# Section 3: Iteration & Arrays

1. Demonstrate a use of parseInt that results in NaN

var i1=parseInt("abc123");

2. Write a program to input a decimal number and output the digit which lies in the second decimal place (e.g. 12.345 gives 4, 0.123 gives 2, etc.)

var s=prompt("Enter decimal number");

var i=s.indexOf(".");

alert("The digit at 2nd decimal place in number "+s+" is: "+s.charAt(i+2));

## Exercises 3.4

1. Write a program to find the maximum value in an array.

var v=[10,30,99,22,66,33], max=v[0];

for(i in v)

{

if(max<v[i])max=v[i];

}

alert("Maximum value in array "+v+" is "+max);

2. Write a program to find the index of the maximum value in an array.

var v=[10,30,99,122,122,33], max=v[0],index=-1;

for(i in v)

{

if(max<v[i]){max=v[i];index=i;}

}

alert("The index of the first maximum value in array "+v+" is "+index);

3. Write a program to shift all the values in an array one index lower, with the displaced first element being placed as the last element.

var v=[10,30,99,122,122,33], temp=v[0];

for(i=0;i<v.length-1;i++)

{

v[i]=v[i+1];

}

v[v.length-1]=temp;

alert("Array shifted one index lower is "+v);

4. Write a program to shift all the values in an array one index higher, with the displaced last element being placed as the first element.

var v=[10,30,99,122,122,33], temp=v[v.length-1];

for(i=v.length-1;i>0;i--)

{

v[i]=v[i-1];

}

v[0]=temp;

alert("Array shifted one index higher is "+v);

5. Write a program to find the sum of the elements in an array.

var v=[10,30,20,5,7,33], sum=0;

for(i in v)sum=sum+v[i];

alert("Sum of elements in array is "+sum);

6. Write a program to sum all the odd elements of an array.

var v=[10,30,20,5,7,33], sum=0;

for(i in v){if(v[i]%2)sum=sum+v[i];}

alert("Sum of elements with odd value in array is "+sum);

7. Write a program to sum all the elements at odd indexes of an array.

var v=[10,30,20,5,7,33], sum=0;

for(i in v){if(i%2)sum=sum+v[i];}

alert("Sum of elements at odd indexes in array is "+sum);

8. Write a program to find out if the sum of the negative elements of an array is larger than the sum of the positive elements.

var v=[10,-10,20,30,-20,-31], sum=0;

for(i in v)sum=sum+v[i];

if(sum<0)

{

alert("In array "+v+" the sum of the negative elements is larger than sum of positive elements");

}

else

{

alert("In array "+v+" the sum of the negative elements is NOT larger than sum of positive elements");

}

9. Write a program to reverse the order of all the elements in an array.

var v=[10,11,12,13,14,15,16], vR=[];

for(i in v)vR[i]=v[v.length-1-i];

alert("Array "+v+" reversed is= "+vR);

10. Write a program to move the largest element of the array to the last index, shuffling down smaller elements as required.

//Find first maximum value & first maximum value index

var v=[10,30,99,122,121,33], max=v[0],index=-1;

for(var i=0;i<v.length;i++)

{

if(max<v[i]){max=v[i];index=i;}

}

//Now process from index

for(i=index;i<v.length-1;i++){v[i]=v[i+1];}

v[v.length-1]=max;

alert(v);

11. Write a program to shuffle the elements of an array into ascending order.

//I am assuming a text sort and not numeric sort.

//uncomment line 6 "alert(v)" to see what is happening.

var v=["z","d","b","f","e","c","a"],temp;

for(var i=0;i<v.length-1;i++)

{

// alert(v);

for(var j=0;j<v.length-i-1;j++)

{

if(v[j]>v[j+1]){temp=v[j];v[j]=v[j+1];v[j+1]=temp;}

}

}

alert("Sorted Array: "+v);

## Exercises 3.5

2. Try sorting this out: var v=[-33,-22,-11,0,11,22,33];for(var i=0;v[++i];i++)alert(i);

//Output is the single value "1" because 2nd time round i becomes 3 and hence v[3] becomes 0 which evaluates to "false".

3. Write a for-loop which counts downwards (rather than upwards) and use this to create a string containing the elements of an array in reverse order, i.e. [22,44,11,33] -> "33,11,44,22"

var v=[22,44,11,33], s="",comma=",";

for(var i=v.length-1;i>=0;i--)

{

if(i==0)comma="";

s+=v[i]+comma;

}

alert("string= "+s)

## Exercises 3.6

2. Write a program to check whether a string is palindromic.

var s=prompt("Enter string to test for being palindromic"),pal=true;

for(var i=0;i<Math.floor(s.length/2);i++)if(s.charAt(i)!=s.charAt(s.length-i-1))pal=false;

if(pal)alert("string: "+s+" is palindromic"); else alert("string: "+s+" is NOT palindromic");

3. Write a program to check whether or not two arrays are identical in size, and hold identical values.

var v1=[1,2,3,4,5,6],v2=[1,2,3,4,5],id=true;

if(v1.length!=v2.length)

{

id=false;

}

else

{

for(var i=0;i<v1.length;i++)if(v1[i]!=v2[i])id=false;

}

if(id)

alert("arrays "+v1+" and "+v2+" are identical");

else

alert("arrays "+v1+" and "+v2+" are NOT identical");

4. Write a program to calculate the innerproduct of two arrays (ip of v,w = sum, for all i, of vi\*wi).

var v=[1,2,3],w=[4,5,6],sum=0;

for(var i=0;i<v.length;i++)sum+=v[i]\*w[i];

alert("Inner product of arrays "+v+" and "+w+" is "+sum);

5. Write a program to check that the values of an array follow the fibonacci sequence (vi = vi-1 + vi-2 for i>=2).

var v=[1,2,3,5,8,13,21], fib=true;

for(var i=2;i<v.length;i++)if((v[i-2]+v[i-1])!=v[i])fib=false;

if(fib)

alert(v+" is a fibonnaci sequence");

else

alert(v+" is NOT a fibonnaci sequence");

## Exercises 3.7

## Assignments A3

1. [array assignment] Write a program to process a string called Book and produce the list of words that might appear in the index. Create an array of words by splitting the string at each space, then strip out all the duplicate words, and finally provide the words in dictionary order in the array WordList. [Note: when first testing this program it is expected that your 'Book' will be very short - e.g. one short sentence].

var Book="one two one three two one three four";

var a=Book.split(" ");

var WordList=[],temp;

for(var i=0;i<a.length;i++ )

{

if(WordList.indexOf(a[i])<0)WordList[WordList.length]=a[i];

}

//Now sort WordList into dictionary order

for(var i=0;i<WordList.length-1;i++)

{

//alert(WordList) //uncomment this alert to see bubble sort in action

for(var j=0;j<WordList.length-i-1;j++)

{

if(WordList[j]>WordList[j+1]){temp=WordList[j];WordList[j]=WordList[j+1];WordList[j+1]=temp;}

}

}

alert(WordList);