Assessment: Jacobians and Hessians

LATEST SUBMISSION GRADE

100%

1.Question 1

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

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

1 / 1 point

- J(x, y, z) = (-2* π, e, 0)
- J(x, y, z) = (-2* π, -e, 0)
- J(x, y, z) = (-2* π, e, 1)
- J(x, y, z) = (-2* π, -e, 1)

2.Question 2

Calculate the Jacobian of the vector valued functions:

u(x, y) = x^2y - cos(x)sin(y) and v(x, y) = e^{x+y} and evaluate at the point (0,π).

1 / 1 point

- $[e_\pi 01 e_\pi]$
- $[e_\pi e_\pi 10]$
- [[0 1], [$e^{\wedge}\pi$ $e^{\wedge}\pi$]]
- $[01 e_\pi e_\pi]$

3.Question 3

Calculate the Hessian for the function f(x, y) = x^3cos(y) - xsin(y).

1 / 1 point

- H = [[$6xcos(y) - 3x^{\wedge}(2)sin(y) - cos(y)$], [$-3x^{\wedge}(2)sin(y) - cos(y)$ $xsin(y) - x^{\wedge}(3)cos(y)$]]
- H = $[6x_2 cos(y) - 3x_2 sin(y) - cos(y) - 3x_2 sin(y) - cos(x) xsin(y) - xcos(y)]$
- H = $[6cos(y) - 3x_2 sin(y) - cos(y) - 3x_2 sin(y) - cos(y_2) x_2 sin(y) - x_3 cos(y)]$
- H = $[6cos(x) - 3x_2 sin(y) - cos(y) - 3x_2 sin(y) - cos(y) xsin(y) - y_3 cos(x)]$

4.Question 4

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

1 / 1 point

- ○ H = $\left[2e^{x}z^{3} 0 3e^{x}z^{2} 1 - sin(x) sin(z) cos(y) cos(z) e^{x}z^{2} cos(y) cos(z) 6e^{2x} - sin(y) sin(x) \right]$
- ◉ H =[[$e^{x}z$^3 1 3$e^{x}z$^2], [1 $-sin(y)sin(z)$ $cos(y)cos(z)$], [3$e^{x}z$^2 $cos(y)cos(z)$ 6$e^{x}z - sin(y)sin(z)$]]
- ○ H = $\left[-e^{x}z^{3} 1 3e^{x}z 0 sin(y) sin(z) cos(y) cos(z) 3e^{y}z^{2} cos(y) cos(z) 6e^{-xz} - sin(y) sin(z) \right]$
- ○ H = $\left[3e^{x}z^{2} 1 3e^{x}z - 1 - sin(x^{2}) sin(z) cos(y) cos(z) 3e^{x}z cos(y) cos(z) 6e^{y}z 2 - sin(y) sin(z) \right]$

5.Question 5

Calculate the Hessian for the function f(x, y, z) = xycos(z) - sin(x)e^yz^3 and evaluate at the point (x, y, z) = (0, 0, 0)

1 / 1 point

- ○ H = $\left[010001000 \right]$
- ○ H = $\left[000101000 \right]$
- ○ H = $\left[010000010 \right]$
- ◉ H =[[0 1 0], [1 0 0], [0 0 0]]