Use Case for Main Menu

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| Step | User’s Action | System’s Response |
| 1 |  | User is welcomed and asked for the arrival rate of patients (patients/hour) |
| 2 | User enters the number of patients per hour |  |
| 3 |  | If the number entered is less than 1 or greater than 60, the user is informed that the given rate is out of range and then is prompted for a new number. |
| 4 |  | System divides result by 60 and then sets the arrival rate field in WaitingRoom class (patients/min) |
| 5 |  | User is prompted for the number of doctors that are working |
| 6 | User enters the number of doctors that are working |  |
| 7 |  | If the number is less than 1 or greater than 20, the user is informed that the given number is out of range and then is prompted for a new number. |
| 8 |  | System changes number of doctors in the EmergencyRoom class to the user specified value |
| 9 |  | User is prompted for the number of nurses that are working |
| 10 | User enters the number of doctors that are working |  |
| 11 |  | If the number is less than 1 or greater than 20, the user is informed that the given number is out of range and then is prompted for a new number. |
| 12 |  | System changes number of nurses in the EmergencyRoom class to the user specified value |
| 13 |  | System runs simulation |
| 14 |  | System outputs the number of people served, the total wait time of all patients, and the average wait time per patient |
| 15 |  | System displays menu with options to list the names of all residents that were treated, and retrieve the record of a resident by name |
| 16 | User picks an option |  |

Use case for post-simulation menu (list names)

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| Step | User’s Action | System’s Response |
| 1 | User chooses to display the names of all the residents that were treated |  |
| 2 |  | System lists the names of all those that were treated |

Use case for post-simulation menu (retrieve record)

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| Step | User’s Action | System’s Response |
| 1 | User chooses to retrieve a record of a patient |  |
| 2 |  | System displays all the times the individual was in the hospital (or says they weren’t if they were not). System also displays the severity of the individual’s injuries and time spent waiting in the hospital by that patient |

Use Case for During Simulation

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| Step | User’s Action (clock) | System’s Response |
| 1 | Clock is increased |  |
| 2 |  | System checks to see if clock has exceeded total time, if so the simulation terminates |
| 3 |  | System randomly chooses number between 0 and 1, if that number is less than the arrival rate for patients then a patient is added to one of the WaitingRoom priority queues. The queue is determined by a second randomly generated number between 0 and 9. If the second number is less than 7 the patient is assigned a severity between 1 and 10 and is placed in the minor\_queue (priority queue) on WaitingRoom. If the number is 7 or 8 then the patient is assigned a severity of 11-15 and is placed in the serious\_queue (priority queue) in WaitingRoom. If the number is 9 the patient is assigned a severity of 16-20 and is placed in the serious\_queue (priority queue) in WaitingRoom. |
| 4 |  | System checks to see if any of the nurses’ queues are empty, if they are a patient is moved out of the minor\_queue in WaitingRoom and into that nurse’s queue in the EmergencyRoom class. The patient is also given a number 1-10 that indicates how long the patient will need to be treated for. |
| 5 |  | If a nurse’s queue has someone in it, the system checks to see if enough time has elapsed to fully treat the patient. If not, nothing happens. However, if enough time has elapsed the system updates the patients exit time, adds the patient’s total wait time to the overall total wait time, adds one to the amount of people the hospital has served, and adds one to the number that the nurses have served. |
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