Example questions Matlab exam

Note that the total number of points on the exam is 20 p. These example questions gives max 14 p.

**Example 1 (2p)**

You have the matrix below:

\[
A = \begin{bmatrix}
1 & 2 & 3 & 4 \\
5 & 6 & 7 & 8 \\
9 & 10 & 11 & 12
\end{bmatrix}
\]

What will be displayed by the code: \(A(2:3,2:3)\)

**Example 2 (2p)**

The code below is written to find the highest and the lowest daily temperature, as well as average temperature in June in Lund. There is one mistake in the code that most likely will give the wrong result, which?

```matlab
load dailyJune.txt
min = 0;
max = 0;
total = 0;
for i = 1:length(dailyJune)
    if dailyJune(i) < min
        min = dailyJune(i);
    end
    if dailyJune(i) > max
        max = dailyJune(i);
    end
    total = total + dailyJune(i);
end
meanTemp = total/length(dailyJune)
```

Example 3 (2p)

What will be displayed when you run the code below?

```matlab
a = 0;
while a < 10
    a = a + 3;
end

disp(a)
```

Example 4 (2p)

The code below is written to count the number of successes for 1-6 number of eyes when rolling a dice a great number of time. A user gives an input of 10000 and the result seems to be correct at a first glance:

1 - 1624  2 - 1624  3 - 1623  4 - 1625  5 - 1622  6 – 1625

But the sum is 9743 and it should be 10000. Find the mistake in the code and explain why the result is not correct.

```matlab
nbrRolls = input('Please give the number of rolls (min 10 000): ');

% For counting the number of rolls per result i.e. 1-6.
counter = zeros(1, 6);

for roll=1:nbrRolls
    counter(randi(6)) = counter(randi(6)) + 1;
end
```

Example 5 (2p)

The header below describes a function that can be used to encrypt a string. How would you call that function in Matlab?

```matlab
function [ encryptStr ] = encrypt( originalStr, offset )
%encrypt - this function performs a simple encryption of a given string.
%Each character is converted by the given offset in the ASCII table.
```
**Example 6 (4p)**

A Boolean expression is an expression that is evaluated to either *true* or *false*. You have used Boolean expressions as conditions in e.g. if-statements.

You are rolling two dice, *die1* and *die2*. Write expressions to find:

a) A result when one die shows 2 eyes and the other more than 3 eyes. (1p)

b) A result when both dice show less than 2 eyes. (1p)

c) A result when the sum of the two dice is larger than 8 eyes. (1p)

d) A result when the difference between the dice is larger than 2. (1p)