# Section 4: Conditionals/Iteration II

## Exercises 4.1

2. Write a digit test without using logical operators [hint: string operators]

var c=String(Number(prompt("Enter a character & I will test for it being a digit:")));

if(c=='NaN'){alert("The character is NOT a digit");} else {alert("The character is a digit")};

3. Write an upper/lower case vowel test using logical operators.

var c=prompt("Enter a character & I will test for it being a vowel:").toLowerCase();

if(c=='a'||c=='o'||c=='e'||c=='i'||c=='u')alert("char is a vowel");else alert("char is not a vowel");

4. Write an upper/lower case vowel test without using logical operators.

var c=prompt("Enter a character & I will test for it being a vowel:").toLowerCase(), v="Char is Not a vowel";

if(c=='a')v="Char is a vowel";

if(c=='o')v="Char is a vowel";

if(c=='e')v="Char is a vowel";

if(c=='i')v="Char is a vowel";

if(c=='u')v="Char is a vowel";

alert(v);

5. Write a consonant test [hint:combine the letter and vowel tests].

var c=prompt("Enter a character & I will test for it being a consonant:").toLowerCase();

if(c>='a' && c<='z' && c!='a' && c!='o' && c!='e' && c!='i' && c!='u'){

alert("char is a consonant");}else{alert("char is Not a consonant");

}

## Exercises 4.2

2. Write a program to calculate the scrabble score of a word (a string).

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var word=prompt("Enter Scrabble Word:"),score=0,letter="";

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

letter=word.charAt(i);

switch (letter){

case "A":case "E":case "I":case "L":case "N":case "O":case "R":case "S":case "T":case "U":score=score+1;break;

case "D":case "G":score=score+2;break;

case "B":case "C":case "M":case "P":score=score+3;break;

case "F":case "H":case "V":case "W":case "Y":score=score+4;break;

case "K": score=score+5;break;

case "J":case "X": score=score+8;break;

case "Q":case "Z": score=score+10;break;

default: alert(letter+" is not a scrabble letter");

}

}

alert("Scrabble score of "+word+" is "+score);

//Russian(Cyrillic) Scrabble

var word=prompt("Enter Russian Scrabble Word:"),score=0,letter="";

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

letter=word.charAt(i);

switch (letter){

case "А":case "Б":case "Е":case "И":case "Н":case "О":case "Р":case "С":case "Т":score=score+1;break;

case "Д":case "К":case "Л":case "П":case "У":score=score+2;break;

case "Б":case "Г":case "Ё":case "Ь":score=score+3;break;

case "Й":case "Ы":score=score+4;break;

case "Ж":case "З":case "Х":case "Ц":case "Ч": score=score+5;break;

case "Ш":case "Ю": score=score+8;break;

case "Ф":case "Ъ": score=score+10;break;

default: alert(letter+" is not a Russian scrabble letter");

}

}

alert("Scrabble score of "+word+" is "+score);

## Exercises 4.3

1. Rewrite this program to use autoincrement on i.

var a=[9,5,1,-3, 2];

var i=0;

while(a[i]>=0){

alert(a[i]);

i++;

}

2. Rewrite the program so that the controlled statement is one simple statement (not a compound statement with {}).

var a=[9,5,1,-3, 2];

var i=0;

while(a[i]>=0)alert(a[i++]);

3. The array parties=[2,4,3,1,6,2,3,2,4,3,5,2,1] represents a series of telephone requests for seats from parties wanting to go to a banquet for which the total number of seats is 24. If the requests are to be taken strictly in order of receipt, write a program to calculate how many parties can be accommodated.

var parties=[2,4,3,1,6,2,3,2,4,3,5,2,1], i=-1,seats=0;

while(seats<=24)

{

seats=seats+parties[++i];

}

alert("Number of parties accomodated= "+i);

## Exercises 4.4

1. Fix the 'mistake' in the example above.

var sum=0, sumsq=0;

var user;

do{

user=Number(prompt("number please, end neg"));

if(user>=0){

sum+=user;

sumsq+=user\*user;

}

}while(user>=0);

alert("sum="+sum+"; sumsq="+sumsq);

2. Try writing this program as a pre-check loop. Can it be done? If so which solution is better: pre-check or post-check?

Below is pre-check version. In the case of this loop for this task it does not make much difference whether it is written as a pre-check or a post-check loop.

// pre-check loop

var sum=0, sumsq=0;

var user=0;

while(user>=0)

{

user=Number(prompt("number please, end neg"));

if(user>=0){

sum+=user;

sumsq+=user\*user;

}

}

alert("sum="+sum+"; sumsq="+sumsq);

3. Try writing this program as a for-loop. Can it be done? If so which solution is better: pre-check or post-check or counted?

Yes it can be written as a for loop, as below. I have only used the for loop condition as the other 2 expressions are optional. So I have constructed a pre-check for loop which is essentially the same as the previous while loop. In this case the pre-check, post-check and for-loops are all suitable (IMHO)

// for loop

var sum=0, sumsq=0;

var user=0;

for(;user>=0;)

{

user=Number(prompt("number please, end neg"));

if(user>=0){

sum+=user;

sumsq+=user\*user;}

}

alert("sum="+sum+"; sumsq="+sumsq);

5. Since there is a 'check' in the for-loop it is possible to ask whether the for-loop has a check at the beginning or the end. Is a for-loop a pre-check iteration or post-check iteration?

A for-loop is a pre-check iteration.

6. For the for-loop represented as for(F1;F2;F3)F4 write out an equivalent while-loop. Use this formula to transform a for-loop that you have already written into a while-loop.

F1;

while(F2){

F4;

F3;

}

Using the Scrabble scorer above, here is the for-loop structure converted to a while-loop structure.

var word=prompt("Enter Scrabble Word:"),score=0,letter="";

var i=0;

while(i<word.length){

letter=word.charAt(i);

switch (letter){

case "A":case "E":case "I":case "L":case "N":case "O":case "R":case "S":case "T":case "U":score=score+1;break;

case "D":case "G":score=score+2;break;

case "B":case "C":case "M":case "P":score=score+3;break;

case "F":case "H":case "V":case "W":case "Y":score=score+4;break;

case "K": score=score+5;break;

case "J":case "X": score=score+8;break;

case "Q":case "Z": score=score+10;break;

default: alert(letter+" is not a scrabble letter");

}

i++;

}

alert("Scrabble score of "+word+" is "+score);

## Assignments A4

1. Write a program to copy from one array of numbers to another but leaving out all the negative numbers

var v1=[-10,20,-30,40,50,60],v2=[];

for(var i=0;i<v1.length;i++){

if(v1[i]>=0)v2[v2.length]=v1[i]

}

alert(v2);

2. [Go on to] Write a program to separate an array of words (strings) into two arrays, one with words that begin with capital letters, one with words that begin with lowercase letters.

var a=["fred","Jill","john","Susan","bill"],al=[],au=[],firstChar="";

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

{

firstChar=a[i].charAt(0);

if(firstChar>="A" && firstChar<="Z")

au[au.length]=a[i];

else

al[al.length]=a[i];

}

alert(al);alert(au);

3. [Go on to] Write a program to process an array of names in the form "*title initials surname*", e.g. Guests=["Mr I.J. White", "Mrs K. Brown", "Mr W. East", "Mrs P.A. South", ... ] into two *sorted* arrays of names in the form "*surname initials (no title)*", e.g. Men=["East W.", "White I.J.", ...] and Women=["Brown K.", "South P.A.", ... ].

var guests=["Mr I.J. White","Mrs K. Brown","Mr W. East","Mrs P.A. South"],men=[],women=[],parts=[],temp;

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

{

parts=guests[i].split(" ");

if(parts[0]=="Mrs")

women[women.length]=parts[2]+" "+parts[1];

else

men[men.length]=parts[2]+" "+parts[1];

}

//sort men

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

{

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

{

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

}

}

//same sort for women

alert(men);alert(women);

4. Write a program input a string in hexadecimal (e.g. "1AF") and compute the corresponding decimal string (e.g. "431"). [Hints: you may like to start with a binary or octal converter before moving on to hexadecimal. Can you find a good use for the switch statement?].

var hex=prompt("Enter Hex Number:"),TDvalue=0,Dvalue=0,Hdigit="";

for(i=0;i<hex.length;i++)

{

Hdigit=hex.charAt(i);

switch(Hdigit)

{

case "0": case "1": case "2": case "3": case "4": case "5": case "6":

case "7": case "8": case "9": Dvalue=Number(Hdigit);break;

case "A": Dvalue=10;break;

case "B": Dvalue=11;break;

case "C": Dvalue=12;break;

case "D": Dvalue=13;break;

case "E": Dvalue=14;break;

case "F": Dvalue=15;break

default: Dvalue=0;

}

TDvalue=TDvalue+(Dvalue\*Math.pow(16,(hex.length-i-1)));

}

alert("Hex= "+hex+" Decimal= "+TDvalue);

//

//alternatively use parseInt(string,base)

//

alert("Hex= "+hex+" Decimal via parseInt= "+parseInt(hex,16));