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//initialize calc screen strings
var calcInput = "";
var calcOutput = "";
//initialize calculating lists
var num = [0,1,2,3,4,5,6,7,8,9,"."];
var operators = ["+", "x", "-", "/", "^"];

//updates the calc screen whenever an input is received
function updateScreen() {
  setText("inputBox", calcInput);
  setText("outputBox", calcOutput);
}

//number buttons
onEvent("zeroButton", "click", function() {
  calcInput = calcInput + "0";
  updateScreen();
});

onEvent("oneButton", "click", function() {
  calcInput = calcInput + "1";
  updateScreen();
});

onEvent("twoButton", "click", function() {
  calcInput = calcInput + "2";
  updateScreen();
});

onEvent("threeButton", "click", function() {
  calcInput = calcInput + "3";
  updateScreen();
});

onEvent("fourButton", "click", function() {
  calcInput = calcInput + "4";
  updateScreen();
});

onEvent("fiveButton", "click", function() {
  calcInput = calcInput + "5";
  updateScreen();
});

onEvent("sixButton", "click", function() {
  calcInput = calcInput + "6";
  updateScreen();
});

onEvent("sevenButton", "click", function() {
  calcInput = calcInput + "7";
  updateScreen();
});

onEvent("eightButton", "click", function() {
  calcInput = calcInput + "8";
  updateScreen();
});

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onEvent("nineButton", "click", function( ) {
    calcInput = calcInput + "9";
    updateScreen();
});

onEvent("decimalButton", "click", function( ) {
    calcInput = calcInput + ".";
    updateScreen();
});

//operator buttons
onEvent("divideButton", "click", function( ) {
    calcInput = calcInput + "/";
    updateScreen();
});

onEvent("multiplyButton", "click", function( ) {
    calcInput = calcInput + "x";
    updateScreen();
});

onEvent("subtractButton", "click", function( ) {
    calcInput = calcInput + "-";
    updateScreen();
});

onEvent("addButton", "click", function( ) {
    calcInput = calcInput + "+";
    updateScreen();
});

onEvent("exponentButton", "click", function( ) {
    calcInput = calcInput + "^";
    updateScreen();
});

onEvent("equalButton", "click", function( ) {
    calcOutput = "=" + organize(calcInput);
    updateScreen();
    calcInput = "";
    calcOutput = "";
});

//miscellaneous buttons
onEvent("clearButton", "click", function( ) {
    calcInput = "";
    calcOutput = "";
    updateScreen();
});

onEvent("deleteButton", "click", function( ) {
    calcInput = calcInput.substring(0, calcInput.length - 1);
    updateScreen();
});

onEvent("negativeButton", "click", function( ) {
    calcInput = calcInput + "-";
    updateScreen();
});

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//organizes the inputted string into separate elements to calculate the answer to the expression
function organize(equation) {
    var ogEquation = equation;
    var eqnList = [];
    var index = 0;
    var ans;
    for (var a = 1; a <= equation.length+1; a++) {
        for (var b = 0; b < num.length; b++) {
            if (equation.substring(index,a).includes(num[b])) {
                if (!(equation.substring(a,a+1) == "0" || equation.substring(a,a+1) == "1" || equation.substring(a,a+1) == "2"
                || equation.substring(a,a+1) == "3" || equation.substring(a,a+1) == "4" || equation.substring(a,a+1) == "5"
                || equation.substring(a,a+1) == "6" || equation.substring(a,a+1) == "7" || equation.substring(a,a+1) == "8"
                || equation.substring(a,a+1) == "9" || equation.substring(a,a+1) == "." || equation.substring(a,a+1) == "-"))
                && equation.substring(index,a) != "") {
                    appendItem(eqnList,ogEquation.substring(index,a));
                    index = a;
                }
            } else if (equation.substring(index,a).includes(operators[b]) &&
            !equation.substring(a,a+1).includes(operators[b])) {
                appendItem(eqnList,ogEquation.substring(index,a));
                index = a;
            }
        }
    }
    //if there was only 1 number as an input,
    //the answer is set as that one number
    if (eqnList.length == 1) {
        ans = eqnList[0];
        return ans;
    }
    //converts numbers from strings to integers
    for (var c = 0; c < eqnList.length; c++) {
        var item = eqnList[c];
        var temp;
        for (var d = 0; d < num.length-1; d++) {
            //positive number strings
            if (item.substring(0,1) == (num[d])) {
                temp = item*1;
                removeItem(eqnList,c);
                insertItem(eqnList,c,temp);
            }
            //negative number strings
            } else if (item.substring(0,1) == "-") {
                temp = item.substring(1,item.length)*1;
                temp = 0 - temp;
                removeItem(eqnList,c);
                insertItem(eqnList,c,temp);
            }
        }
    }
    ans = calculate(eqnList,0,eqnList.length);
    if (ans == "Infinity") {
        ans = "Number too large";
    }
    return ans;
}

function calculate(equationList,startingIndex,endingIndex) {

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var calcAns;
for (var e = startingIndex; e < endingIndex; e++) {
  if (equationList[e] == "^") {
    calcAns = Math.pow(equationList[e-1],equationList[e+1]);
    for (var remE = 0; remE < 3; remE++) {
      removeItem(equationList,e-1);
    }
    insertItem(equationList,e-1,calcAns);
    e = 0;
  }
}
for (var md = startingIndex; md < endingIndex; md++) {
  if (equationList[md] == "x") {
    calcAns = (equationList[md-1])*(equationList[md+1]);
    for (var rem1Md = 0; rem1Md < 3; rem1Md++) {
      removeItem(equationList,md-1);
    }
    insertItem(equationList,md-1,calcAns);
    md = 0;
  } else if (equationList[md] == "/") {
    calcAns = (equationList[md-1])/(equationList[md+1]);
    for (var rem2Md = 0; rem2Md < 3; rem2Md++) {
      removeItem(equationList,md-1);
    }
    insertItem(equationList,md-1,calcAns);
    md = 0;
  }
}
for (var as = startingIndex; as < endingIndex; as++) {
  if (equationList[as] == "+") {
    calcAns = (equationList[as-1]) + (equationList[as+1]);
    for (var rem1As = 0; rem1As < 3; rem1As++) {
      removeItem(equationList,as-1);
    }
    insertItem(equationList,as-1,calcAns);
    as = 0;
  } else if (equationList[as] == "-") {
    calcAns = (equationList[as-1]) - (equationList[as+1]);
    for (var rem2As = 0; rem2As < 3; rem2As++) {
      removeItem(equationList,as-1);
    }
    insertItem(equationList,as-1,calcAns);
    as = 0;
  }
}
calcAns = Math.round(calcAns*1000000)/1000000;
return calcAns;
}

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