COURSera (/)

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return_to=https://learner.coursera.help/hc)
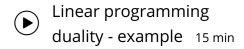
Linear Programming Duality

Claire Mathieu

This module does not study any
specific combinatorial optimization
problem. Instead, it introduces a

Duality by example

▶ Linear programming
duality - example 15 min
(/learn/approximation-algorithms-part-
2/lecture/LRNI1/linear-programming-duality-
example)

📰 Slides
(/learn/approximation-algorithms-part-
2/supplement/PXuBZ/slides)

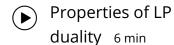⭐ **Practice Quiz:** Quiz
1 3 questions
(/learn/approximation-algorithms-part-
2/quiz/DDGe6/quiz-1)

⬤ Comment
(/learn/approximation-algorithms-part-
2/supplement/S7JWC/comment)

Properties of LP duality

Help Center

▶ Properties of LP
duality 6 min

(/learn/approximation-algorithms-part-
2/lecture/iBEE3/properties-of-lp-duality)

📰 Slides

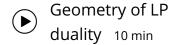(/learn/approximation-algorithms-part-
2/supplement/J1sBn/slides)

⭐ **Practice Quiz:** Quiz
2 1 question

(/learn/approximation-algorithms-part-
2/quiz/YkTK2/quiz-2)

Geometry of LP duality

▶ Geometry of LP
duality 10 min

(/learn/approximation-algorithms-part-
2/lecture/Zjfj2/geometry-of-lp-duality)

📰 Slides

(/learn/approximation-algorithms-part-
2/supplement/Pkowv/slides)

⭐ **Practice Quiz:** Quiz
3 1 question

(/learn/approximation-algorithms-part-
2/quiz/ICHlA/quiz-3)

Proof of weak duality

● Slides

(/learn/approximation-algorithms-part-
2/supplement/sdmjG/slides)

⭐ **Practice Quiz:** Quiz
4 2 questions

(/learn/approximation-algorithms-part-

2/quiz/70MF0/quiz-4)

(▶) Proof of weak duality
theorem 6 min

(/learn/approximation-algorithms-part-
2/lecture/eAkFN/proof-of-weak-duality-
theorem)

Changing the form of the LP

● Slides

(/learn/approximation-algorithms-part-
2/supplement/yfCJ4/slides)

(★) **Practice Quiz:** Quiz
5   2 questions

(/learn/approximation-algorithms-part-
2/quiz/sA6jz/quiz-5)

(▶) Changing the form of the
LP   11 min

(/learn/approximation-algorithms-part-
2/lecture/aOduN/changing-the-form-of-the-
lp)

Complementary slackness

● Slides

(/learn/approximation-algorithms-part-
2/supplement/eChz5/slides)

(▶) Complementary
slackness   6 min

(/learn/approximation-algorithms-part-
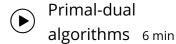2/lecture/MQwHy/complementary-slackness)

(★) **Practice Quiz:** Quiz
6   2 questions

(/learn/approximation-algorithms-part-

2/quiz/R546U/quiz-6)

Primal-dual algorithms

▶ Primal-dual
algorithms   6 min

(/learn/approximation-algorithms-part-
2/lecture/ngYhy/primal-dual-algorithms)

📄 Slides

(/learn/approximation-algorithms-part-
2/supplement/jvd6c/slides)

⭐ **Practice Quiz:** Quiz
7   1 question

(/learn/approximation-algorithms-part-
2/quiz/O2HH5/quiz-7)

Vertex Cover by primal-dual

⬤ Slides

(/learn/approximation-algorithms-part-
2/supplement/RoztM/slides)

⭐ **Practice Quiz:** Quiz
8   2 questions

(/learn/approximation-algorithms-part-
2/quiz/Rd4oz/quiz-8)

▶ Vertex cover by primal-
dual   23 min

(/learn/approximation-algorithms-part-
2/lecture/srRzu/vertex-cover-by-primal-dual)

Conclusion

⬤ Slides

(/learn/approximation-algorithms-part-

2/supplement/z3Rn1/slides)

(▶) Conclusion 4 min

(/learn/approximation-algorithms-part-
2/lecture/4SmUL/conclusion)

Exercises

● Slides-all

(/learn/approximation-algorithms-part-
2/supplement/DKTvy/slides-all)

✓ **Assignment:** Assignment
1 30 min

(/learn/approximation-algorithms-part-
2/peer/QHUvH/assignment-1)