

Assessment II
CS551K – Software Agent & Multiagent Systems
2020-2021

Instructions to students:

- Your solution should be one single PDF file which you should upload onto MyAberdeen by the established time/deadline. Please do not email us your solution.
- Your file should be named our PDF file should be named “CS551K-ASMNT1-Day-X-YourSurname-YourName-YourIDNo”. For instance, “CS551K-ASMNT1-Day-1-Smith-John-999999.pdf”, where Day 1-5 should be the day of the class test in question, and 999999 is your student ID. Please try to make your submission file less than 10MB as you may have issues uploading large files onto MyAberdeen.
- Indicate clearly in your submission which item each solution is for. If we cannot identify this, you may be marked down.

Bargaining

1. Two agents (1 and 2) should decide on how to split £100. The two agents will make alternating offers and they prefer to get to an agreement sooner than later as they may be able to invest their money. For agent 1, £0.95 received now is equivalent to £1 received at the next round whereas, for agent 2, £0.89 received now is equivalent to £1 received at the next round.
 - a) Who will be more willing to get the deal done faster, i.e., which agent is more impatient? Justify your answer (answers without justification will merit 0 marks) **(0.5 Mark)**
 - b) Let x be the amount that agent 1 will get if he starts the negotiations, y be the amount that agent 2 will get if he starts the negotiations. Express x with respect to y , y with respect to x and compute the value of x and y . **(1.5 Marks)**
 - c) What is the amount that agent 2 will get if agent 1 starts the negotiations? Similarly, what is the amount that agent 1 will get if agent 2 starts the negotiations? What can you conclude? **(2 Marks)**
 - d) Compare the amount that the more impatient agent will get to the amount of the other agent. What is the proportions of the shares of agent 1 and agent 2? **(1 Mark)**
2. Consider the following case where two agents (1 and 2) have identified 6 possible deals, as described in the table below. Assume that the Zeuthen strategy is used.

| <i>deals</i> | <i>utility₁(d_i)</i> | <i>utility₂(d_i)</i> |
|--------------|-------------------------------------------|-------------------------------------------|
| d_1 | 10 | 5 |
| d_2 | 15 | 0 |
| d_3 | 0 | 5 |
| d_4 | 5 | 0 |
| d_5 | 10 | 0 |
| d_6 | 5 | 5 |

- a) Provide the trace of the negotiation algorithm for each round. Your answer should include the agent(s) who conceded and the deals proposed by each agent. **(2 Marks)**
- b) What would the final deal be? **(1 Mark)**