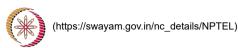
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NPTEL (https://swayam.gov.in/explorer?ncCode=NPTEL) » Data Science for Engineers (course)



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

Optimization With Equality Constraints (unit?

Multivariate

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 1 point $x^2 + y^2 = 10$. The Lagrangian function is:-

$$L(x, y, \lambda) = 3x + y$$

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

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

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)
- O 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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Books

- 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.
 - $x^*=\pm 3, y^*=\pm 1 ext{ and } \lambda^*=\pm 0.5$
 - $x^*=\pm 2, y^*=\pm 1$ and $\lambda^*=\pm 5$

 - $x^*=y^*=\lambda^*=-2$ None of the above

Yes, the answer is correct.

Score: 1

Accepted Answers:

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

- 4) The values of the stationary points x^*, y^* and λ^* for the objective function **1 point** f(x,y)=5x-3y subject to the given constraints $x^2+y^2=136$ are.
 - $x^*=\pm 9, y^*=\pm 5 ext{ and } \lambda^*=\pm 0.5$
 - $x^*=\pm 10, y^*=\pm 6 ext{ and } \lambda^*=\pm 0.25$
 - $x^* = y^* = \lambda^* = -10$
 - 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
 - $\begin{bmatrix} 4 & 10 \\ 10 & 6 \end{bmatrix}$
 - 10 6
 - $\begin{bmatrix} 3 & 5 \\ 5 & 4 \end{bmatrix}$
 - $\left[egin{array}{ccc} -10 & 4 \ 4 & 6 \ \end{array}
 ight]$
 - None of the above

Yes, the answer is correct.

Score: 1

Accepted Answers:

$$\left[egin{array}{cc} -10 & 4 \ 4 & 6 \end{array}
ight]$$

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

1 point

1 point

- -10.944272, 6.944272
- 10.472136, 2.527864
- 0 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 <i>1 point</i> a type of
Function approximation problem
Classification problem
Yes, the answer is correct. Score: 1
Accepted Answers:
Classification problem