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NPTEL (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » Data Science For Engineers (course)



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Course outline

How does an NPTEL
online course work? ()

Setup Guide ()

Pre Course Material ()

Week 5: Assignment 5

The due date for submitting this assignment has passed.

Due on 2023-08-30, 23:59 IST.

As per our records you have not submitted this assignment.

1) The values of μ_1 , μ_2 and μ_3 while evaluating the Karush-Kuhn-Tucker (KKT) condition with all the constraints being inactive are **1 point**



$$\mu_1 = \mu_2 = \mu_3 = 1$$



$$\mu_1 = \mu_2 = \mu_3 = 0$$



$$\mu_1 = \mu_3 = 0, \mu_2 = 1$$



$$\mu_1 = \mu_2 = 0, \mu_3 = 1$$

Week 0 ()

Week 1 ()

Week 2 ()

Week 3 ()

Week 4 ()

Week 5 ()

- ☐ Multivariate Optimization With Equality Constraints (unit? unit=63&lesson=64)
- ☐ Multivariate Optimization With Inequality Constraints (unit? unit=63&lesson=65)
- ☐ Introduction to Data Science (unit? unit=63&lesson=66)
- ☐ Solving Data Analysis Problems - A Guided Thought Process (unit? unit=63&lesson=67)
- ☐ Dataset (unit? unit=63&lesson=68)

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $\mu_1 = \mu_2 = \mu_3 = 0$

2) Gradient based algorithm methods compute

- ☐ only step length at each iteration
- ☐ both direction and step length at each iteration
- ☐ only direction at each iteration
- ☐ none of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
both direction and step length at each iteration

3) The point on the plane $x + y - 2z = 6$ that is closest to the origin is

- ☐ (0,0,0)
- ☐ (1,1,1)
- ☐ (-1,1,2)
- ☐ (1,1,-2)

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $(1, 1, -2)$

4) Find the maximum value of $f(x, y) = 49 - x^2 - y^2$ subject to the constraints $x + 3y = 10$.

- ☐ 49
- ☐ 46
- ☐ 59
- ☐ 39

1 point

1 point

1 point

☐ FAQ (unit?
unit=63&lesson=69)

☐ Practice: Week 5:
Assignment 5 (Non
Graded) (assessment?
name=145)

☐ Quiz: Week 5:
Assignment 5
(assessment?
name=171)

☐ Week 5 Feedback Form :
Data Science For
Engineers (unit?
unit=63&lesson=157)

☐ Week 5: Solution (unit?
unit=63&lesson=173)

Week 6 ()

Week 7 ()

Week 8 ()

Text Transcripts ()

Download Videos ()

Books ()

Problem Solving
Session - July 2023 ()

No, the answer is incorrect.
Score: 0

Accepted Answers:
39

5) The minimum value of $f(x, y) = x^2 + 4y^2 - 2x + 8y$ subject to the constraint $x + 2y = 7$ occurs at the below point:

1 point

☐ (5,5)

☐ (-5,5)

☐ (1,5)

☐ (5,1)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(5,1)

6) Which of the following statements is/are **NOT TRUE** with respect to the multi variate optimization?

1 point

I - The gradient of a function at a point is parallel to the contours

II- Gradient points in the direction of greatest increase of the function

III - Negative gradients points in the direction of the greatest decrease of the function

IV - Hessian is a non-symmetric matrix

☐

I

☐

II and III

☐

I and IV

☐

III and IV

No, the answer is incorrect.
Score: 0

Accepted Answers:
I and IV

7) The solution to an unconstrained optimization problem is always the same as the solution to the constrained one.

1 point

- ☐ True
☐ False

No, the answer is incorrect.

Score: 0

Accepted Answers:

False

8) A manufacturer incurs a monthly fixed cost of \$7350 and a variable cost, $C(m) = 0.001m^3 - 2m^2 + 324m$ dollars. The revenue generated by selling these units is, $R(m) = -6m^2 + 1065m$. How many units produced every month (m) will generate maximum profit? 1 point

- ☐ $m = 46$
☐ $m = 90$
☐ $m = 231$
☐ $m = 125$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$m = 90$

9) Consider an optimization problem $\min_{x_1, x_2} x^2 - xy + y^2$ subject to the constraints

1 point

$$\begin{aligned} 2x + y &\leq 1 \\ x + 2y &\geq 2 \\ x &\geq -1 \end{aligned}$$

Find the lagrangian function for the above optimization problem.



☐ $L(x, y, \mu_1, \mu_2, \mu_3) = x^2 - xy + y^2 + \mu_1(2x + y - 1) + \mu_2(2 - x - 2y) + \mu_3(-x - 1)$

☐ $L(x, y, \mu_1, \mu_2, \mu_3) = x^2 - xy + y^2 + \mu_1(2x + y - 1) + \mu_2(x + 2y - 2) + \mu_3(-x - 1)$

☐ $L(x, y, \mu_1, \mu_2, \mu_3) = x^2 - xy + y^2 + \mu_1(2x + y - 1) + \mu_2(x + 2y - 2) + \mu_3(x + 1)$

☐ $L(x, y, \mu_1, \mu_2, \mu_3) = x^2 - xy + y^2 + \mu_1(1 - 2x - y) + \mu_2(2 - x - 2y) + \mu_3(-x - 1)$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$L(x, y, \mu_1, \mu_2, \mu_3) = x^2 - xy + y^2 + \mu_1(2x + y - 1) + \mu_2(2 - x - 2y) + \mu_3(-x - 1)$