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anikets349@gmail.com ▾

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


Course outline

How does an NPTEL online course work?

Setup Guide

Pre Course Material

Week 0

Week 1

Week 2

Week 3

Week 4

Week 5

☐ Multivariate Optimization With Equality Constraints (unit? unit=64&lesson=65)

☐ Multivariate Optimization With Inequality Constraints

Week 5: Assignment 5

The due date for submitting this assignment has passed.

Due on 2021-09-01, 23:59 IST.

Assignment submitted on 2021-08-31, 19:43 IST

 1) The function $\min f(x, y) = 3x + y$ subject to the given constraints $x^2 + y^2 < 10$ **1 point** is an example of

- ☐ Unconstrained multivariate optimization
☐ Multivariate optimization with equality constraint
☒ Multivariate optimization with inequality constraint
☐ None of the above

Yes, the answer is correct.

Score: 1

Accepted Answers:

Multivariate optimization with inequality constraint

 2) We intend to find the maxima of $f(x, y) = 3x + y$ subject to the constraint $x^2 + y^2 = 10$. The Lagrangian function is:- **1 point**

- ☐ $L(x, y, \lambda) = 3x + y$
☐ $L(x, y, \lambda) = \lambda(3x + y - 10)$
☒ $L(x, y, \lambda) = 3x + y + \lambda(10 - x^2 - y^2)$
☐ None of the above

Yes, the answer is correct.

Score: 1

Accepted Answers:

 $L(x, y, \lambda) = 3x + y + \lambda(10 - x^2 - y^2)$

(unit?
unit=64&lesson=66)

☒ Introduction to
Data Science
(unit?
unit=64&lesson=67)

☐ Solving Data
Analysis
Problems - A
Guided
Thought
Process (unit?
unit=64&lesson=68)

☐ Dataset (unit?
unit=64&lesson=69)

☐ FAQ (unit?
unit=64&lesson=70)

☐ Week 5
Feedback
Form: Data
Science for
Engineers
(unit?
unit=64&lesson=71)

☐ Practice: Week
5: Assignment
5 (Non
Graded)
(assessment?
name=124)

☒ **Quiz: Week 5:
Assignment 5
(assessment?
name=134)**

☒ Week 5:
Solutions
(unit?
unit=64&lesson=141)

Week 6

Week 7

Week 8

Text Transcripts

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3) The values of the stationary points x^* , y^* and λ^* for the objective function $f(x, y) = 3x + y$ subject to the given constraints $x^2 + y^2 - 10 = 0$ are.

1 point

☐

$$x^* = \pm 3, y^* = \pm 1 \text{ and } \lambda^* = \pm 0.5$$

☐

$$x^* = \pm 2, y^* = \pm 1 \text{ and } \lambda^* = \pm 5$$

☐

$$x^* = y^* = \lambda^* = -2$$

☐

None of the above

Yes, the answer is correct.

Score: 1

Accepted Answers:

$$x^* = \pm 3, y^* = \pm 1 \text{ and } \lambda^* = \pm 0.5$$

4) The values of the stationary points x^* , y^* and λ^* for the objective function $f(x, y) = 5x - 3y$ subject to the given constraints $x^2 + y^2 = 136$ are.

1 point

☐

$$x^* = \pm 9, y^* = \pm 5 \text{ and } \lambda^* = \pm 0.5$$

☒

$$x^* = \pm 10, y^* = \pm 6 \text{ and } \lambda^* = \pm 0.25$$

☐

$$x^* = y^* = \lambda^* = -10$$

☐

None of the above

Yes, the answer is correct.

Score: 1

Accepted Answers:

$$x^* = \pm 10, y^* = \pm 6 \text{ and } \lambda^* = \pm 0.25$$

5) The hessian matrix for the function $f(x, y) = -5x^2 + 4xy + 3y^2 + 2x - y$

1 point

☐

$$\begin{bmatrix} 4 & 10 \\ 10 & 6 \end{bmatrix}$$

☐

$$\begin{bmatrix} 3 & 5 \\ 5 & 4 \end{bmatrix}$$

☒

$$\begin{bmatrix} -10 & 4 \\ 4 & 6 \end{bmatrix}$$

☐

None of the above

Yes, the answer is correct.

Score: 1

Accepted Answers:

$$\begin{bmatrix} -10 & 4 \\ 4 & 6 \end{bmatrix}$$

6) The eigen values for the hessian matrix obtained in Q5 are: -

1 point

☐

$$-10.944272, 6.944272$$

☐

$$10.472136, 2.527864$$

☒

$$6.45258, 3.556886$$

☐ None of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

-10.944272, 6.944272

7) A predictive modeling problem where the class label is predicted for the input data is **1 point** a type of

☐ Function approximation problem

☒ Classification problem

Yes, the answer is correct.

Score: 1

Accepted Answers:

Classification problem