

MITx: 15.053x Optimization Methods in Business Analytics

Heli

Bookmarks

- General Information
- ▶ Week 1
- ▶ Week 2
- ▶ Week 3
- Week 4
- Week 5
- ▼ Week 6

Lecture

Lecture questions due Oct 18, 2016 at 19:30 IST

Recitation

Problem Set 6

Homework 6 due Oct 18, 2016 at 19:30 IST

Week 6 > Problem Set 6 > Problem 1

Problem 1

 \square Bookmark this page

PART A

1/1 point (graded)

Consider the NLP formulation below

- Decision variables: x_1, x_2
- Objective value: z

Formulation:

What is the (rounded) optimal solution?

$$x_1 = 1, x_2 = 0$$

 $z = 506.25$

Exit Survey

$x_1=0, x_2=1$
$x_1 = 0, x_2 = 1$ $z = 57.25$

$$x_1 = 2.25, x_2 = 1$$

 $z = 4308.203$

$$egin{array}{c} x_1 = 1, x_2 = 1 \ z = 156.25 \end{array}$$

$$m{x}_1 = 1, x_2 = 2.25 \ z = 0$$



Submit

You have used 1 of 2 attempts

✓ Correct (1/1 point)

PART B

1/1 point (graded)

Consider the NLP formulation below

• Decision variables: x_1, x_2, x_3

• Objective value: z

Formulation:

$$egin{array}{lll} \min & (2x_1+3x_2+4x_3)^2 \ \mathrm{s.t.} ; \ & (1) & 10x_1+11x_2+12x_3 \leq 60 \ & (2) & 21x_1+22x_2+23x_3 \leq 150 \ & (3) & 21x_1+22x_2-23x_3 \geq 110 \end{array}$$

$$(4) \quad 19x_1 + 34x_2 - 32x_3 = 180$$

(1) 1021 | 0122 0223

What is the (rounded) optimal solution?

$$egin{array}{ll} x_1=0, x_2=5.371, x_3=0.079 \ z=269.912 \end{array}$$

$$egin{array}{ll} x_1=0,x_2=0,x_3=0 \ z=0 \end{array}$$

$$egin{aligned} &x_1=5.294, x_2=0, x_3=0\ &z=112.106 \end{aligned}$$

$$x_1 = 0, x_2 = 5.294, x_3 = 0$$

 $z = 252.249$

$$egin{array}{ll} x_1=-\infty, x_2=0, x_3=0 \ z=-\infty \end{array}$$



Submit

You have used 1 of 2 attempts

✓ Correct (1/1 point)

PART C

1/1 point (graded)

Consider the maximization of the same NLP formulation

• Decision variables: x_1, x_2, x_3

• Objective value: z

Formulation:

$$\max \qquad (2x_1 + 3x_2 + 4x_3)^2$$

s.t.:

$$(1) \quad 10x_1 + 11x_2 + 12x_3 \le 60$$

$$(2) \quad 21x_1 + 22x_2 + 23x_3 \le 150$$

$$(3) \quad 21x_1 + 22x_2 - 23x_3 \geq 110$$

$$(4) \quad 19x_1 + 34x_2 - 32x_3 = 180$$

What is the rounded optimal solution?

$$x_1 = 0, x_2 = 5.368, x_3 = 0.079$$

 $x_1 = 269.651$

$$egin{array}{ll} x_1=0.079, x_2=0, x_3=0 \ z=0.025 \end{array}$$

$$egin{array}{c} x_1=0, x_2=5.368, x_3=0 \ z=259.339 \end{array}$$

$$egin{array}{ll} x_1=0,x_2=5.294,x_3=-\infty \ z=\infty \end{array}$$

$$egin{array}{ll} x_1=-\infty, x_2=0, x_3=0 \ z=\infty \end{array}$$



Submit You have used 1 of 2 attempts

✓ Correct (1/1 point)

© All Rights Reserved



© 2016 edX Inc. All rights reserved except where noted. EdX, Open edX and the edX and Open EdX logos are registered trademarks or trademarks of edX Inc.















