

# "Team grading in the active learning"

Kwansei Gakuin Univ., Shigeto R. Nishitani

- 2012 RIMS "After story of Luffy's team(Maple edition)"
  - Pair tasks
    - on the education on the equation manipulation software-
  - students' self-selected pair(friend)
  - "Pair exam": work together on the questions, and submits one solution, and given the same grade
  - "Pair grading": individual exam. but receive one grade of the average of individual scores.

# comparison against TBL

	team grading	team based learning
team formation	student-selected	never use student-selected
task, assignment	traditional	special
scoring	traditional (less)	+team skills
grading	traditional	peer evaluation
	behaviorist	cognitive model

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# "Team grading in the active learning"

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- 2012 RIMS "After story of Luffy's team(Maple edition)"
  - Pair works and its effect on the education on the equation manipulation software-
  - from "Pair exam" to "Pair grading" of student-selected pair, grade them as the average of individual scores.
- Difficulties in this year
- Change the group forming and incentives
- Comparison against Team Based Learning(TBL)
- Other trials

以下の問題を Maple を用いて自力で解き，出力して提出せよ．何番をやっているかが分かるようにせよ．1，2は資料を参考にせよ．60点以下のグループは解体．

1. (a) 次の二重積分を求めよ．(10点)

$$\iint \frac{x}{x^2 + y^2} dx dy, D : x^2 + y^2 \leq x$$

- (b) 曲線  $y = \frac{1}{x^2 + 1}$  と放物線  $x^2 = 2y$  によって囲まれた部分の面積を求めよ．(15点)

2. (a) つぎの行列  $A = \begin{bmatrix} 5 & -7 & -7 \\ -4 & 8 & 7 \\ 4 & -10 & -9 \end{bmatrix}$  が対角化可能ならば変換の行列を求めて対角化せよ．(10点)

- (b) タブレット型端末4種 (iP, And, Nex, Sur) のそれぞれの市場占有率 (シェア, %)

$$\text{が } [60, 40, 0, 0] \text{ であるとする．次の推移確率行列 } Q = \begin{pmatrix} 0.6 & 0.2 & 0.2 & 0.2 \\ 0.2 & 0.6 & 0.2 & 0.1 \\ 0.1 & 0.1 & 0.5 & 0.2 \\ 0.1 & 0.1 & 0.1 & 0.5 \end{pmatrix}$$

に従って毎年のシェアが推移すると仮定すると，次年度のシェアはどうか？ また，10年後ではどうか？(15点)

3.  $a, b, c$  を定数とし， $a > 0$  とする． $x$  の2次関数

$$y = ax^2 + bx + c$$



が  $[60, 40, 0, 0]$  であるとする. 次の推移確率行列  $Q =$

0.2	0.6	0.2	0.1
0.1	0.1	0.5	0.2
0.1	0.1	0.1	0.5

に従って毎年のシェアが推移すると仮定すると, 次年度のシェアはどうか? また, 10年後ではどうか? (15点)

3.  $a, b, c$  を定数とし,  $a > 0$  とする.  $x$  の2次関数

$$y = ax^2 + bx + c$$

のグラフを  $G$  とし, グラフ  $G$  は  $x$  軸より上側にあるものとする.

(a)  $x$  軸上に3点

$$P_1(2, 0), P_2(4, 0), P_3(6, 0)$$

をとり, グラフ  $G$  上に3点  $Q_1, Q_2, Q_3$  を

$Q_1$  の  $x$  座標は2,  $Q_2$  の  $x$  座標は4,  $Q_3$  の  $x$  座標は6

であるようにとる.

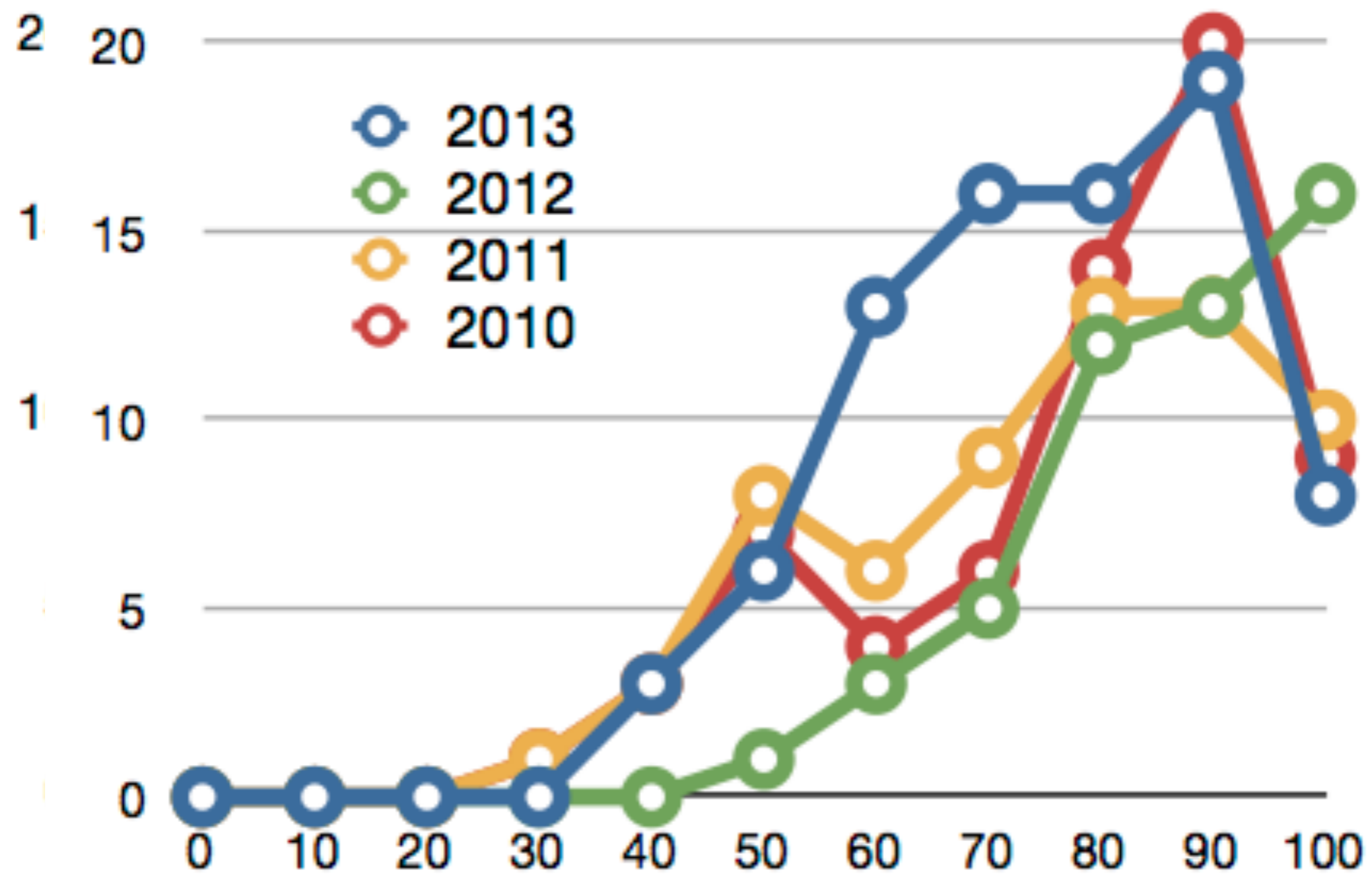
台形  $P_1 P_2 Q_2 Q_1$  の面積を  $S_1$ , 台形  $P_1 P_3 Q_3 Q_1$  の面積を  $S_2$  とするとき

$$S_1 = 2 \left( \boxed{\text{アイ}} a + \boxed{\text{ウ}} b + c \right)$$

$$S_2 = 4 \left( \boxed{\text{エオ}} a + \boxed{\text{カ}} b + c \right)$$

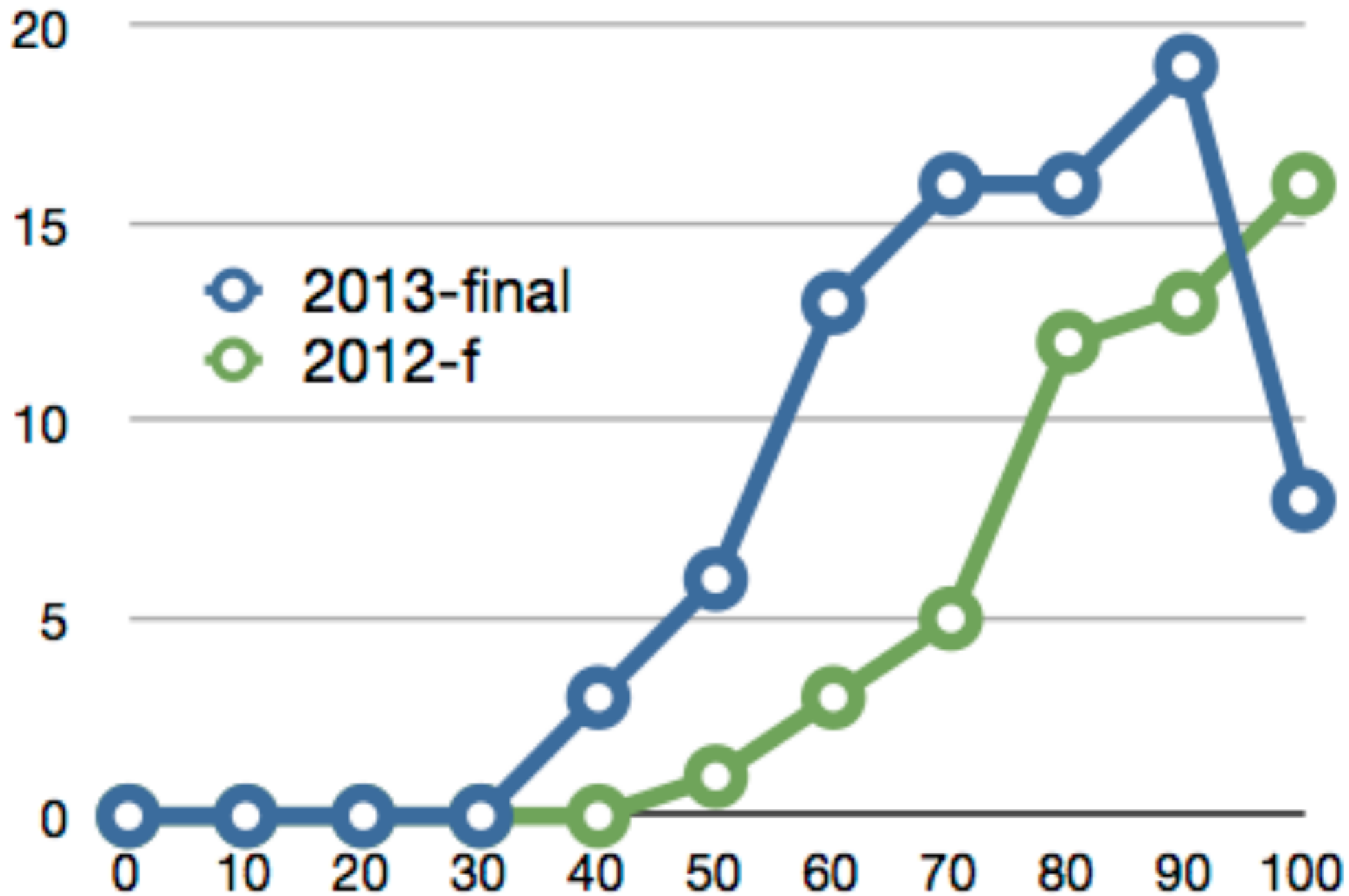
である.

# Final exam score on each year





# Final exam score on each year





# Exercise on Maple(junior, spring,

- students in Informatics 1.5hour/w ex.)
  - calculus, Linear Algebra
  - equation manipulations
- strong apathy
- poor engagement
- poor ability for problem solving.
- poor experience on exercises (in high school days).

# Struggling for exercise styles...

- ~2010: four men cell, pair, peer evaluation...

- 2011: student-selected pair

- pair exam.

- incentive: pair separation

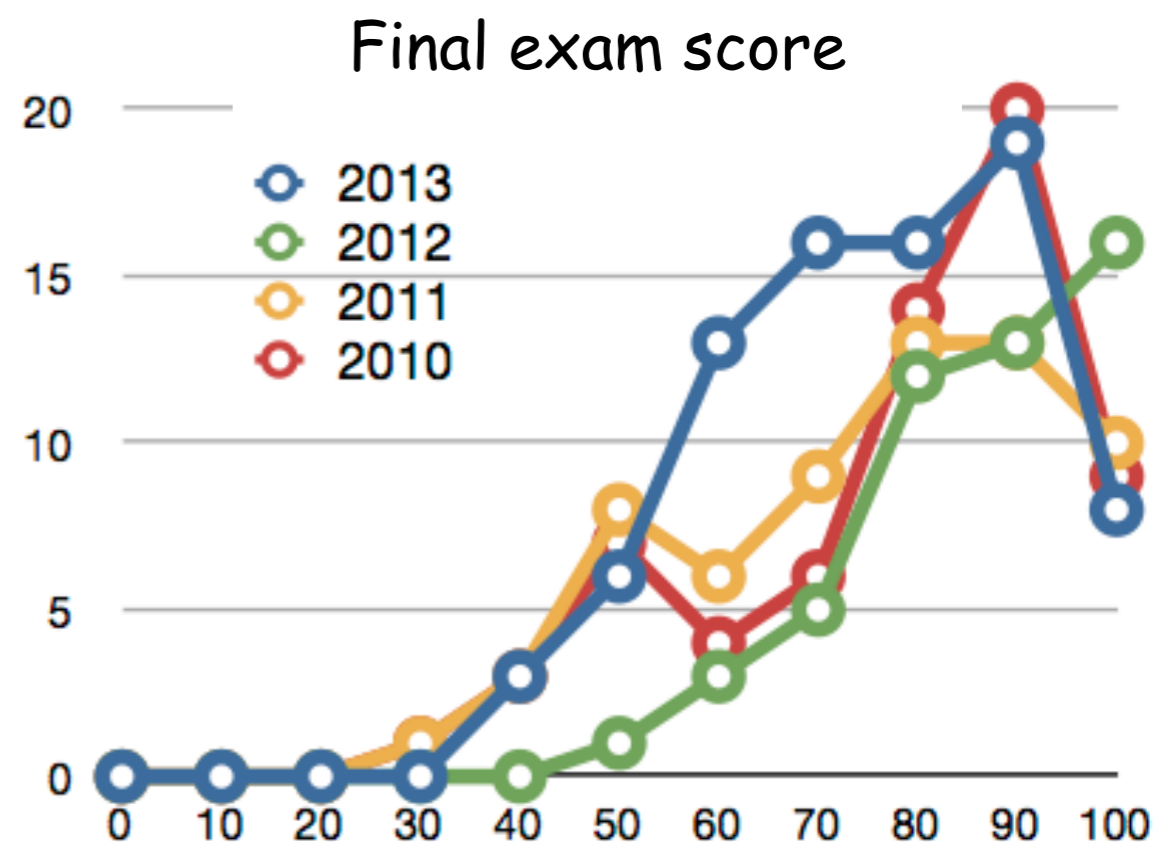
- still many free riders

- 2012: student-selected pair

- pair exam.

- pair grading: grade them as an average of individual scores.

- 2013...

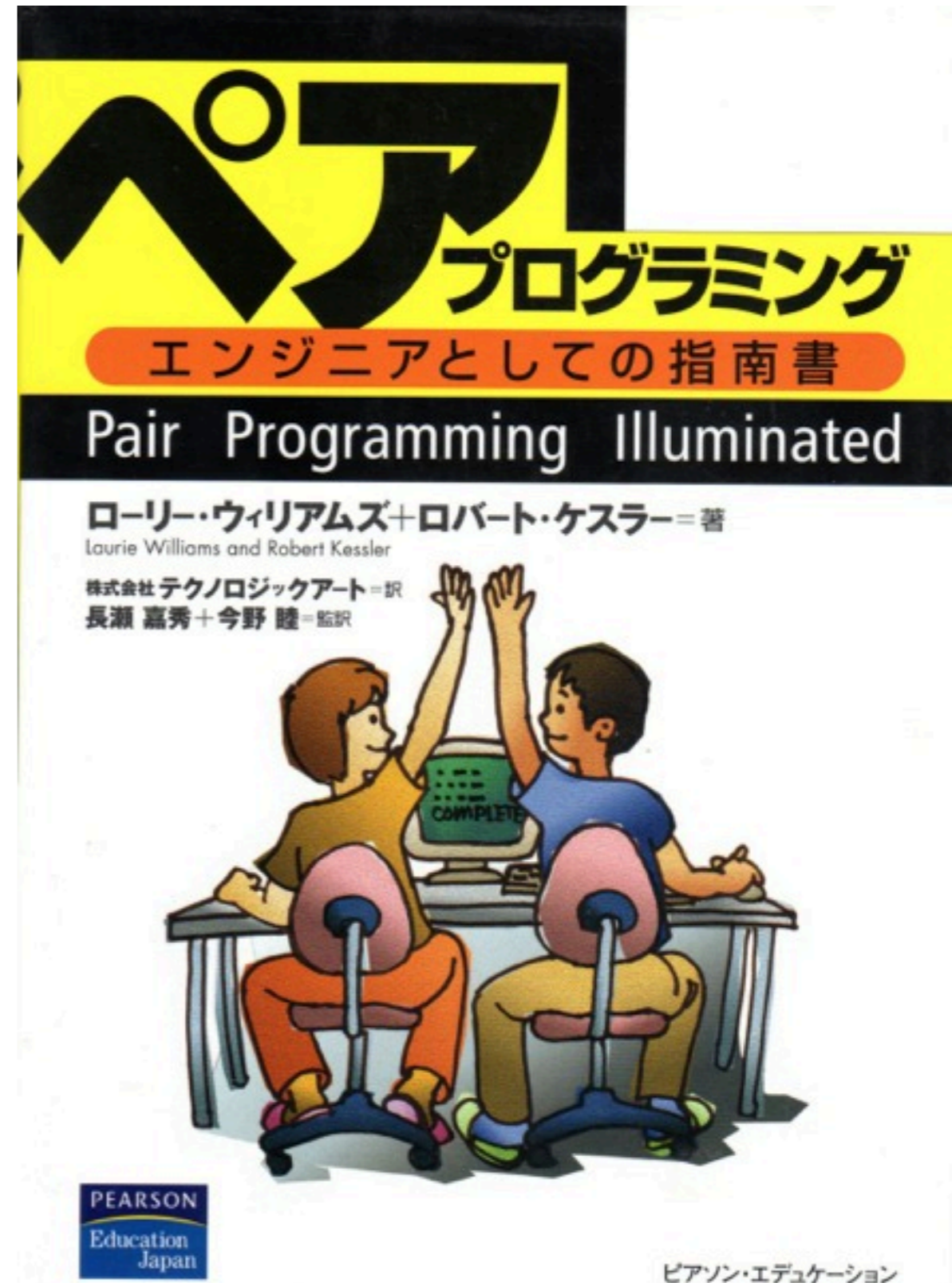


# Maple course work

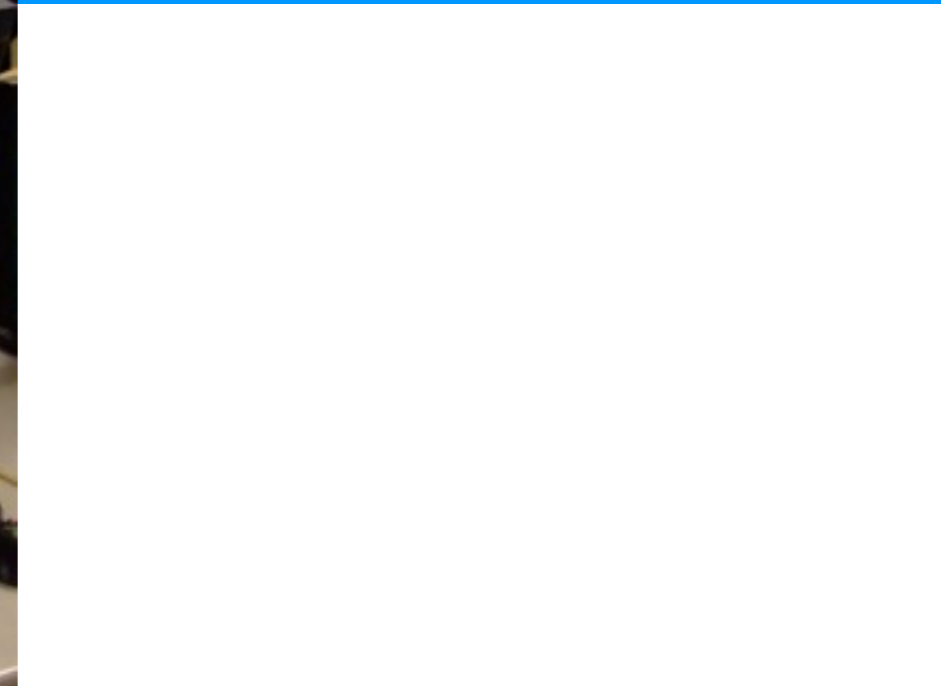
- Student-selected pair
- Preclass home works for Maple commands.
- Pair tasks during the class
- ...
- Pair Exam(mid term)
- Low score pairs...
- ...
- Individual Exam(final)
- Grade them as an average of individual scores.

# Pair work

- Agile programming, Extreme...
  - programming technique
  - against Programming alone
- How to?
  - Pair work like a cake cut in a wedding ceremony.
  - Share one PC, one Monitor, one Keyboard, one Mouse.
  - a Driver and a Navigator,
  - Turn in 5min, tired, uncertain...
  - funny man(Boke) and straight man(Zukkomi) in Manzai.









# ペアプロ

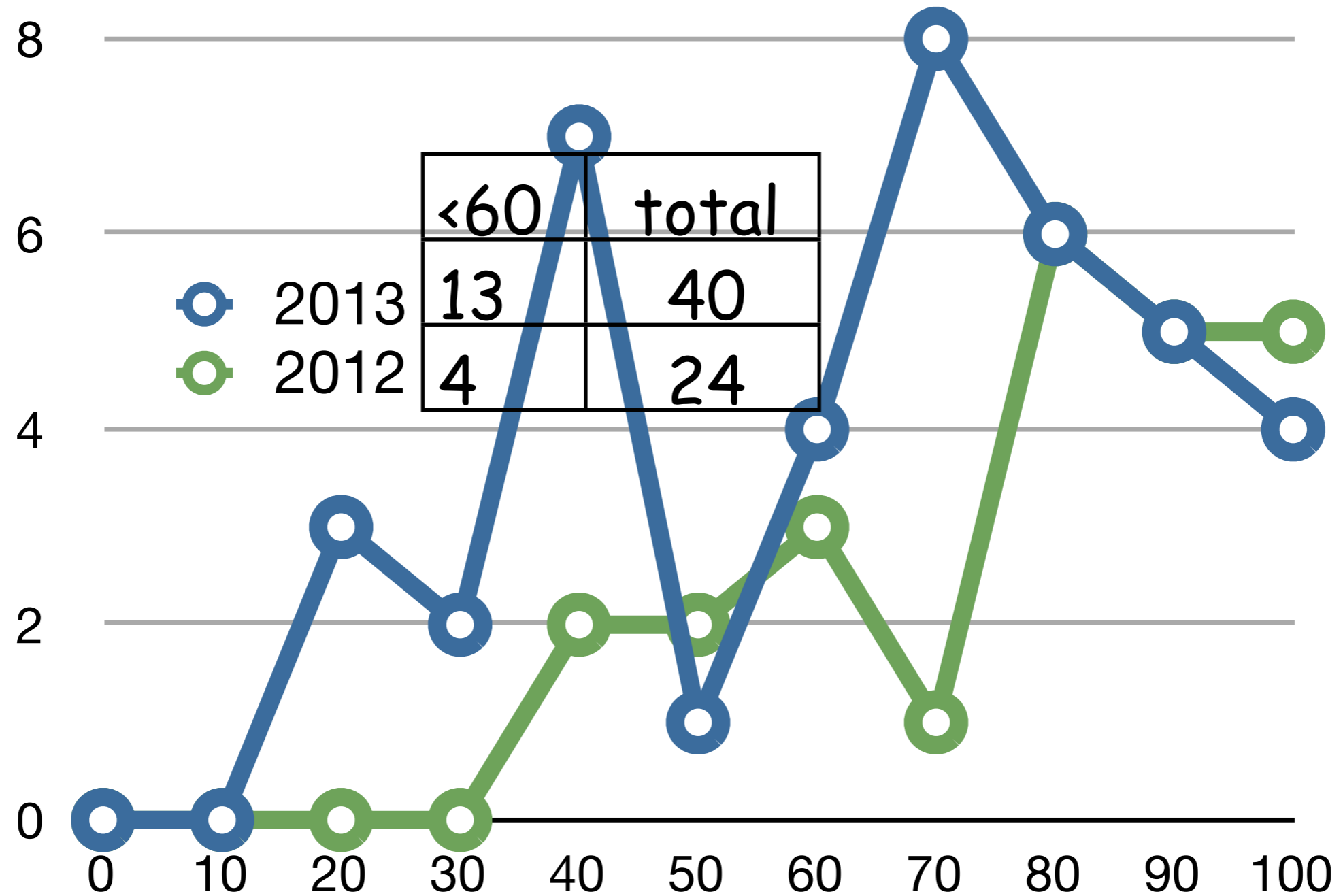


# Generation "One Piece"

- Generation "One Piece"=team base
  - Treasure hunting, and heart warming story.
  - Your treasure or cherish, is the friendship.
  - Friendship is the most important in life.
- Generation "Gundam"=company base
- 『「ワンピース世代」の反乱, 「ガンダム世代」の憂鬱』, 鈴木貴博著, (朝日新聞出版, 2011/6)



# Pair examinations

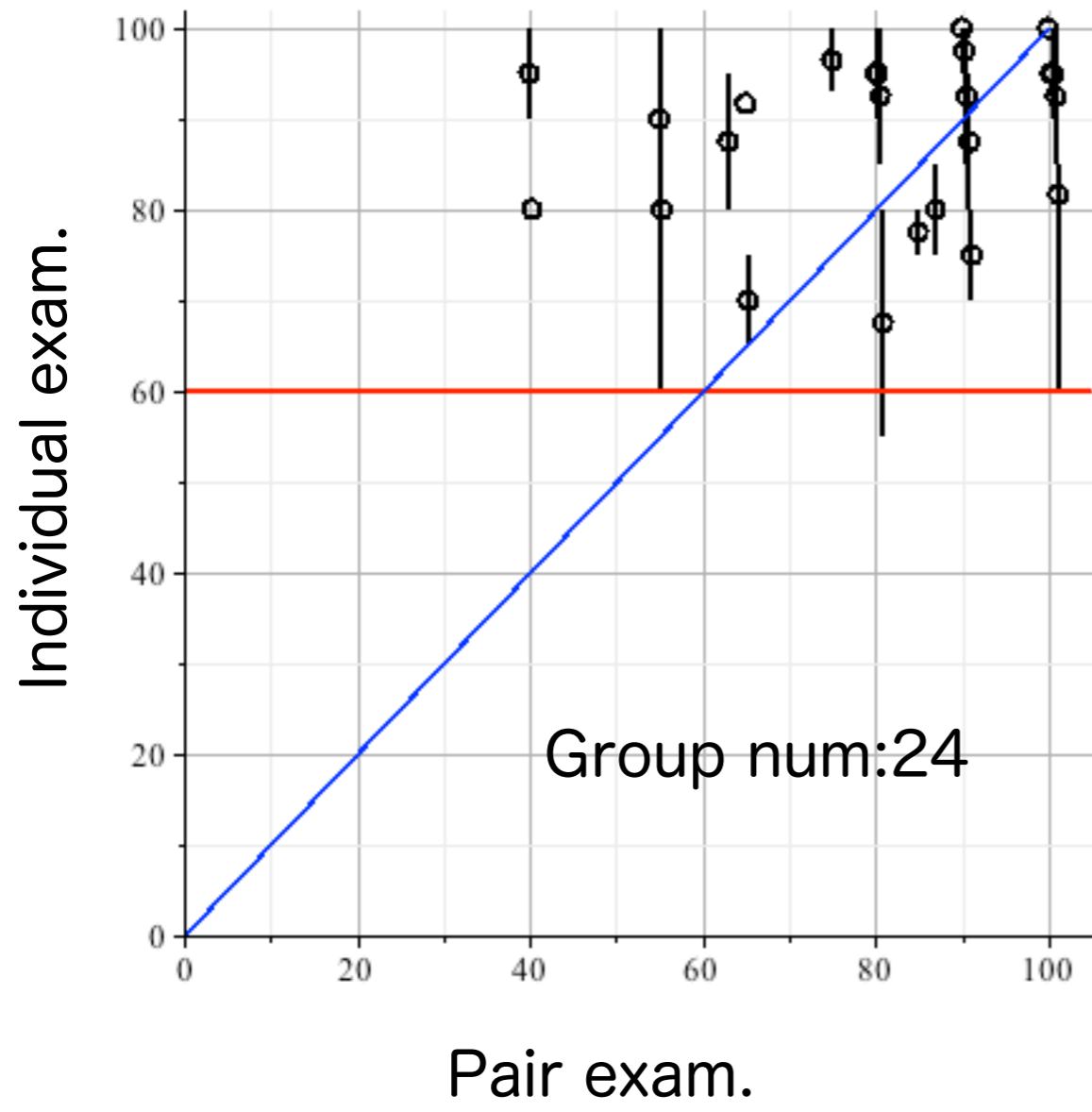


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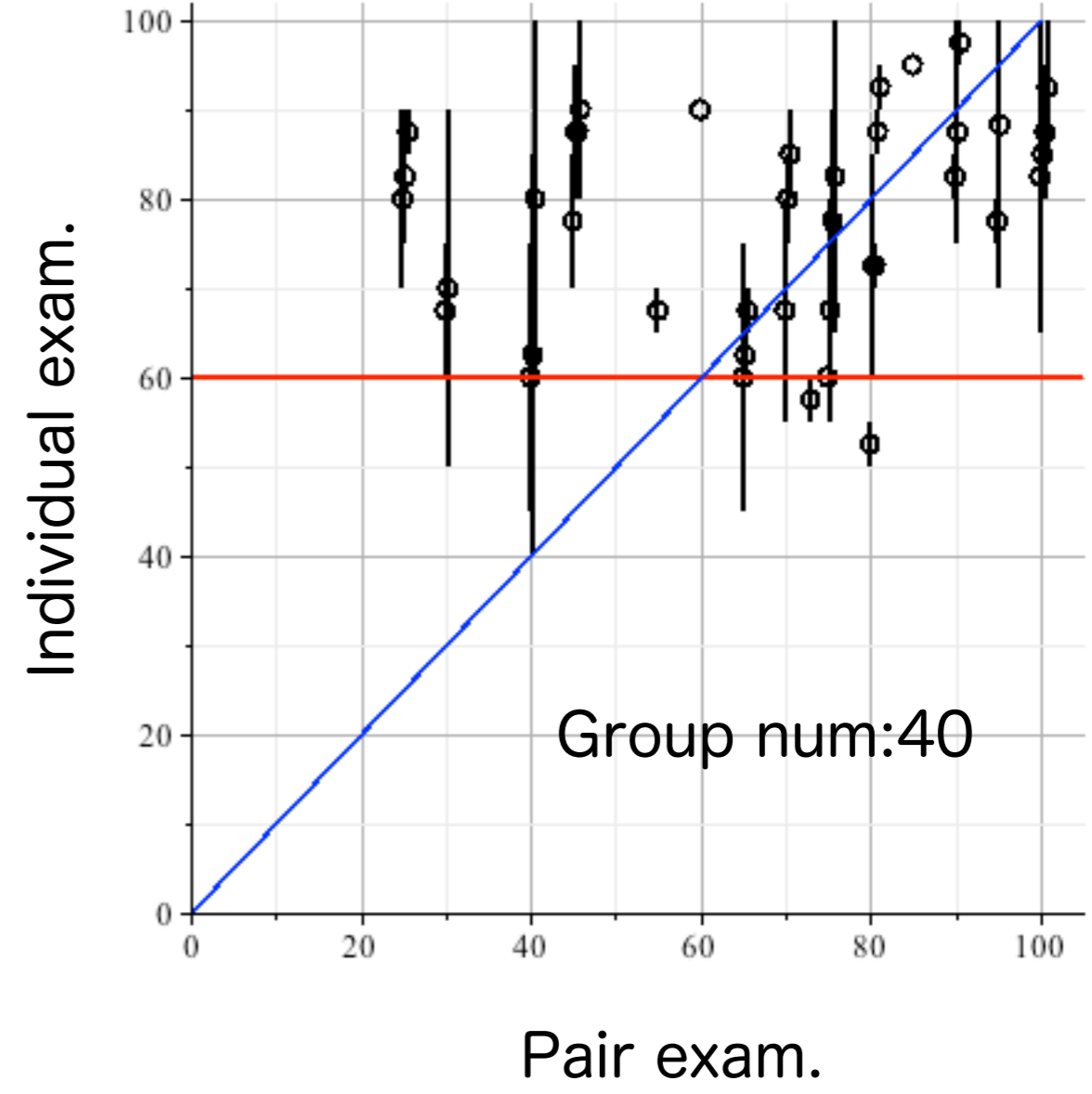
- "Pair exam": work together on the questions, and submits one solution, and given the same grade
- "Pair grading": individual exam. but receive one grade of the average of individual scores.
- an honor pair will be a tutor for a less able pair.
  - incentive
  - bonus points are awarded to the honor pair on the scores improved by the less able pair.

# Correlation between Pair-Individual exams

2012S

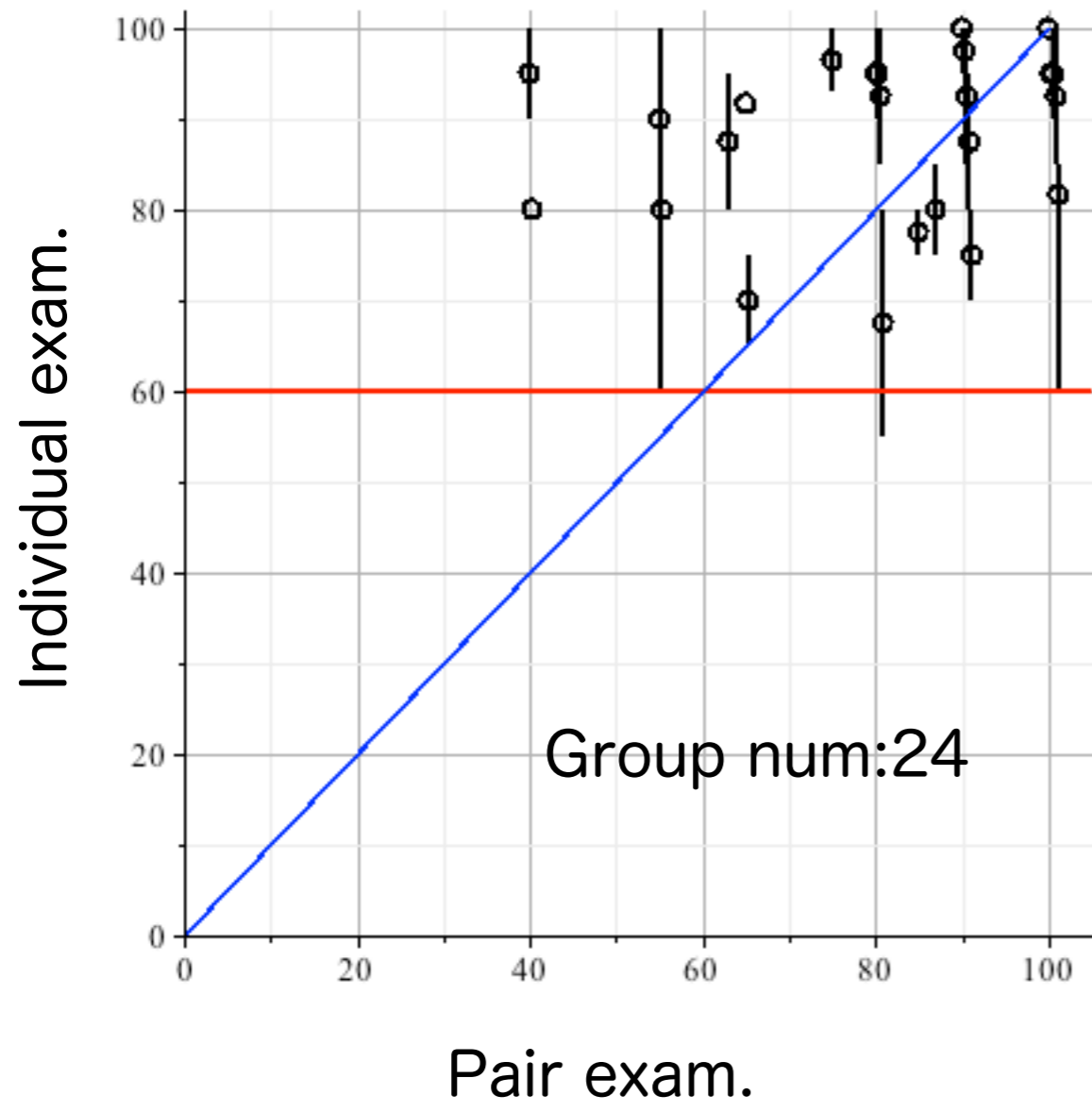


2013S

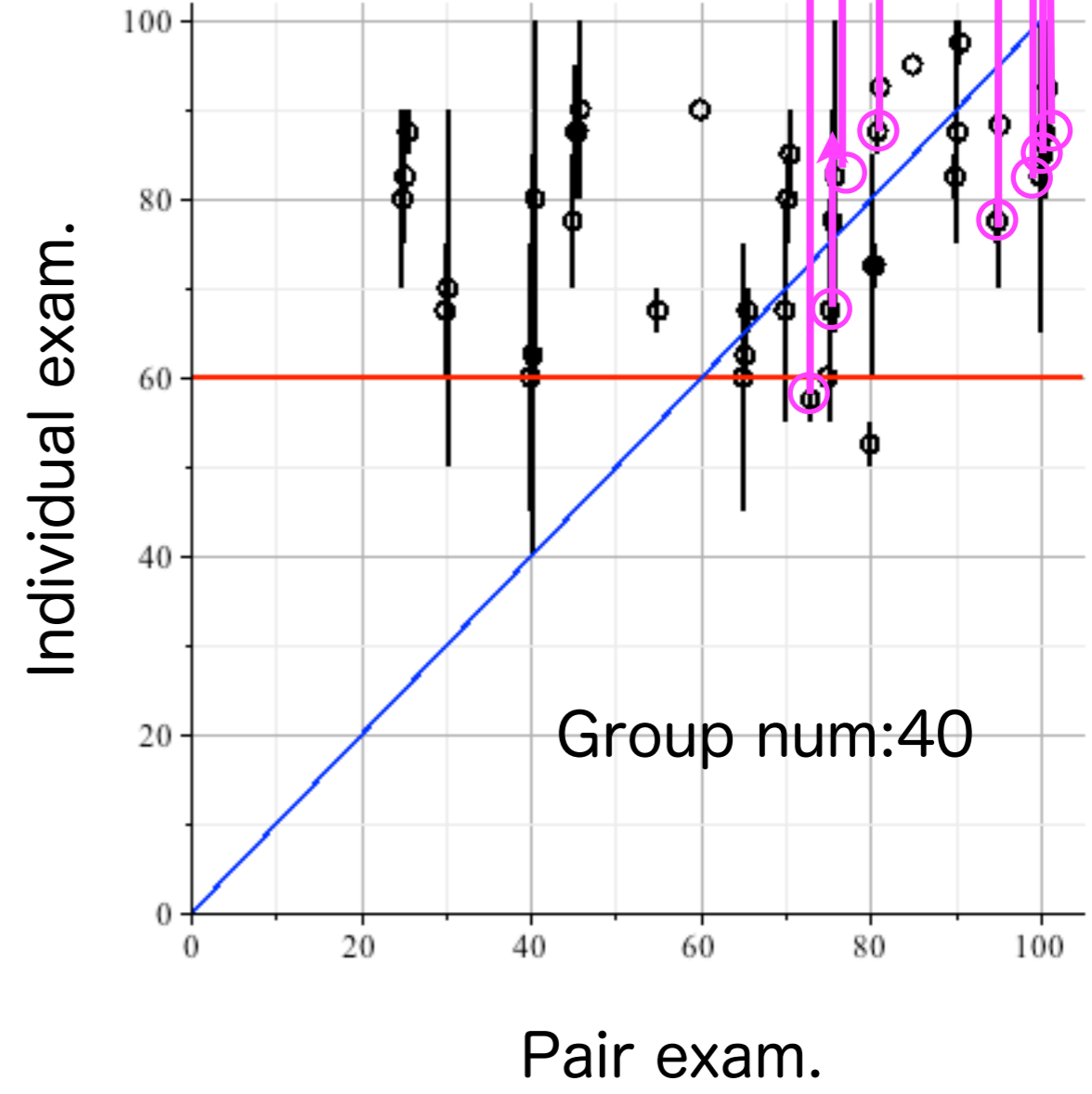


# Correlation between Pair-Individual exams

2012S



2013S



# Cons for Pair Gradings

- Group grades create opportunities for “easy riders” to avoid responsibility.
- Assigning group grades to individuals is unfair and unwise
  - students may be penalized or rewarded by the performance of other students on their teams
  - group grades that partially reflect the ability of other students undermine the validity of report cards
  - students who are evaluated on forces beyond their control may be frustrated
  - undifferentiated group grades may be illegal
    - lawsuits have emerged when the grades of honor students were pulled down by less able teammates
- “Collaborative Learning Techniques”, Elizabeth Barkley et al, (Jossey-Bass, 2004)

# Pros for Pair Gradings

- Individual score plus bonus points based on all members reaching criterion
- Individual score plus bonus points based on improvement scores
- Totaling members' individual scores
- Group score on a single product
- Individual academic scores plus bonus point based on performance of cooperative skills
- "Active Learning: Cooperation in the College Classroom", D. W. Johnson, R. T. Johnson, and K. A. Smith, (International Book Comp., Minnesota, 2006)

# comparison against TBL

	team grading	team based learning
team formation	student-selected	never use student-selected
task, assignment	traditional	special
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grading	traditional	peer evaluation
	behaviorist	cognitive model