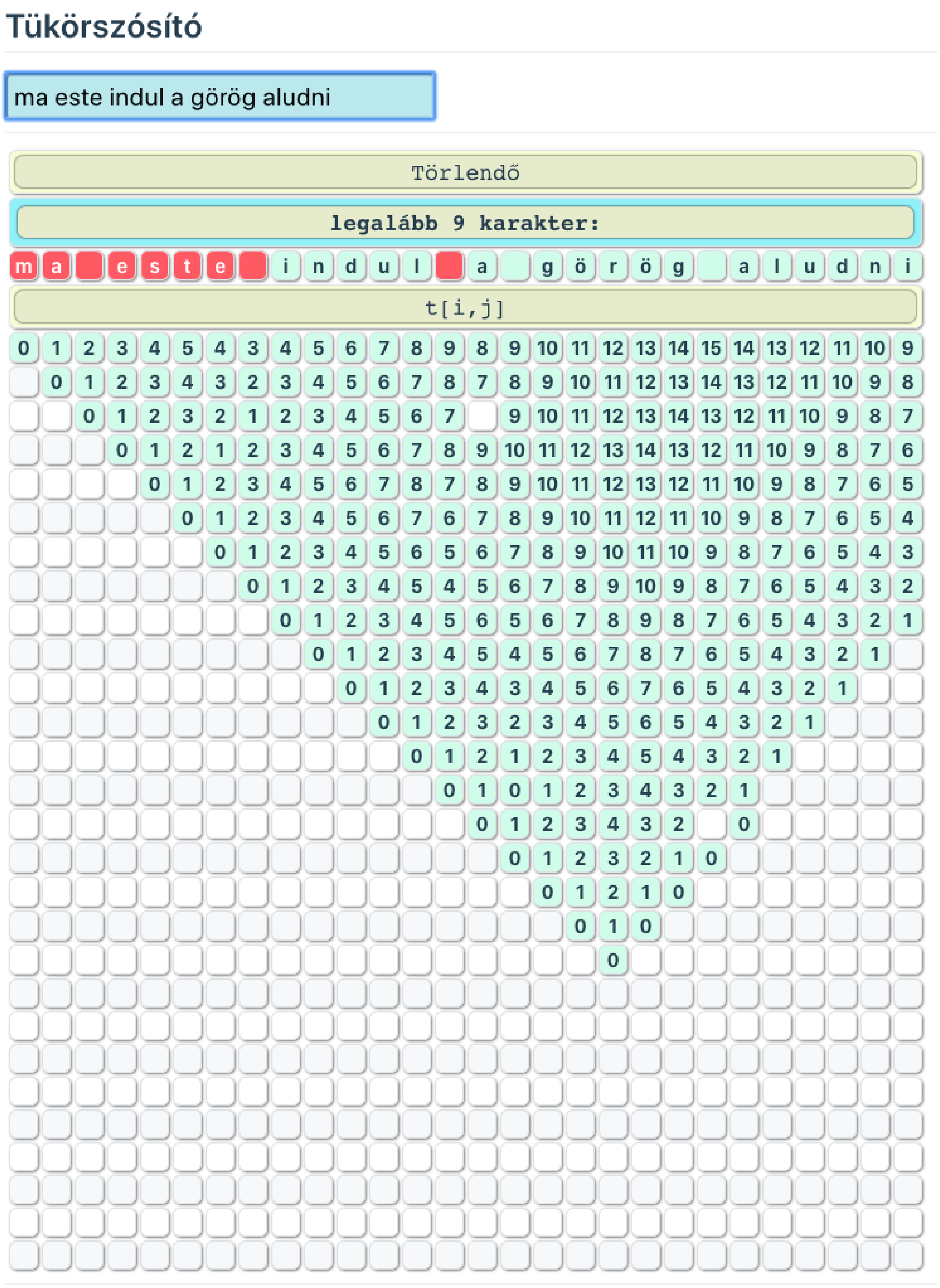
Megoldás rekurzió-memorizálás módszerével

```js
let o = {
    mi(i=0,j=this.s.length-1) {
      !this.t   ? this.t = Array(this.s.length)
                           .fill()
                           .map(v=>Array(this.s.length)
                           .fill(0))
                : null
      return this.t[i][j] ? this.t[i][j] : i>=j ? this.t[i][j] = 1 :
             this.s[i]===this.s[j] ? this.t[i][j] = this.mi(i+1,j-1) :
             this.t[i][j] = Math.min(this.mi(i+1,j),this.mi(i,j-1))+1
    },
    mo(i=0,j=this.s.length-1) {
      let s=this.s.split('')
      do this.t[i][j-1]+1===this.t[i][j] ? s[j--]='.' :
         this.t[i+1][j]+1===this.t[i][j] ? s[i++]='.' : ( i++, j-- )
      while (this.t[i][j]-1)
      return s.join('')
    }
}
o.s = 'pelda'
console.log(`
    ${ o.x = o.mi()-1 } karakter törlésével a tükörszó:
    ${ o.x?o.mo():o.s }
`)
```

```
<template>
    <div id=cont>
        <div id=app>
        <input v-model="s"
               @keyup="szamol()"
               placeholder="Szó / Szöveg"/>
        <hr>
        <table v-if="mi">
            <tr><td class="szoveg"
                    :colspan="s.length"
                    title="A törlendő karakterek piros mezőben, az
előállított tükörszó zöldben."
                    ><pre>Törlendő</pre></td></tr>
            <tr>
                <td class="eredm" :colspan="s.length">
                    <pre>legalább {{ mi }} karakter:</pre>
                </td>
            </tr>
            <tr>
                <td :class="el=='.'?'z':'x'"
                    v-html="el==='.'?s[i]:el"
                    v-for="(el,i) in mo"/>
            </tr>
            <tr>
                <td class="szoveg" :colspan="s.length">
                    <pre>t[i,j]</pre>
                </td>
            </tr>
            <tr v-for="(row,j) in t">
                <td :class="cell?'x':'o'"
                    :key="`${i}-${j}`"
                    v-for="(cell,i) in row">
                    {{ cell?cell-1:'' }}
                </td>
            </tr>
        </table>
        <div v-else>Ez tükörszó</div>
        </div>
        <hr>
        <a href="/~tnemeth/examples/algoexamples/Tukorszo_forras.html">
            A megoldás matematikai modelleje és forráskódja
        </a>
    </div>
</template>

<script>
let o = {
    mi(i=0,j=this.s.length-1) {
      return this.t[i][j] ? this.t[i][j] : i>=j ? this.t[i][j] = 1 :
             this.s[i]===this.s[j] ? this.t[i][j] = this.mi(i+1,j-1) :
             this.t[i][j] = Math.min(this.mi(i+1,j),this.mi(i,j-1))+1
    },
    mo(i=0,j=this.s.length-1) {
      let s=this.s.split('')
      do this.t[i][j-1]+1===this.t[i][j] ? s[j--]='.' :
         this.t[i+1][j]+1===this.t[i][j] ? s[i++]='.' : ( i++, j-- )
      while (this.t[i][j]-1)
      return s.join('')
    }
}
export default {
    name: 'tsz',
    data: () => ({
        s: "",
        mi: 0,
        mo: "",
        t: []
    }),
    methods: {
        szamol() {
            this.s=this.s.toLocaleLowerCase()
            if (this.s.length) {
                o.t = Array(this.s.length)
                        .fill()
                        .map(v=>Array(this.s.length).fill(0))
                o.s=this.s
                this.mi=o.mi()-1
                this.mo=this.mi?o.mo():o.s
                this.t=o.t
            }
        }
    }
}
</script>

<style lang="scss" scoped>
div#cont {
    div#app {
        font-size: 20px;
        input {
            background-color: rgb(196, 232, 238);
            width: 327px;
            font-size: 20px;
            padding: 5px;
            border-radius: 5px;
        }
    }
    table {
        padding: 0px;
        margin: 0px;
        border-collapse: separate;
        border-spacing: 3px;
        display: table;
        td {
            text-align: center;
            font-size: 15px;
            padding: 2px;
            width:  17px;
            height: 17px;
            box-shadow: 1px 1px 2px gray;
            border-radius: 6px;
        }
        td.z {
            background-color: rgb(235, 88, 98);
            font-weight: bold;
            color:snow;
        }
        td.x {
            background-color: rgb(217, 252, 233);
            font-weight: bold;
        }
        td.szoveg {
            user-select: none;
            cursor: default;
            text-align: center;
            background-color: rgb(251, 255, 212);
            font-size: 18px;
            width: 320px;
        }
        td.eredm {
            font-weight: bold;
            font-size: 18px;
            padding: 4px;
            background-color: rgb(169, 241, 249);
        }
    }
}
pre {
    margin: 2px ;
    padding: 0 ;
    background-color: rgb(231, 235, 202);
    box-shadow: 0 0 2px black;
}
</style>
```



Tükörszósító

ma este indul a görög aludni

Törlendő

legalább 9 karakter:

m	a		e	s	t	e		i	n	d	u	l		a		g	ö	r	ö	g		a	l	u	d	n	i

t[i,j]

0	1	2	3	4	5	4	3	4	5	6	7	8	9	8	9	10	11	12	13	14	15	14	13	12	11	10	9
	0	1	2	3	4	3	2	3	4	5	6	7	8	7	8	9	10	11	12	13	14	13	12	11	10	9	8
		0	1	2	3	2	1	2	3	4	5	6	7		9	10	11	12	13	14	13	12	11	10	9	8	7
			0	1	2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	13	12	11	10	9	8	7	6
				0	1	2	3	4	5	6	7	8	7	8	9	10	11	12	13	12	11	10	9	8	7	6	5
					0	1	2	3	4	5	6	7	6	7	8	9	10	11	12	11	10	9	8	7	6	5	4
						0	1	2	3	4	5	6	5	6	7	8	9	10	11	10	9	8	7	6	5	4	3
							0	1	2	3	4	5	4	5	6	7	8	9	10	9	8	7	6	5	4	3	2
								0	1	2	3	4	5	6	5	6	7	8	9	8	7	6	5	4	3	2	1
									0	1	2	3	4	5	4	5	6	7	8	7	6	5	4	3	2	1	
										0	1	2	3	4	3	4	5	6	7	6	5	4	3	2	1		
											0	1	2	3	2	3	4	5	6	5	4	3	2	1			
												0	1	2	1	2	3	4	5	4	3	2	1				
													0	1	0	1	2	3	4	3	2	1					
														0	1	2	3	4	3	2		0					
															0	1	2	3	2	1	0						
																0	1	2	1	0							
																	0	1	0								
																		0									