Bahria University Cafe Model V.1

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1 Introduction

This model is created in Netlogo 6.0.2 which is used to create the Agent Based Models. This is the first version of a model. In this initial version of "Bahria University Cafe Model" we design number of male and female agents, the exact locations of tables and the number of seating places. Students come and sit on the locations following the path between tables only. And then after random time, they leave the cafe. Male and Female students do not sit on the same side.

2 working

The rules of this model are exact locations of tables and the number of seating places. Students come and sit on the locations following the path between tables only. And then after random time, they leave the cafe. Male and Female students do not sit on the same side.

3 Use of Model

Choose the number of male students and also the number of female students. Examine the moving time of students to their seating places and how much time they spend in cafe and returned. Then press the setup button to initialize the model and press go button to run the simulation of model.

4 Bahria University Cafeteria Model Design In Netlogo

See "Bahria University Cafeteria Model Design in Netlogo" in figure 1. In this model interface had two buttons one is setup used to initialize the model and then second button is go which is used to run the simulations. Then two sliders are used to control the number of male and female student agents. This model contain four tables in a cafeteria and seven chairs on each table both sides. Students go to the cafeteria order some food, eat food and went out.

5 ODD Model of "Bahria University Cafeteria"

ODD stands for Overview, Design concept, and Details. It was first developed by V.Grimm et al. in 2006. The model got updated in 2010. ODD is a technique i.e. textually based specification which is used for documenting Agent Based Models (ABM). ODD model provides a checklist which wraps up the important features of the model. It mainly consists of three features i.e. Overview, Design concept, and Detail. These three features are further divided into other subparts.

6 Specification according to ODD

6.1 Overview

6.1.1 Purpose

The basic purpose is to understand the combination of agent based and exploratory agent based modeling approaches that can be used to simulate Bahria University Cafe Model. The next step would be validating the model with respect to the real world entities.
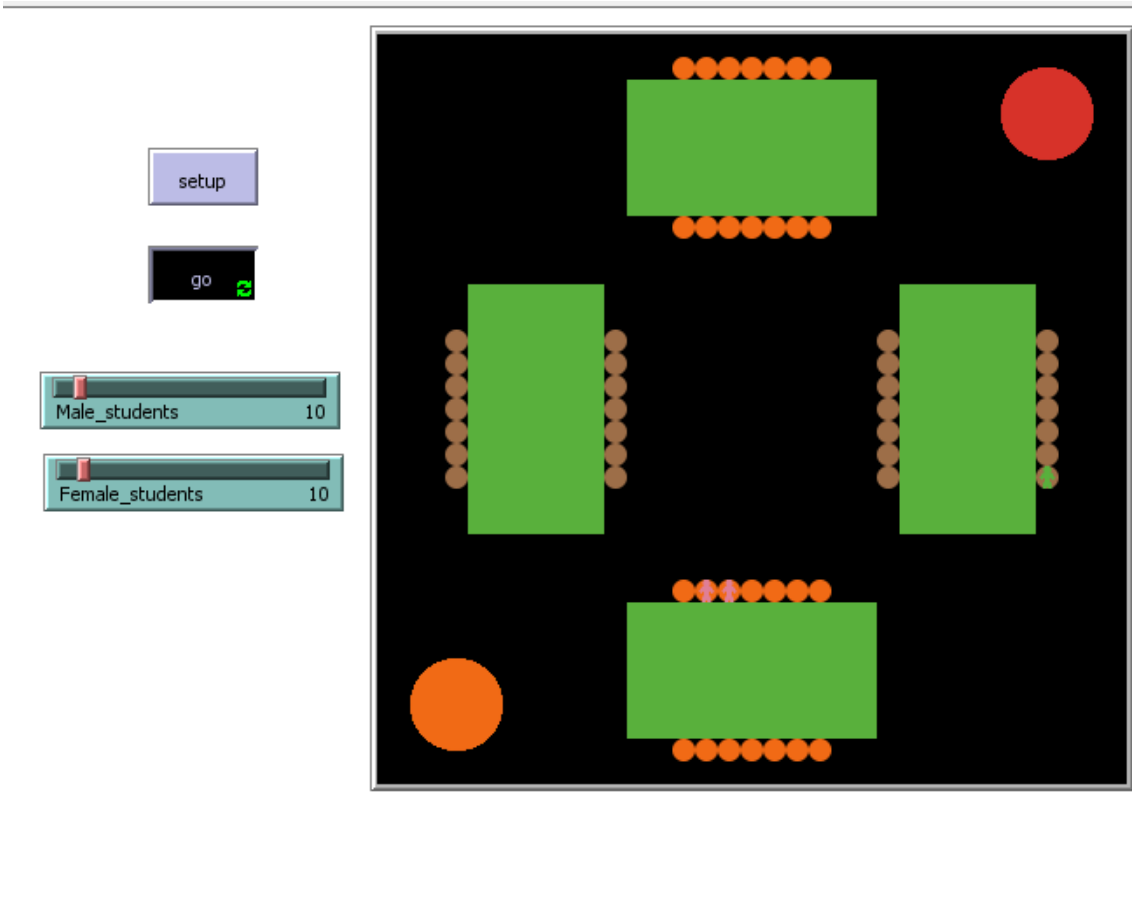
Figure 1: Bahria University Cafe Model Version 1.

6.1.2 Entities

There are several types of agents involved,

1. Number of male students

2. Number of female students

3. Number of waiters

4. Number of tables

5. Number of chairs

6.1.3 Process

The Bahria University Cafeteria concept is deployed for students refreshments. Students come to the cafe, eat and drink.

6.2 Design Concepts

6.2.1 Basic principles

The basic hypothesis of the model is that an exploratory agent based approach is good for modeling this model. In our case we used a combination of agent based and exploratory agent based modeling approaches.

6.2.2 Emergence

This factor gives the information about the expected behavior of the model i.e. what will be the output of the model.

6.2.3 Adaptation

This feature shows the decision making ability of the agents in different environments.

6.2.4 Objectives

The main objective this model are exact locations of tables and the number of seating places. Students come and sit on the locations following the path between tables only. And then after random time, they leave the cafe. Male and Female students do not sit on the same side.

7 Results And Discussion

7.1 Behavior Space Experiments

Behavior space experiment with first parameter, numbers of male students
Behavior space experiment with second parameter, numbers of male students
Behavior space experiment with first parameter, number of male students
Behavior space experiment with second parameter, numbers of male students

7.2 Discussion

This is a first version of Bahira University Cafeteria Model. In this model, exact locations of tables and the number of seating places. Students come and sit on the locations following the path between tables only. And then after random time, they leave the cafe. Male and Female students do not sit on the same side. We also update this model in second version of the model.

	A	B	C	D	E
05	20	10	10	14	20
06	20	10	10	15	20
07	20	10	10	16	20
08	20	10	10	17	20
09	20	10	10	18	20
10	20	10	10	19	20
11	20	10	10	20	20
12	17	10	10	5	20
13	17	10	10	6	20
14	17	10	10	7	20
15	17	10	10	8	20
16	17	10	10	9	20
17	17	10	10	10	20
18	17	10	10	11	20
19	17	10	10	12	20
20	17	10	10	13	20
21	17	10	10	14	20
22	17	10	10	15	20
23	17	10	10	16	20
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25	17	10	10	18	20
26	17	10	10	19	20
27	17	10	10	20	20
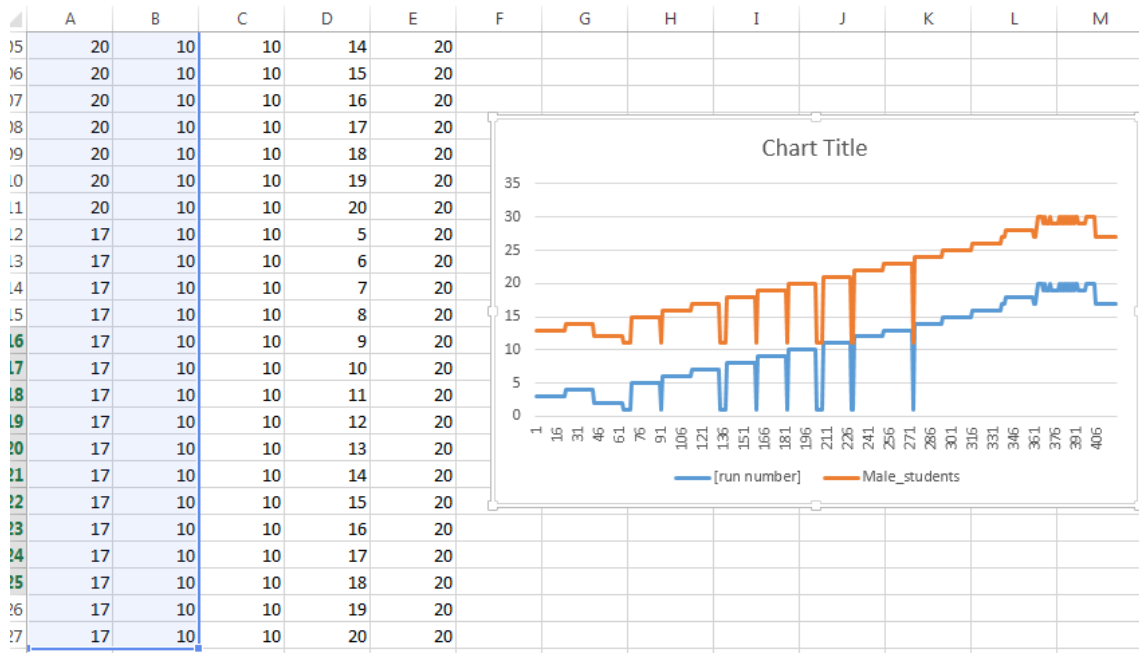
Figure 2: Behavior space with 20 cycles number of male students of Bahria University Cafe Model Version 1.

	A	B	C	D	E
07	20	10		16	20
08	20	10		17	20
09	20	10		18	20
10	20	10		19	20
11	20	10		20	20
12	17	10		5	20
13	17	10		6	20
14	17	10		7	20
15	17	10		8	20
16	17	10		9	20
17	17	10		10	20
18	17	10		11	20
19	17	10		12	20
20	17	10		13	20
21	17	10		14	20
22	17	10		15	20
23	17	10		16	20
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26	17	10		19	20
27	17	10		20	20
28					
29					
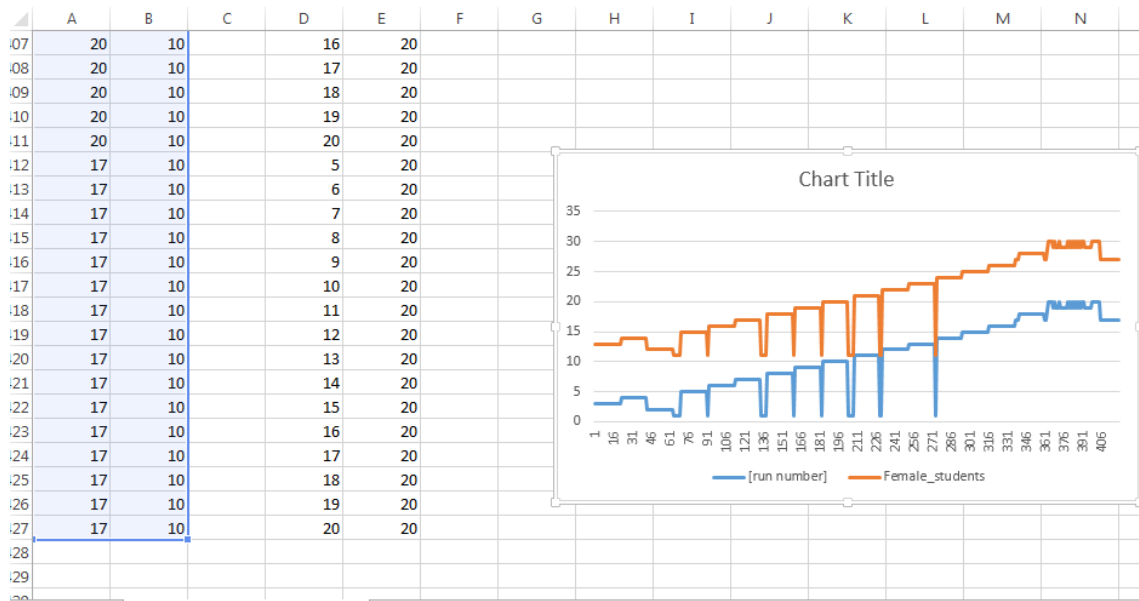
Figure 3: Behavior space with 20 cycles number of female students of Bahria University Cafe Model Version 1.

	A	B	C	D	E	F	G	H	I	J	K	L	M
918	30	30	15	24	45								
919	30	30	15	25	45								
920	30	30	15	26	45								
921	30	30	15	27	45								
922	30	30	15	28	45								
923	30	30	15	29	45								
924	30	30	15	30	45								
925	20	30	15	18	45								
926	20	30	15	19	45								
927	20	30	15	20	45								
928	20	30	15	21	45								
929	20	30	15	22	45								
930	20	30	15	23	45								
931	20	30	15	24	45								
932	20	30	15	25	45								
933	20	30	15	26	45								
934	20	30	15	27	45								
935	20	30	15	28	45								
936	20	30	15	29	45								
937	20	30	15	30	45								
938													
939													
940													
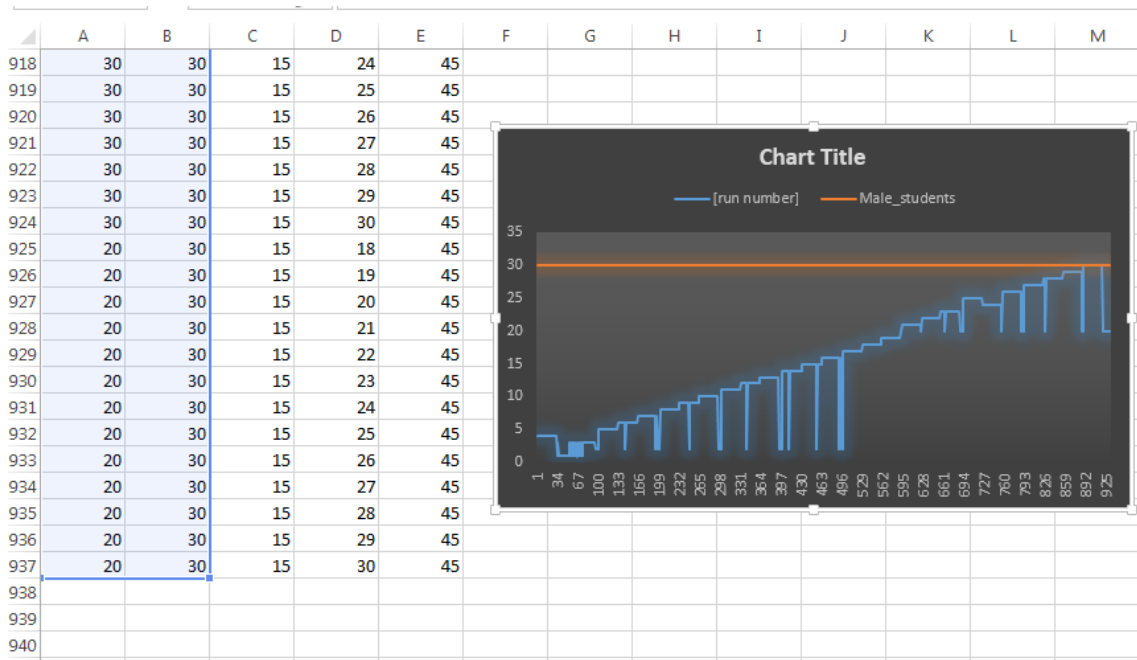
Figure 4: Behavior space with 30 cycles number of male students of Bahria University Cafe Model Version 1.

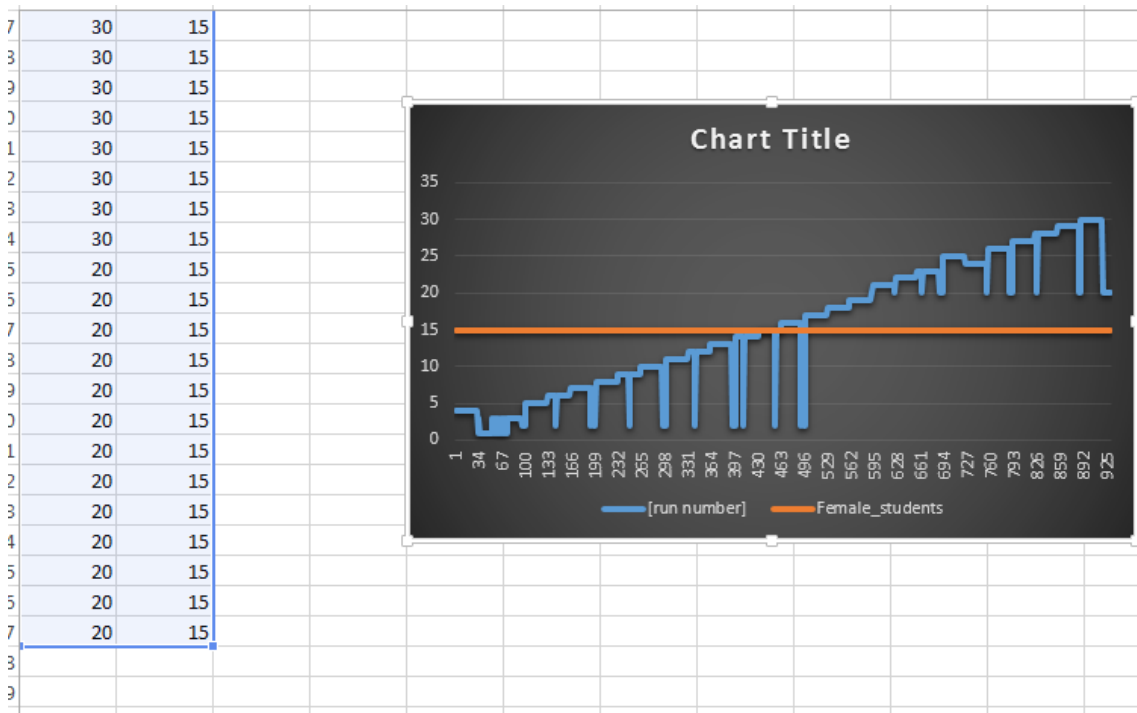|		
7	30	15
3	30	15
9	30	15
0	30	15
1	30	15
2	30	15
3	30	15
4	30	15
5	20	15
5	20	15
7	20	15
3	20	15
9	20	15
0	20	15
1	20	15
2	20	15
3	20	15
4	20	15
5	20	15
5	20	15
7	20	15
3		
9		

Figure 5: Behavior space with 30 cycles number of female students of Bahria University Cafe Model Version 1.