

# **Guide for Practical Assignment 14November**

W.Pasman, K. Hindriks, November 12, 2007.

## **Introduction**

This document guides you through the practical assignment of the course.

Needed for this assignment: a paper version of this document, scratch paper, pen, pocket calculator, printed-out fill-in forms attached at the end of this document, and instruction forms. All documents that you need are also available in the zip file that you will download at 9:15.

We assume that you have finished and read the assignment.pdf and userguide.pdf provided to you via the BB Negotiator4Nov\*.zip file, and that you have practiced with the environment and laptop domain.

This document consists of four parts: an introduction where you negotiate against the computer to get some feeling for a new negotiation agent, section I where you create a utility space for a party domain, section II where you negotiate with another student in this domain, and section III where you negotiate in this domain against a computer. Please follow the steps carefully as there is not enough time to re-do them without missing the deadlines.

## **Short overview of the important times**

9:15. Play with a new negotiation agent, BayesianAgent.

9:50. Set your preferences for the details of a party that you are going to organize

10:30. Make a deal with another student on the party details

11:15 Make a deal with the computer representing another student on the party details

## Detailed Instructions

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- 9:00 Overview of Experiment and Brief Introductory Remarks about Negotiation.
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- 915
- go to a computer (one computer per person).
  - Log in Blackboard (**BB**)
  - fetch the Negotiator14Nov.zip file from BB (IN4010TU 2007-2008/Assignments/ Practical AI 2007)
  - Install the file as described in the Negotiation User Guide.
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- 925
- The coming 10 minutes you have some time to familiarize yourself with a new automatic negotiation agent, called the BayesianAgent. This agent is a somewhat more sophisticated negotiator than the simple agent provided to you earlier. You will play with the Bayesian Agent in the laptop domain that you have used already at home.
- We will first briefly repeat the steps related to creating the laptop buyer utility template. You want to buy a new laptop and have saved € 1200. Your first task preparing the negotiations with the seller is to adjust your preferences.
- Start the editor
  - Set, as a buyer, your utilities for the laptop domain, as follows
    - Follow the steps in section 3 ("Profile Creation", p.8) in the Negotiation User Guide but use the **laptop\_domain.xml** and **laptop\_empty\_utility.xml** file in negotiator/templates/laptopdomain.
    - Adjust the utilities and set the evaluation values and weights according to your preferences and budget.
    - Save your utility space as **laptop\_buyer\_utility.xml** in the same directory (negotiator/templates/laptopdomain)
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- Start the negotiator simulator as discussed in section 4 ("Running Negotiations", p.12) in the user guide.
  - Use the top "Browse" button and select the negotiator/templates/laptopdomain/laptop\_domain.xml file. The other fields will be filled in appropriately (assuming you saved the laptop\_buyer\_utility.xml as prescribed in the previous section).
  - Press "Start"
- The UIAgent interface will pop up after a few seconds, or immediately if you have the first turn in the negotiation.



Also do a negotiation with the 'agents.UIAgent' for both parties, so that you can see what both parties are doing.

Answer the following questions for yourself, to make sure you understand what's going on:

- (1) Why does the utility value go to 0 for some bid settings?
  - (2) Why does the opponent see a different utility for your bid than you saw when you adjusted your bid?
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945	<p>You are going to organize a party together with a friend. You have collected € 1200. You made a list with the options for the various issues and estimated the associated cost with these options. Your friend has slightly different ideas on how the money should be spent and you both decided to negotiate about it, to reach a deal.</p> <p>Read the information about the party domain, in the "Negotiation Profile Template" attached at the end of this document.</p>
950	<ul style="list-style-type: none"> <li>• Start the editor</li> <li>• use the "Load Domain" menu to open the negotiator/templates/partydomain</li> </ul>
section	<p>/party_domain.xml file</p> <ul style="list-style-type: none"> <li>• use the "Load Utility Space" menu to open the party_utility_empty.xml file.</li> </ul>
I	<ul style="list-style-type: none"> <li>• edit the utility space as above, and set the evaluation values and weights according to your preferences and budget.</li> <li>• Save your utility space as <b>party_FL_utility.xml</b> in the same directory (negotiator/templates/partydomain), where FL is your first and last name (without spaces inbetween, all in lower case).</li> <li>• Copy the values with the weights on the attached form. For each issue you must copy <ol style="list-style-type: none"> <li>1. Your utility value for each option in that category. This indicates which option you prefer for each category.</li> <li>2. The relative importance of that category to you (weight). This indicates how much you care for a certain category. So if you are only interested in food, but could not care less about music, food will have a high weight for you and music a low weight.</li> </ol> </li> </ul> <p>Mail the party_FL_utility.xml file that you created (where FL is your first+last name construct as above) to <a href="mailto:ai@mmi.tudelft.nl">ai@mmi.tudelft.nl</a>, clearly stating your name and student ID. Keep your form as a copy, you will need it later today.</p>
<b>1015</b>	Break
1030	<p>The coming 30 minutes you will negotiate against another student on the party domain, with both of your utility spaces as the basis for the negotiation.</p> <p>Consult the paper near the entrance.</p>
II	<ul style="list-style-type: none"> <li>• copy your <b>code number</b> NN , which is the number in the brackets after <b>your</b> name on that form.</li> <li>• look in the other column for the name of your negotiation partner is. Locate him.</li> <li>• Do the negotiation. Use your pocket calculator as needed. Make sure you end the negotiation about four minutes before the deadline, so that you have time to copy the final agreement to paper.</li> <li>• Fill in the form "Negotiation Agreement Template" attached at the end of this document, with the negotiation result that you agreed on with your opponent. This form contains the one bid that is agreed on, together with the student numbers of both parties. Remember that the your utility of that bid will contribute to your score.</li> </ul> <p>Hand in your agreement form.</p>
<b>1100</b>	Break

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- 1115 section III
- Download the file utilities.zip from from BB at IN4010TU ARTIFICIAL INTELLIGENCE (2007-2008 Q1) (6056-070801) > ASSIGNMENTS > NEGOTIATION EXPERIMENT. Extract the party\_NN\_utility.xml (NN being your code number) save it in the negotiator/templates/partydomain directory.
  - Start the negotiator simulator as discussed in section 4 ("Running Negotiations", p.12) in the user guide.
  - Use the top "Browse" button and select the negotiator/templates/partydomain/party\_domain.xml file. The other fields will be automatically filled in as in this picture:

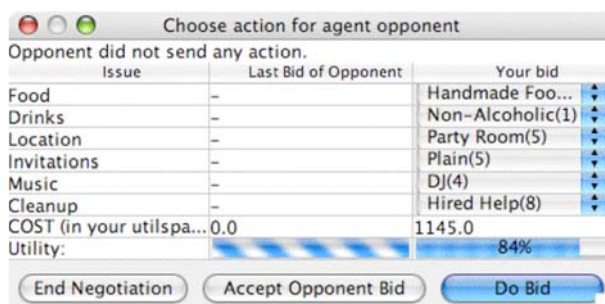


- Substitute the FL in the "Agent A utility space" field with your name as entered in section I.
- Substitute the NN in the "Agent B utility space" with your code number as from section II.
- Press "Start",

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- 1125
- The coming 30 minutes you have time to negotiate against the computer. It is **not** allowed to restart the negotiation session so be careful with your bids. You have plenty of time. If you finish early that's fine, but make sure you finish within half an hour (you both will get a score of 0 in that case).

The UIAgent interface will pop up after a few seconds, or immediately if you have the first turn in the negotiation.

- Negotiate against your opponent and try to reach a good utility for yourself, as the utility of the bid you agree on is part of your final rating.



- When you are finished, raise your hand. One of the assistants will copy your result and you're done.

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1155

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# Negotiation Profile Template

IN4010TU Artificial Intelligence Techniques

This document provides you with a template to create a preference profile for the party domain. The Table below exhibits the domain structure, i.e. the issues and the associated issue values. The issue values define the range of potential outcomes of a negotiated agreement in this domain. The Table also includes a description of each of these issue values and an associated cost.

An editor is available to facilitate you in the construction of your preference profile. You must use this editor since you are also required to save your profile digitally as an .xml file (See for instructions on using this editor the Negotiation User Guide). Among others, the editor will facilitate you by normalizing the weights automatically.

You are requested to complete the Table by performing two tasks:

- i. Fill in real-numbered weights, one associated with each issue; *Make sure the weights sum up to one on the template.*
- ii. Rank order the issue values *within each issue* in accordance with your own preferences by entering natural numbers  $> 0$  – also called *evaluations* – associated with each issue value.

The natural numbers associated with issue values may be, for example, 1, 2, 3, 4, but may also indicate strong preference for issue value 3, for example, by writing down 1, 1, 6, 2; here 6 indicates strong preference for issue value 3 over the others. Please keep the following in mind.

- The preference profile that you create will be used to assess your performance during negotiation. It will be used in part to determine your grade. The better the outcome you achieve in a negotiation reflects your profile the higher your grade.

- Agreements reached in a negotiation about the party domain *may not exceed the budget of 1200*.

Please take into consideration that this constraints means you should not assign the highest preference to a bid (i.e. evaluations to a set of issue values) that has a total cost that exceeds the available budget; such bids will end up having a utility of 0 since they violate the cost constraint.

As a result, you will not be able to reach an agreement that yields maximum utility for you, even before you have begun to negotiate! The editor will not indicate this automatically, so you have to consider costs while entering your preferences yourself.

Good luck.

Category	Choice	Description	Cost	Weight	Utility
Food	Chips and Nuts	Buy bags of chips and party nuts for all guests.	100		
	Finger-food	Diced cheese, sliced sausage, deep fried stuff. More tasty than chips and nuts, but more expensive.	170		
	Handmade Food	Custom snacks, hours d'oeuvres etc. Less expansive than finger-food, but more work.	120		
	Catering	Outsource the food, if you will. The least work, the highest cost.	250		
Drinks	Non-Alcoholic	Soda's, ice water, etc.	75		
	Beer Only	More than enough beers for everybody. It has alcohol, but is more expensive.	300		
	Handmade Cocktails	Mix your own drinks. More work, but less expensive than a trainload of beer.	200		
	Catering	Let some company do the drinks. Least work, highest cost.	450		
Location	Party Tent	A tent on some field somewhere. Roomy, but outdoors.	200		
	Your Dorm	Give the party in your dormitory. It's home, but there is less room.	100		
	Party Room	Hire a standard party room. Enough room, no outdoor problems. It costs more, though.	400		
	Ballroom	The fanciest option. A beautifully decorated ballroom with everything you need.	600		
Invitations	Plain	Write the address on pieces of paper and hand those out.	25		
	Photo	Take a nice picture of something, or buy one in the store, and write on the back of that. More expensive, but prettier.	75		
	Custom, Handmade	Custom shape card. More work, a tad less expensive than the photo option.	50		
	Custom, Printed	Design the card, then let somebody else print it. You pay a lot, but do the least.	150		
Music	MP3	Plug some boxes into your computer and run off your MP3 collection. More work, the wiring costs money.	100		
	DJ	Hire a DJ to play off his MP3 collection. No work for you during the party, but more expensive.	250		
	Band	Hire a party band for live music. The most expensive, but it is live music.	350		
Cleanup	Water and Soap	This will take a lot of scrubbing. It is cheap, but by far the most work.	20		
	Specialized Materials	Specialized materials will help cleaning a lot, but it is more expensive.	60		
	Special Equipment	Rent a CleanMaster 3000 and see those stains disappear in no time. Yet less work, yet more money.	150		
	Hired Help	Hire somebody else to do your dirty work. No work, but pricey.	200		

Table 1: Choices for each category

## Negotiation Agreement Template

The template below is provided to you to record the agreement you reach in the Human-Human negotiation round, if any. Please fill in the name of you and your fellow negotiator as well as your student numbers. At the end of the negotiation round this template needs to be handed in. Please indicate the agreement you reached by writing down a cross × next to each issue value you agreed on for each issue. Note that the agreement reached will partly determine your grade.

Good luck.



Name Negotiator 1:	Sign below for agreement
Student number:	

Name Negotiator 2:	Sign below for agreement
Student Number:	

Category	Choice	Description	Cost	Agreement
Food	Chips and Nuts	Buy bags of chips and party nuts for all guests.	100	
	Finger-food	Diced cheese, sliced sausage, deep fried stuff. More tasty than chips and nuts, but more expensive.	170	
	Handmade Food	Custom snacks, hours d'oeuvres etc. Less expensive than finger-food, but more work.	120	
	Catering	Outsource the food, if you will. The least work, the highest cost.	250	
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	Party Room	Hire a standard party room. Enough room, no outdoor problems. It costs more, though.	400	
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