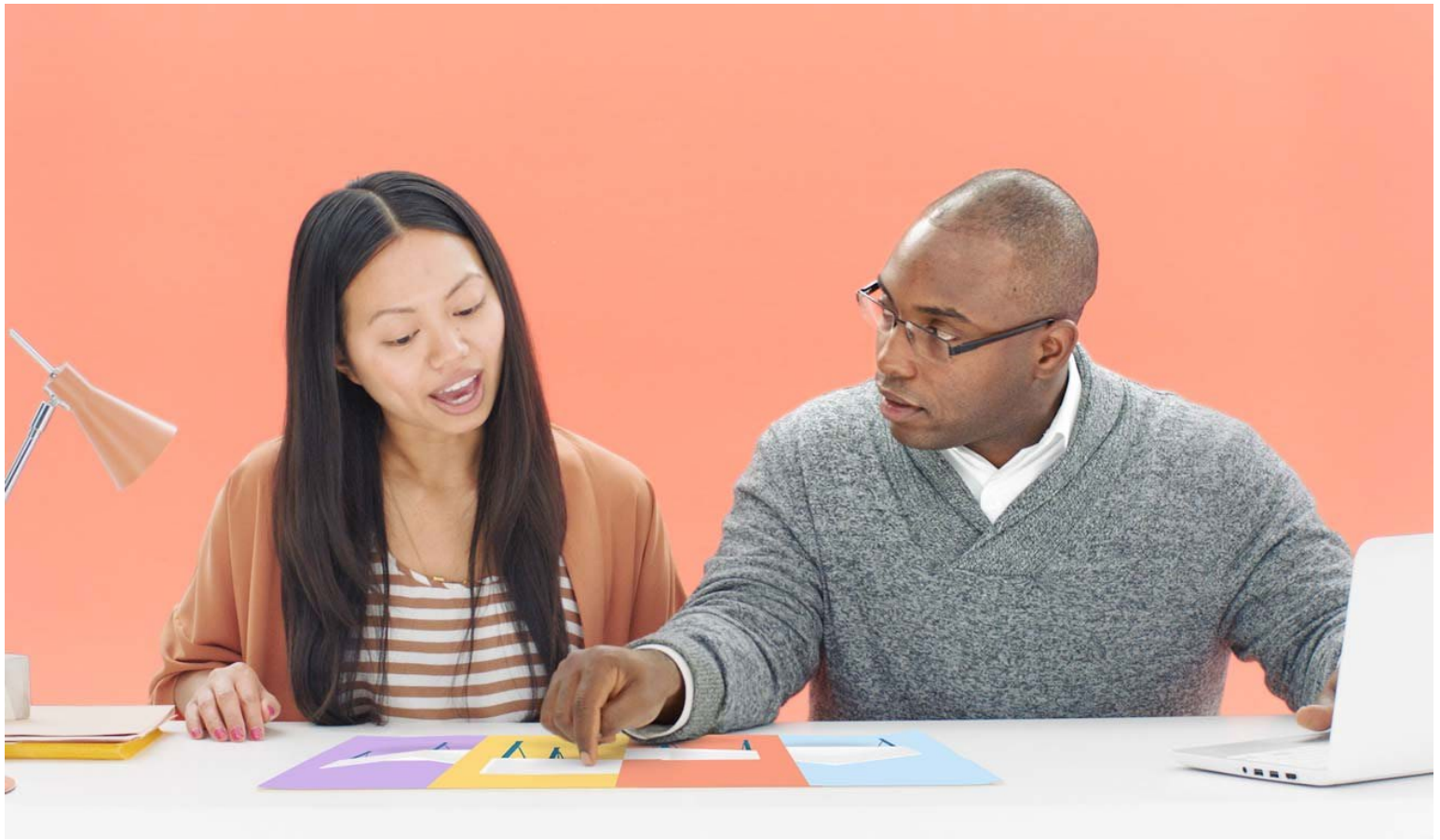
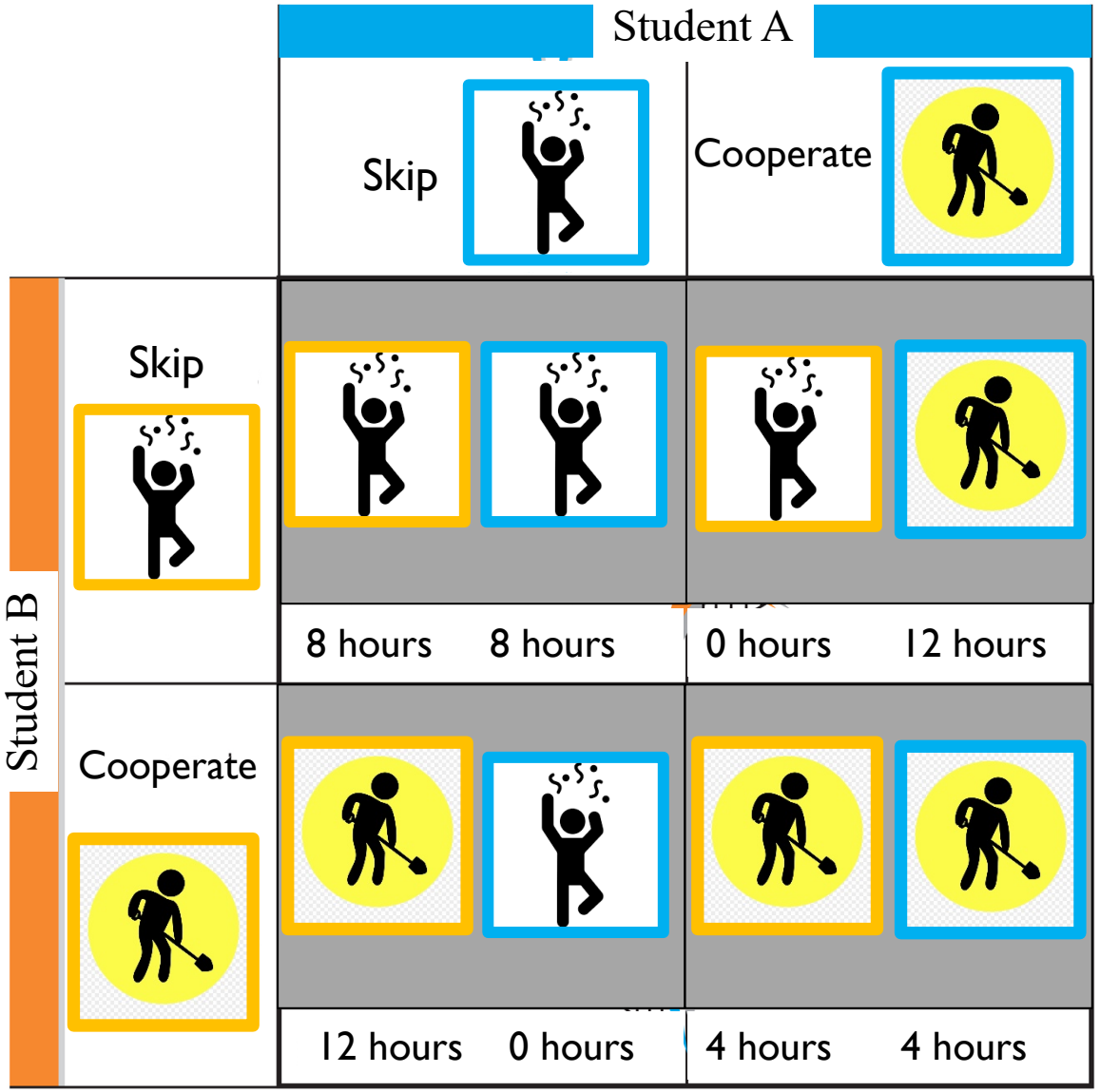
Game Theory: Partner Project



Game Theory: Partner Project

- You have been assigned a partner for a project
- The project must be completed to finish the course
- You have several difficult finals to study for in addition to working on this project
- Your goal is to minimize the amount of time you work on this project
- You have set up a meeting with your partner. You must decide to show up to work on the project or skip the meeting
- (Your grade on the project will not change based on what you do. Only the amount of time you spend will vary.)

Partner Project



The goal of an individual student is to minimize the amount of time they spend on the project

Can be considered in terms of adopting the strategy that maximizes fitness.

What is the best strategy?

What should students do in different Scenarios?

Partner Project lightning Round!

- You and your partner have scheduled a meeting to work on the project
- I will give you a small detail concerning your partner
- You must decide if you will attend the project meeting

- You can’t trust your fellow student. (there is a 75% chance they will skip the meeting).

- What will you do?
- A = Cooperate
- B = Skip

You can’t trust your partner

- (75% chance to be Betrayed)

  Calculate the average consequences of each possible decision.

If You Cooperate:

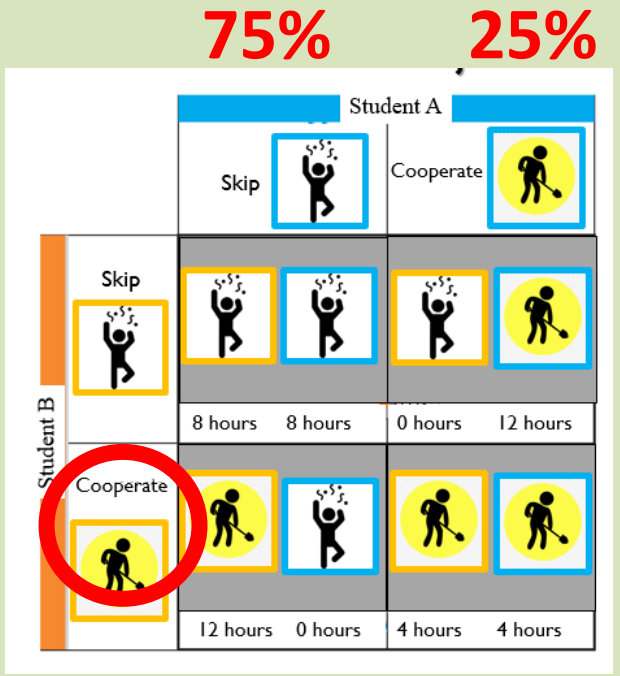
(75% chance partner skips * 12 hours) + (25% chance partner cooperates * 4 hours)

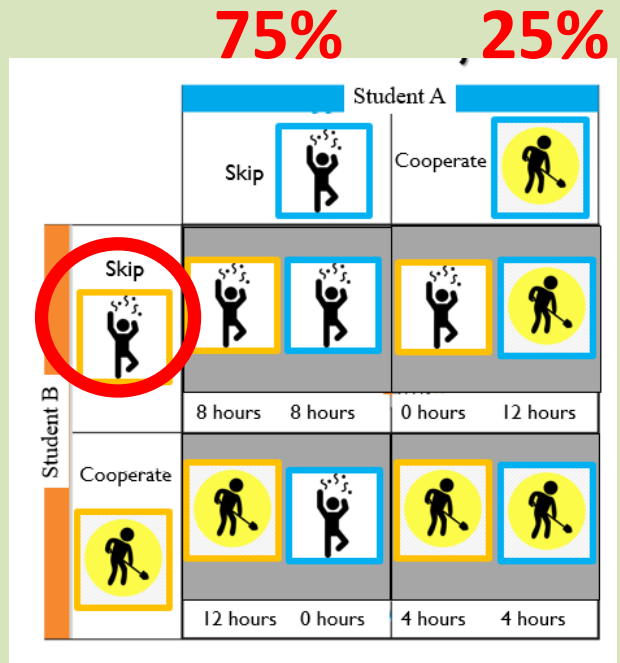
(.75 * 12)+(.25 * 4) = **10 hours**

If You Skip:

(75% chance partner skips * 8 hours) + (25% chance partner cooperates * 0 hours)

(.75 * 8)+(.25 * 0) = **6 hours**





- Your partner is a random person (there is a 50% chance they will skip the meeting).

- What will you do?
- A = Cooperate
- B = Skip

Your partner is a random person

- (50% chance to be Betrayed)

  Calculate the average consequences of each possible decision.

If You Cooperate:

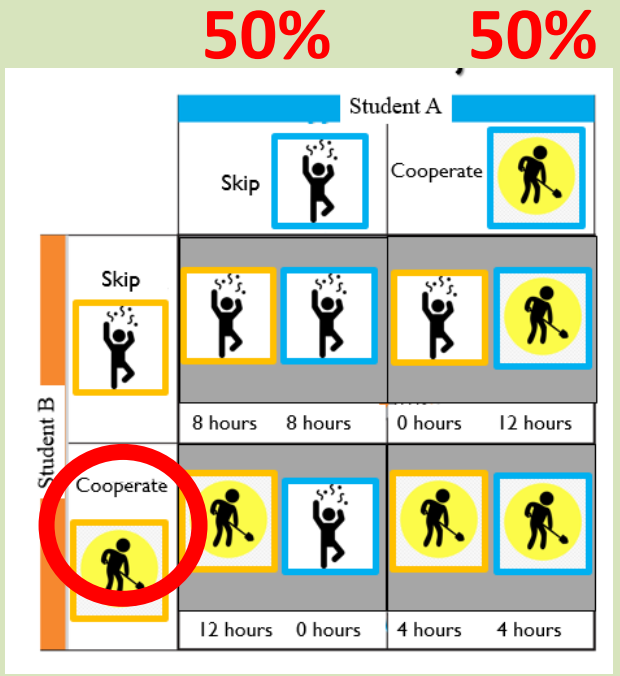
(50% chance partner skips * 12 hours) + (50% chance partner cooperates * 4 hours)

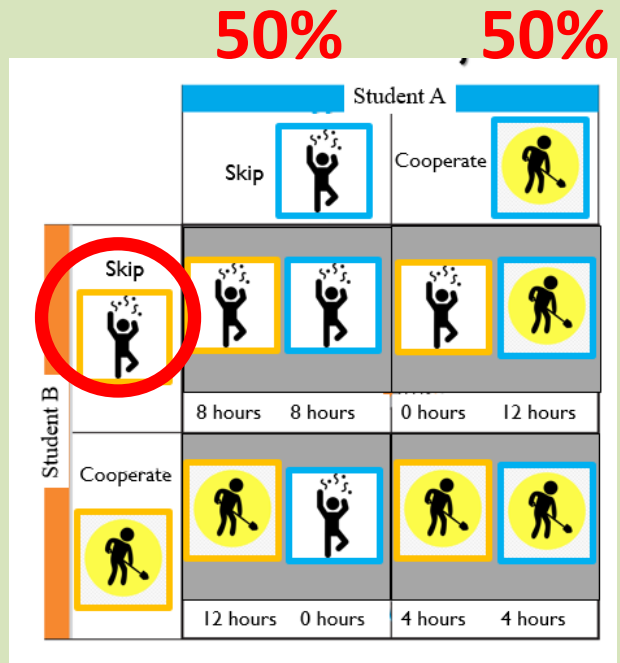
(.5 * 12)+(.5 * 4) = **8 hours**

If You Skip:

(50% chance partner skips * 8 hours) + (50% chance partner cooperates * 0 hours)

(.5 * 8)+(.5 * 0) = **4 hours**





- Your partner is your BFF there is only a 1% chance they will skip the meeting.

- What will you do?
- A = Cooperate
- B = Skip

Your partner is your BFF

- (1% chance to be Betrayed)

  Calculate the average consequences of each possible decision.

If You Cooperate:

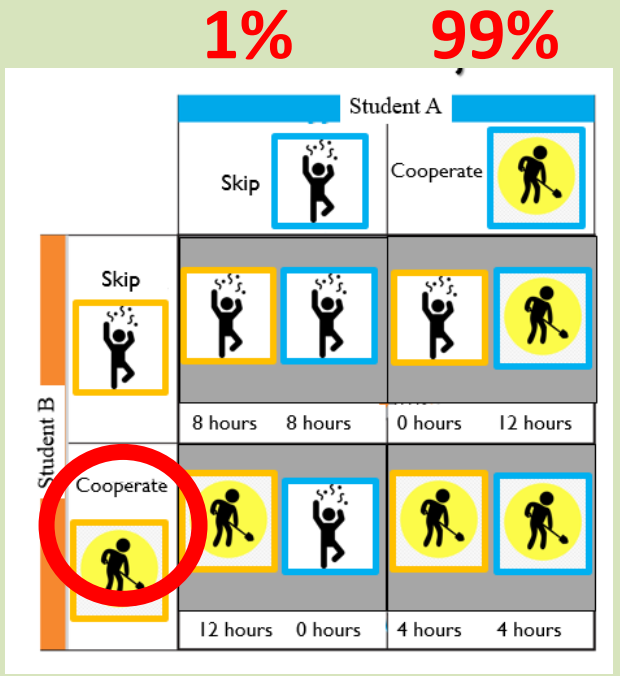
(1 % chance partner skips * 12 hours) + (99% chance partner cooperates * 4 hours)

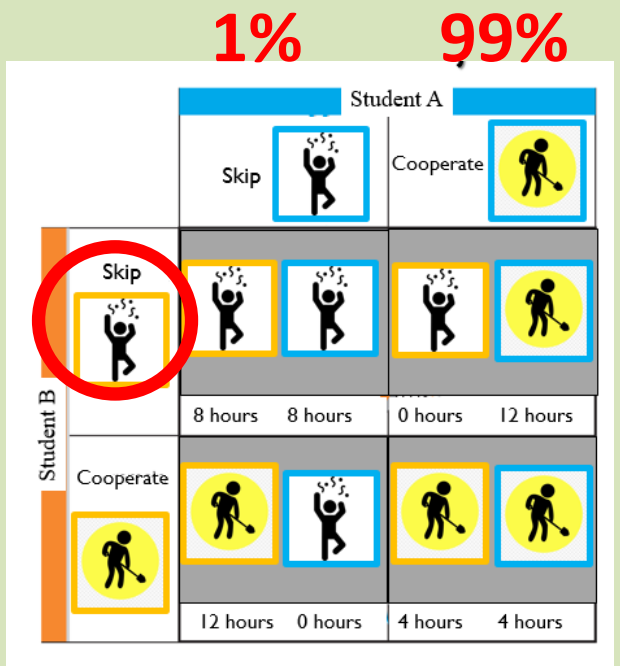
(.01 * 12)+(.99 * 4) = **4.08 hours**

If You Skip:

(1 % chance partner skips * 8 hours) + (99 % chance partner cooperates * 0 hours)

(.01 * 8)+(.99 * 0) = **0.08 hours**





Behavioral ecologists employ Game Theory and Evolutionarily Stable Strategies (ESS)

Evolutionarily Stable Strategy = behavioral strategy that is adopted by a population that cannot be invaded by another strategy

- All members of a population adopt the strategy
- No other strategy will yield a greater benefit to individuals over the long term

Skipping is the ESS

- Imagine a population where you will play “partner project” against a random opponent.
- The skipping strategy cannot be invaded.
  - Think of a population where everybody cooperates. Skipping provides a large advantage. A “skipper” spends zero time. Skipping would take over.
  - Think of a population where everybody skips. Cooperating does not give an advantage. Cooperating means you always spend 12 hours on the project. Everybody stays a “skipper”.
- The best solution is to skip.
- This is true even though, on average, if everybody cooperated there would be less total time on the project.

R