

Assessment: Jacobians and Hessians

Graded Quiz - 20 min

Moving to multivariate  
Jacobians - vectors of  
derivatives

The sandpit game

Video: The Sandpit  
4 min

Notebooks: The Sandpit  
30 min

Notebooks: The Sandpit -  
Part 2  
30 min

Video: The Hessian  
5 min

Practice Quiz: Calculating  
Hessians  
5 questions

Video: Reality is hard  
4 min

Quiz: Assessment: Jacobians  
and Hessians  
5 questions

Video: See you next  
module!  
23 sec

QUIZ - 20 MIN

✔ Congratulations! You passed!  
TO PASS 80% or higher

Keep Learning

GRADE  
100%

Assessment: Jacobians and Hessians

Assessment: Jacobians and Hessians

LATEST SUBMISSION GRADE  
100%

Try again

Submit your assignment  
DUE May 11, 2:59 AM EDT ATTEMPTS 3 every 8 hours

TO PASS 80% or higher

1. In this assessment, you will be tested on all of the different topics you have in covered this module. Good luck!

Grade  
100%

View Feedback

Calculate the Jacobian of the function  $f(x,y,z) = x^2 \cos(y) + e^x \sin(y)$  and evaluate at the point  $(x,y,z) = (\pi, \pi, 1)$ .

☐  $J(x,y,z) = (-2\pi, -\pi, 1)$

☐  $J(x,y,z) = (-2\pi, e, 0)$

☒  $J(x,y,z) = (-2\pi, -\pi, 0)$

☐  $J(x,y,z) = (-2\pi, e, 1)$

Correct  
Well done!

2. Calculate the Jacobian of the vector valued functions:  
 $u(x,y) = x^2y - \cos(x)\sin(y)$  and  $v(x,y) = e^{x^2y}$  and evaluate at the point  $(0, \pi)$ .

☐  $\begin{bmatrix} 0 & e^\pi \\ 1 & e^\pi \end{bmatrix}$

☐  $\begin{bmatrix} e^\pi & 1 \\ e^\pi & 0 \end{bmatrix}$

☒  $\begin{bmatrix} 0 & 1 \\ e^\pi & e^\pi \end{bmatrix}$

☐  $\begin{bmatrix} e^\pi & 1 \\ 0 & e^\pi \end{bmatrix}$

Correct  
Well done!

3. Calculate the Hessian for the function  $f(x,y) = x^2 \cos(y) - x \sin(y)$ .

☐  $H = \begin{bmatrix} 6\cos(y) & -3x^2\sin(y) - \cos(y) \\ -3x^2\sin(y) - \cos(y) & x^2\sin(y) - x^3\cos(y) \end{bmatrix}$

☐  $H = \begin{bmatrix} 6x^2\cos(y) & -3x^2\sin(y) - \cos(x) \\ -3x^2\sin(y) - \cos(y) & x\sin(y) - 3\cos(x) \end{bmatrix}$

☐  $H = \begin{bmatrix} 6\cos(x) & -3x^2\sin(y) - \cos(y) \\ -3x^2\sin(y) - \cos(x) & x\sin(y) - y^3\cos(x) \end{bmatrix}$

☒  $H = \begin{bmatrix} 6x\cos(y) & -3x^2\sin(y) - \cos(y) \\ -3x^2\sin(y) - \cos(y) & x\sin(y) - x^3\cos(y) \end{bmatrix}$

Correct  
Well done!

4. Calculate the Hessian for the function  $f(x,y,z) = xy + \sin(y)\sin(z) + x^3e^z$ .

☒  $H = \begin{bmatrix} x^2z^3 & 1 & 3x^2z^2 \\ 1 & -\sin(y)\sin(z) & \cos(y)\cos(z) \\ 3x^2z^2 & \cos(y)\cos(z) & 6e^z - \sin(y)\sin(z) \end{bmatrix}$

☐  $H = \begin{bmatrix} -x^2z^3 & 0 & 3x^2z^2 \\ 1 & \sin(y)\sin(z) & \cos(y)\cos(z) \\ 3x^2z & \cos(y)\cos(z) & 6e^{<div>5. Calculate the Hessian for the function  $f(x,y,z) = z\cos(x) - \sin(x)e^yz^2$  and evaluate at the point  $(x,y,z) = (0,0,0)$ .$

https://www.coursera.org/learn/multivariate-calculus-machine-learning/exam/xqT6m/assessment-jacobians-and-hessians/view-attempt

1/1