



IE3081 – Modeling and Discrete Simulation Course

Homework-4

	AD SOYAD	NUMARA
1	Berkkan RENÇBER	150119011
2	Murat ÖZCAN	150119008
3	Samet CAN	150120528

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1) OBJECTIVES

- Ensure that all personnel benefit from the system.
- Increase the number of students benefiting from the system in a specific time.
- Reducing student waiting time in the queue.
- Adjust the number of staff in accordance with the requirements of the system.

2) RE-DETERMINING SYSTEM COMPONENTS

a) ENTITIES

- **Student:** This is the agent that makes up the majority of the system.
- **Personnel:** This is the secondary agent of the system .
- **Staff:** This is the agent who fills the dishes.

b) ATTRIBUTES

- **Capacity:** Number of tables
- **Speed:** Speed of staff

c) ACTIVITIES

- **Eating:** Students and personnels eat their food.
- **Filling:** Staff fill the dishes.

d) EVENT

- Number of tables below capacity
- Transfer of student to personnel queue
- Refusal of students and personnel to eat
- **Exogenous** – Arrival of a student
- **Endogenous** – Completion of service of student and personnel
- **Endogenous** – Completion of eating of student and personnel

e) STATE VARIABLES

- The number of busy staff
- Student and personnel waiting in the queue
- Status of table (full,empty)

3) PERFORMANCE METRICS

- a) Average waiting time of staff in queue
- b) Average waiting time of student in queue
- c) Average filling time
- d) Average eating time of student/personnel
- e) Idle time of service
- f) Idle time of tables
- g) Average time student spends in the system
- h) Average time personnel spends in the system

4) ALTERNATIVE SYSTEM DESIGN

- 1. Changing the number of staff
- 2. Changing the number of tables

5) CONCEPTUAL MODEL

