Extra exercise 1

Write a program that asks the user to introduce two vectors of letters of the same length (one vector after the other). Then the program indicates how many letters in the vectors appear in the same positions.

Example of execution:

```
Introduce the length of the vectors: 3
Letters for the first vector
Introduce a letter: c
Introduce a letter: a
Introduce a letter: t
Letters for the second vector
Introduce a letter: b
Introduce a letter: a
Introduce a letter: t
The number of letters that appear in the same position in
the vectors is 2.
```

SOLUTION

```
clear;
vectsize = input('Introduce the length of the vectors: ');
vect1 = [];
vect2 = [];
disp('Letters for the first vector');
for i = 1:vectsize
  vect1(i) = input('Introduce a letter: ','s');
end
disp('Letters for the second vector');
for j = 1:vectsize
  vect2(j) = input('Introduce a letter: ','s');
end
equals = 0;
for k = 1:vectsize
    if (vect1(k) == vect2(k))
        equals = equals + 1;
    end
end
fprintf('The number of letters that appear in the same position in the
vectors is %d.\n', equals);
```


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Example of execution:

```
Introduce the length of the first vector: 5
Letters for the first vector
Introduce a letter: b
Introduce a letter: o
Introduce a letter: o
Introduce a letter: t
Introduce a letter: s
Introduce the length of the second vector: 3
Letters for the second vector
Introduce a letter: l
Introduce a letter: o
Introduce a letter: t

Introduce the letter to search: o
The number of occurrences of the letter o in the vectors is
3
```

SOLUTION

```
clear;
vectsize1 = input('Introduce the length of the first vector: ');
disp('Letters for the first vector');
vect1 = [];
for i = 1:vectsize1
  vect1(i) = input('Introduce a letter: ','s');
end
vectsize2 = input('Introduce the length of the second vector: ');
vect2 = [];
disp('Letters for the second vector');
for i = 1:vectsize2
  vect2(i) = input('Introduce a letter: ','s');
end

letter = input('Introduce a letter to search: ','s');
count = 0;
for val1=vect1
    if (val1 == letter)
        count = count + 1;
    end
end
for val2=vect2
    if (val2 == letter)
        count = count + 1;
    end
```

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Extra exercise 3

Modify the previous program so that it asks for two letters to search. At the end, the program tells the user which letter appears more often in the first vector, which letter appears more often in the second vector, and which letter appears more often in total.

Example of execution:

```
Introduce the length of the first vector: 5
Letters for the first vector
Introduce a letter: b
Introduce a letter: o
Introduce a letter: o
Introduce a letter: t
Introduce a letter: s
Introduce the length of the second vector: 3
Letters for the second vector
Introduce a letter: l
Introduce a letter: o
Introduce a letter: t

Introduce a letter to search: o
Introduce another letter to search (a different one): t

In the first vector the letter o appears more often.
In the second vector the two letters appear the same number
of times.
In total the letter o appears more often.
```

SOLUTION

```
clear;
vectsize1 = input('Introduce the length of the first vector: ');
vect1 = [];
disp('Letters for the first vector');
for i = 1:vectsize1
  vect1(i) = input('Introduce a letter: ','s');
end
vectsize2 = input('Introduce the length of the second vector: ');
vect2 = [];
disp('Letters for the second vector');
for i = 1:vectsize2
```

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```
for val=vect1
    if (val == letter1)
        countV1L1 = countV1L1 + 1;
    elseif (val == letter2)
        countV1L2 = countV1L2 + 1;
    end
end

if (countV1L1 == countV1L2)
    disp('In the first vector the two letters appear the same number
of times.');
else
    if (countV1L1 > countV1L2)
        rdo = letter1;
    else
        rdo = letter2;
    end
    fprintf('In the first vector the letter %c appears more often\n',
rdo);
end

% Search for both letters in vector 1
countV2L1 = 0;
countV2L2 = 0;

for val=vect2
    if (val == letter1)
        countV2L1 = countV2L1 + 1;
    elseif (val == letter2)
        countV2L2 = countV2L2 + 1;
    end
end

if (countV2L1 == countV2L2)
    disp('In the second vector the two letters appear the same number
of times.');
else
    if (countV2L1 > countV2L2)
        rdo = letter1;
    else
        rdo = letter2;
    end
    fprintf('In the second vector the letter %c appears more often\n',
rdo);
end

totalL1 = countV1L1 + countV2L1 ;
totalL2 = countV1L2 + countV2L2 ;

if (totalL1 == totalL2)
    disp('In total the two letters appear the same number of times.');
```


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Extra exercise 4

Write a program that calculates how many episodes of a tv show the user has left to watch before finishing the show. To do this, the program will first ask the user the number of seasons that the show has, and the number of episodes per season. Then, it will ask the user the season and episode number of the last episode they watched. Last, it will calculate and show how many episodes the user has left to watch.

Example of execution:

```
How many seasons does your show have? 3
How many episodes does season 1 have? 10
How many episodes does season 2 have? 9
How many episodes does season 3 have? 7
What is the season of the last episode you watched? 2
What is the number of the last episode you watched? 1
You still have 15 episodes left to finish your show
```

SOLUTION

```
clear;
% ask for number of seasons and episodes
seasons = input ('How many seasons does your show have? ');
episodes = zeros(1,seasons);
for i = 1:seasons
    fprintf('How many episodes does season %d have? ', i);
    episodes(i) = input('');
end
c
current_season = input('What is the season of the last episode you
watched? ' );
current_episode = input('What is the number of the last episode you
watched? ' );
% calculate remaining episodes
count = episodes(current_season) - current_episode; % episodes left in
current season
for i = current_season+1:seasons
    count = count + episodes(i); % episodes left in the remaining
seasons
end
% print result
if count == 0
    disp('You don''t have any episodes left to watch');
else
    fprintf('You still have %d episodes left to finish your show\n',
```

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Extra exercise 5

Write a program that asks the user to introduce the size of a vector and numbers to fill it. Next, it tells the user how many consecutive numbers (a number that is one value higher than the previous number in the vector) are in the vector.

The output of an execution could look like this:

```
Introduce the length of the vector: 7
Introduce a number: 2
Introduce a number: 3
Introduce a number: 1
Introduce a number: 10
Introduce a number: 11
Introduce a number: 12
Introduce a number: 8
There are 3 consecutive numbers.
```

Note: the consecutive numbers in this example are 3, 11 and 12 (3 is consecutive to 2, 11 to 10 and 12 to 11).

SOLUTION

```
clear;
vectsize = input('Introduce the length of the vector: ');
vect = zeros(1,vectsize);
for i = 1:vectsize
  vect(i) = input('Introduce a number: ');
end

cont = 0;
for j = 2:length(vect)
    if vect(j) == (vect(j-1) + 1)
        cont = cont + 1;
    end
end
fprintf('\n The are %d consecutive numbers\n',cont);
```


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