# coursera (/)

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Congratulations! You have completed Week 4.

# Maximum Cut and Semi-Definite Programming



Claire Mathieu

We introduce a generalization of linear programming, semi-definite programming. This module uses

### Definition



Definition 5 min

(/learn/approximation-algorithms-part-2/lecture/NoTze/definition)



Slides

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



Practice Quiz: Quiz

1 2 questions

(/learn/approximation-algorithms-part-2/quiz/pM2Yj/quiz-1)

# A 2-approximation



A 2-approximation 5 min

Help Center

(/learn/approximation-algorithms-part-2/lecture/831Wi/a-2-approximation)



Slides

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



Practice Quiz: Quiz

2 questions

(/learn/approximation-algorithms-part-2/quiz/hfbW3/quiz-2)

A linear programming relaxation...



A linear programming relaxation... 12 min

(/learn/approximation-algorithms-part-2/lecture/81lT6/a-linear-programmingrelaxation)



Slides

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



Practice Quiz: Quiz

3 1 question

(/learn/approximation-algorithms-part-2/quiz/leZb2/quiz-3)

... that has an integrality gap of almost 2 (overview)



Slides

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



Practice Quiz: Quiz

4 1 question

(/learn/approximation-algorithms-part-2/quiz/XXh2E/quiz-4)



...with an integrality gap of almost 2 11 min

(/learn/approximation-algorithms-part-2/lecture/MBUms/with-an-integrality-gap-ofalmost-2)

### Proof of lemma



Slides

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



Practice Quiz: Quiz

5 2 questions

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



Proof of Lemma 7 min

(/learn/approximation-algorithms-part-2/lecture/6kB4O/proof-of-lemma)

A quadratic programming relaxation



A quadratic (▶) programming relaxation 4 min

(/learn/approximation-algorithms-part-2/lecture/c0YHC/a-quadratic-programmingrelaxation)



Slides

(/learn/approximation-algorithms-part-2/supplement/ec4UP/slides)



Practice Quiz: Quiz

6 1 question

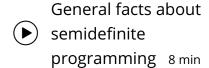
(/learn/approximation-algorithms-part-2/quiz/uj0GZ/quiz-6)

# General facts about semidefinite programming



Slides

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



(/learn/approximation-algorithms-part-2/lecture/wbwin/general-facts-aboutsemidefinite-programming)



Practice Quiz: Quiz

7 1 question

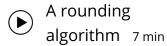
(/learn/approximation-algorithms-part-2/quiz/7xhwj/quiz-7)

## A rounding algorithm



Slides

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



(/learn/approximation-algorithms-part-2/lecture/9RV0B/a-rounding-algorithm)



Practice Quiz: Quiz

8 1 question

(/learn/approximation-algorithms-part-2/quiz/5AljD/quiz-8)

### **Analysis**



**Sldies** 

(/learn/approximation-algorithms-part-2/supplement/U49IK/sldies)



Analysis 6 min

(/learn/approximation-algorithms-part-2/lecture/Dmv4R/analysis)

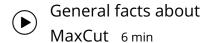


Practice Quiz: Quiz

9 1 question

(/learn/approximation-algorithms-part-2/quiz/SOGgh/quiz-9)

#### General facts about Maxcut



(/learn/approximation-algorithms-part-2/lecture/NobQV/general-facts-aboutmaxcut)



Slides

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

### Exercises



Slides-all

(/learn/approximation-algorithms-part-2/supplement/6OyVP/slides-all)



**Assignment:** Assignment

4 30 min

(/learn/approximation-algorithms-part-2/peer/E03rO/assignment-4)



The end! 4 min

(/learn/approximation-algorithms-part-

2/lecture/q9Eog/the-end)



Comment

(/learn/approximation-algorithms-part-2/supplement/WtJCY/comment)