

**Exercise 2**  
**Scientific Data Visualization**  
**CSCE 5320 – Spring 2021**  
**Distributed: Wednesday, January 27**  
**Due: Thursday, February 11**

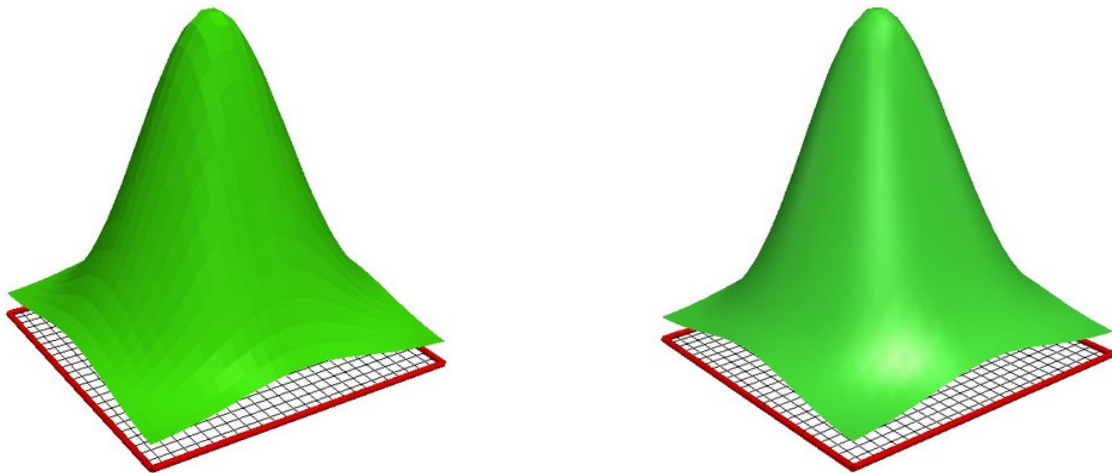
*[Solutions to this assignment must be submitted via CANVAS prior to midnight on the due date. Submissions no more than one day late will not be penalized. Submissions up to one week late will be penalized 10 points. Submissions more than week late and less than two weeks late will be penalized 20 points. Submissions will not be accepted after two weeks. THIS IS AN INDIVIDUAL ASSIGNMENT]*

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**Purpose:** Learn to use a language/package that creates shading of an elevation plot.

**What to do:** Consider again the plot of a two-variable function  $z = f(x,y)$  as in Section 2.1 of Chapter 2 of the text. Assume you know the ranges of interest  $[x_{min}, x_{max}]$  and  $[y_{min}, y_{max}]$  of the two independent variables.

$f(x,y) = e^{-(x^2+y^2)}$ . Consider the range  $X=[-1,1]$  and  $Y=[-1,1]$  which is divided into a 30x30 grid. You are to implement two cases. For case (i), provide the elevation plot superimposed on a domain plane with flat shading using the color green. For case (ii), provide the elevation plot superimposed on a domain plane with Gouraud (smooth) shading, again using the color green. Examples are given in the figure below. Don't expect to precisely replicate them.



*Figure: Examples of Flat Shading (on left) and Smooth Shading (on right)*

**Grading consideration:** If you are successful in creating both instances of each case (that is, with and without domain plane) the maximum grade will be 100 points. If either of the two plots is missing, the maximum grade will be 90 points.

**Hand-in:** (i) The two elevation plots with shading; (ii) the computer code; (iii) a list of significant sources of information (websites, etc.); (iv) a discussion of what you found to be most challenging about the assignment (10 points allocated on the grading scale).