

SGN-84007 Introduction to Matlab

Exercise Set 3: September 13–16, 2016

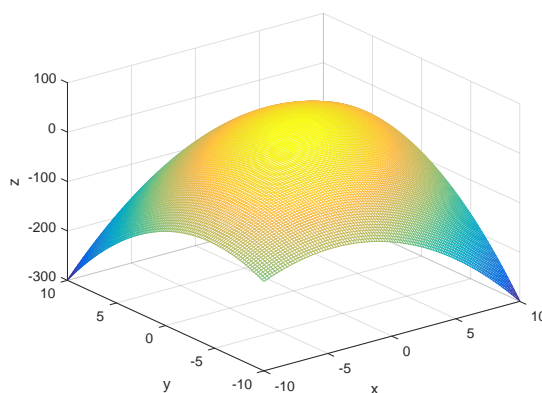
Exercises/pages refer to Hahn&Valentine: Essential Matlab for Engineers and Scientists (5th Edition)

1.-2. Draw the graph (= 3-dimensional surface) of the function

$$f(x, y) = -x^2 - y^2 + xy + x + y + 0.8$$

in the range $x \in [-10, 10]$ and $y \in [-10, 10]$. Draw the (same) graph three times using commands `plot3`, `surf`, and `mesh`. Instruction: Your m-file should look like this (prepare to explain the meaning of each row):

```
f = @(x,y) ... ;  
[x,y] = meshgrid( ... );  
z = ... ;  
figure(1);  
plot3( ... );  
figure(2);  
surf( ... );  
figure(3);  
mesh( ... );
```



3.-4. Familiarize yourself with the multidimensional Newton-Raphson method e.g. here:

<http://fourier.eng.hmc.edu/e161/lectures/ica/node13.html>

Implement it in Matlab for functions of two arguments. Apply it to the function f of Problem 1.-2. to find numerically the same maximum which you found experimentally (graphically) in Problem 1.-2.

5. Find the same minimum using this Matlab function:

<http://se.mathworks.com/help/matlab/ref/fminsearch.html>