Lab #6

Contents

1 While loops

While loop repeats code while the condition is true.

The basic syntax is:

```
while condition
    code
end
```

For example:

```
clear;

n = 5;

while n > 1
    n = n-1;
    disp(n);
end
```

1.1 Infinite loops

Be careful, an infinite loop (it is a loop which never ends on its own) is possible with `while`, for example

```
% This loop will be running forever
clear;

n = 5;

while n > 1 % initially n > 1
    n = n+1; % and we increasing n each iteration,
       hence the loop will never end
    disp(n);
end
```

1.2 break statement

`break` statement stops the loop immediately. No further iterations will be done. This statement works with both `while` and `for` loops.

In the following example we use `break` to exit the infinite cycle.

```
% This loop will be running forever
clear;

n = 5;
while n > 1
    n = n+1;

    if n > 100 % when n > 100
        break % we stop the loop
    end
    disp(n);
end
```

The following code will stop printing after 3 because the loop is terminated when `a == 4`.

```
clear;

for a=1:5
    if a == 4
```

```
        break
    end

    disp(a);
end
```

In the following example the loop stops when the user chooses 0 as the input.

```
clear;
secret = 3;
guess = 0;

while guess ~= secret
    guess = input('Guess my secret number between 1
       and 10 (to exit enter 0 ):');

    if guess == 0
        disp('You chose to exit.');
        break
    end

    if guess == secret
        disp('Correct!');
    else
        disp('Try again >>');
    end
end
```

Also this program can be implemented using infinite loops:

```
clear;
secret = 3;
guess = 0;

while 1 == 1 %force the loop to be infinite
    guess = input('Guess my secret number between 1
       and 10 (to exit enter 0 ):');

```

```
    if guess == 0
        disp('You chose to exit.');
        break
    end

    if guess == secret
        disp('Correct!');
        break
    else
        disp('Try again >>');
    end
end
```

1.3 continue statement

`continue` statement allows to skip the rest part of the code in current iteration and to go to the next iteration of the loop. This statement works with both `while` and `for` loops.

In the following example "Hello, world!" text will not be printed, because `continue` is the first statement in the for loop.

```
clear;

for a=1:5
    continue

    disp('Hello, world!');
end
```

And the following code will print "Hello, world!" 5 times and "Good bye, world!" only 3 times because of the `continue` command before the second `disp` command.

```
clear;

for a=1:5
    disp('Hello, world!');

    if a > 3
        continue
    end
```

```
9
10      disp('Good bye, world!');
11  end
```

2 Task #12

Write a program which prints text "Hello, World!" 5 times using `while` loop.

3 Task #13

Implement Euclidean GCD algorithm from lecture slides on Matlab (`https://docs.google.com/presentation/d/1JmBCX4HxZN_ew7aiV_9u22gqHRt9NbIBw4Ag9ke1k7o/edit#slide=id.p19`)

4 Task #14

Modify Task #2 using a while loop so that the program asks for user input and computes taxes again and again until the user puts `-1` as an input salary. This way the program can be used to compute taxes many times without rerunning it.