Assignment 5 / Solution

Non-cooperative game between an investor in a firm's shares and the firm's auditor (Scott, 7th Edition: page 353)

a. The Nash equilibrium is *do not invest, work for manager*. This is the only strategy pair such that, given the strategy choice of the other player, neither player has an incentive to change strategies.

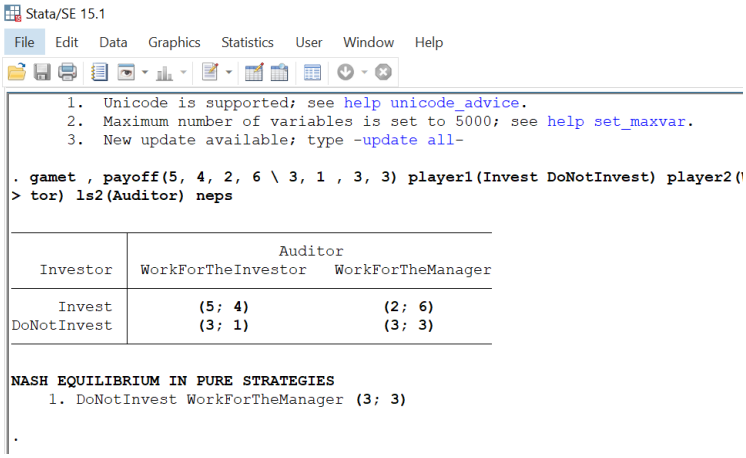
b. The cooperative solution is invest, work for investor. In this strategy, both players are better off than in the Nash equilibrium. The cooperative solution is unlikely in a single play because if the investor invests, the auditor will move to work for manager. Anticipating this strategy, the investor does not invest.

c. Three possible ways to attain the cooperative solution:

- The investor and auditor could enter into a binding agreement to play the cooperative strategy.
- Ethical behavior by the auditor, reinforced by the auditor's professional association and longer-run reputation considerations, may motivate the auditor to work for the investor despite the higher one-shot payoff of working for the manager.
- Change the payoffs of the game. For example, if the investor invests, a penalty of 4 for working for manager would lower the auditor's payoff to, say, 2. Then, the auditor would move to work for investor. Increased regulations following the Enron and WorldCom scandals, such as Sarbanes-Oxley, may have this effect.

Stata syntax (if you want to solve with a statistical software):

gamet , payoff(5, 4, 2, 6 \ 3, 1 , 3, 3) player1(Invest DoNotInvest) player2(WorkForTheInvestor WorkForTheManager) ls1(Investor) ls2(Auditor) neps



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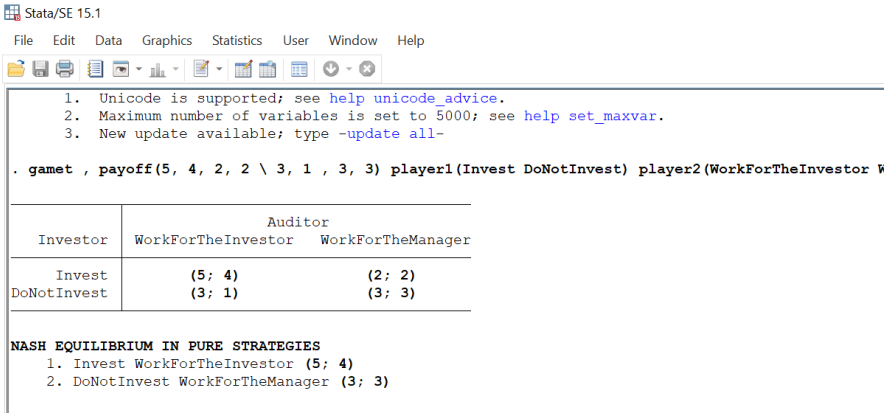

Changing the payoffs further, the only Nash equilibrium becomes: Invest,Work for the Investor

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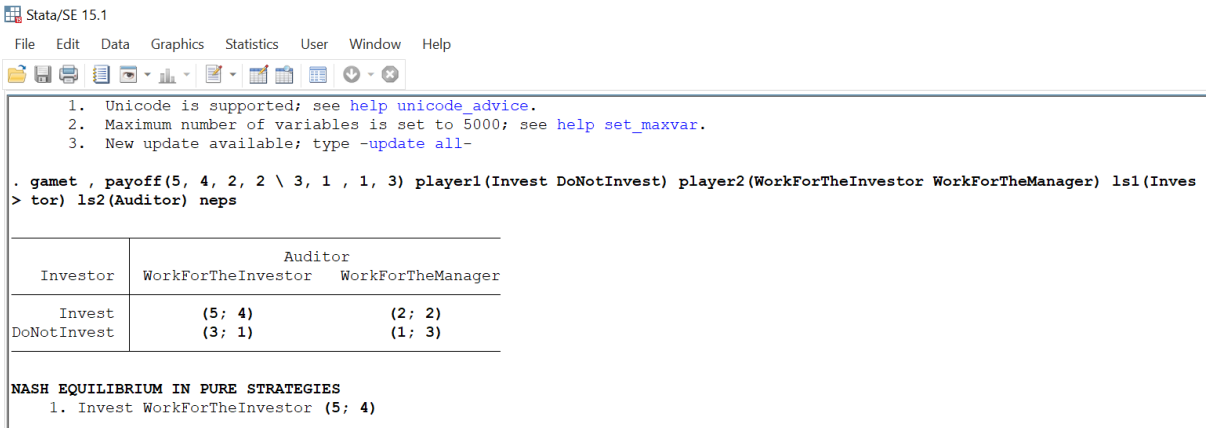

If you want to combine all reports and save those in a one sole MSword document:

asdoc gamet , payoff(5, 4, 2, 6 \ 3, 1 , 3, 3) player1(Invest DoNotInvest) player2(WorkForTheInvestor WorkForTheManager) ls1(Investor) ls2(Auditor) neps domist, title(The First Game) label font(Times New Roman) replace save(The Games) dec(1)

*change of payoffs

asdoc gamet , payoff(5, 4, 2, 2 \ 3, 1 , 3, 3) player1(Invest DoNotInvest) player2(WorkForTheInvestor WorkForTheManager) ls1(Investor) ls2(Auditor) neps domist, title(The Second Game) label font(Times New Roman) append save(The Games) dec(1)

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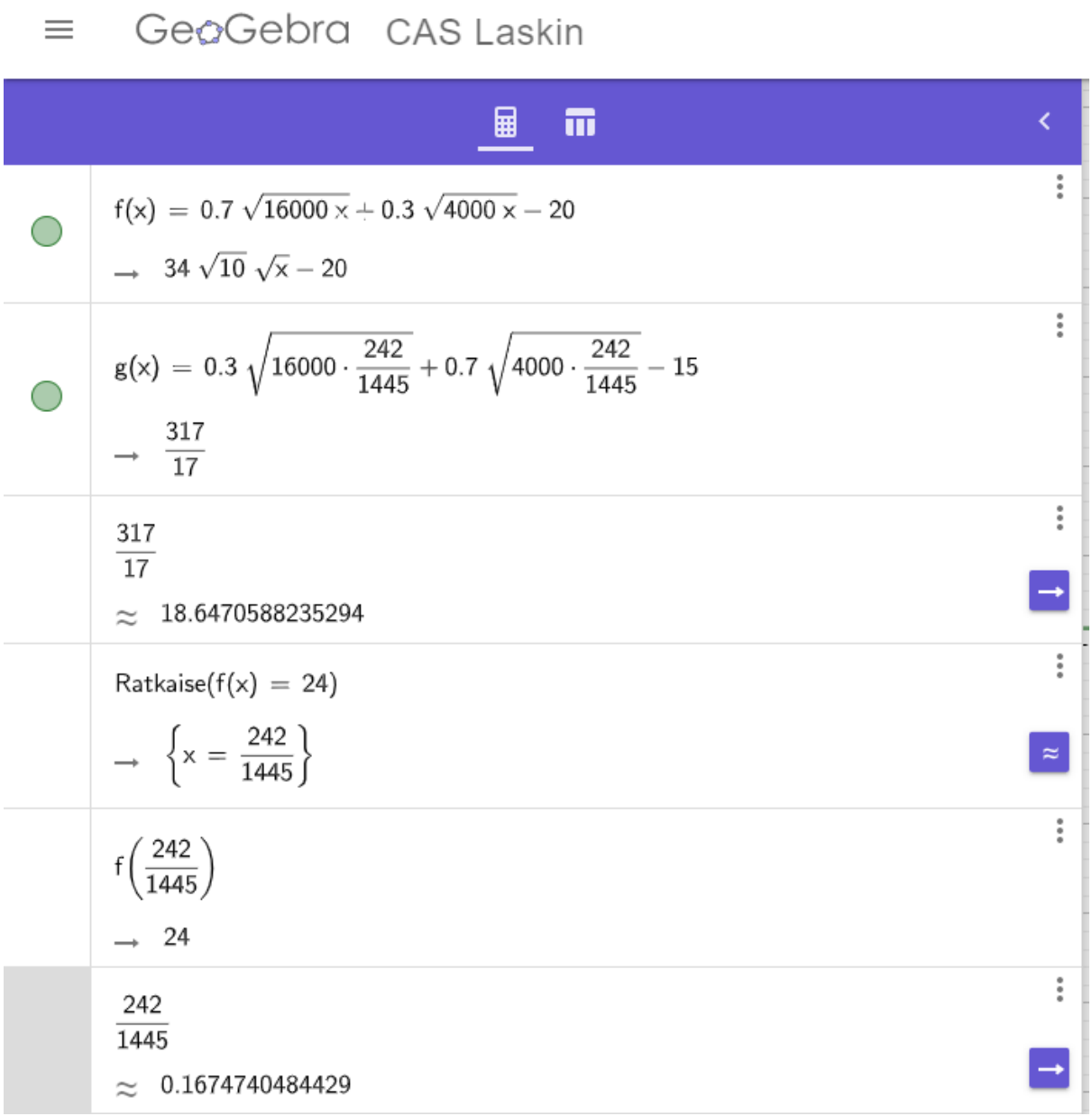
asdoc gamet , payoff(5, 4, 2, 2 \ 3, 1 , 1, 3) player1(Invest DoNotInvest) player2(WorkForTheInvestor WorkForTheManager) ls1(Investor) ls2(Auditor) neps domist, title(The Third Game) label font(Times New Roman) append save(The Games) dec(1)

The Compensation Contract



The minimum profit share is 242/1445 (or 0.167 with three decimals).

One can see from the above that the utility is higher (24) if he works hard compared to when he shirks (317/17 or 18.647 with three decimals).