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## Graded Assignment 2 - Joaquin Pablo Hospital

### GA2 - Joaquin Pablo Hospital

0 points possible (ungraded)

The Joaquin Pablo Hospital in the city of Las Tablas has an Urgent Care room open around the clock, to serve patients from many neighboring towns. Based on records collected over the last year, the rate of arrival for the patients at the Urgent Care room is estimated to be approximately 20 patients per hour, with an exponential distribution.

Based on the records from the last year, it is estimated that approximately 20% of the patients will only need to see a nurse, and will be discharged after that; 40% of the patients will only need to see a doctor, and will be discharged after that; and the remaining 40% will need to first see a nurse, then see a doctor, and then will be discharged.

Based on observations conducted by hospital administratives, once a patient gets to see the nurse, the time it takes the nurse to get the patient ready to be discharged seems to follow a triangular distribution, with a minimum of 15 minutes, a mode of 30 minutes, and a maximum of 60 minutes. The same distribution applies irrespective of whether the patient will only see the nurse or will later go to see the doctor.

Based on the same observations conducted by hospital administratives, once a patient gets to see the doctor, the time it takes the doctor to get the patient ready to be discharged also seems to follow a triangular distribution, with a minimum of 10 minutes, a mode of 20 minutes, and a maximum of 30 minutes.

Currently, the Urgent Care room has available at any given time a total of 11 doctors and 14 nurses.

Create a discrete-event simulation of the patients arriving at the hospital, and seeing the nurses and doctors as described above, and then being discharged. Run a simulation from time 0 to time 144000 minutes. Then do a thorough sanity check to verify that the number of patients that arrives at the hospital, as well as their flow to nurses and doctors, correspond to the description of the problem above.

Have you done the sanity check?

It is in your best interest.

Yes! As recommended, I have done it. ▼



Submit

You have used 1 of 2 attempts

✓ Correct

**A word on format:** The following six questions refer to utilization. In all of these questions, enter your answer as a decimal, not a percentage, with at least two decimals. For example, if your answer is 12.3%, enter 0.12 as your answer.

**A word on tolerances:** Due to the uncertain nature of simulations, all of your answers to the six questions below will be evaluated with a 0.02 tolerance. Be aware that an answer may be graded as correct even if it is 0.02 off from our expected value.

## Part 1

0.5/0.5 points (graded)

What is the utilization of doctors?

Enter your answer in decimal form using two decimal places. For example, if your answer is 23.24%, you should enter .23 in the box below.



You have used 1 of 2 attempts

✓ Correct (0.5/0.5 points)

## Part 2

0.5/0.5 points (graded)

What is the utilization of nurses?

Enter your answer in decimal form using two decimal places. For example, if your answer is 23.24%, you should enter .23 in the box below.



You have used 1 of 2 attempts

✓ Correct (0.5/0.5 points)

## Part 3

1/1 point (graded)

The Nurse Union is considering a partial strike that would - if it takes place - reduce the number of available nurses to only 7 at any given time.

Under this scenario, what would be the utilization of the 7 nurses that are not in the strike?

Enter your answer in decimal form using two decimal places. For example, if your answer is 23.24%, you should enter .23 in the box below.



0.99

Submit

You have used 1 of 2 attempts

✓ Correct (1/1 point)

## Part 4

1/1 point (graded)

The Nurse Union decided not to conduct the strike, so the number of nurses is at its normal level.

The hospital is now considering hiring some new doctors, so that a total of 15 doctors would be available at any given time.

If there were 15 doctors available at any given time, what would be the utilization of the doctors?

Enter your answer in decimal form using two decimal places. For example, if your answer is 23.24%, you should enter .23 in the box below.



0.35

Submit

You have used 1 of 2 attempts

✓ Correct (1/1 point)

## Part 5

1/1 point (graded)

The hospital decided not to hire the new doctors, so the number of doctors is at its normal level.

The hospital is now considering requiring doctors to complete a form with each patient they see. This would add 8 minutes to the time the doctor spends with each patient (in all cases).

If the doctors are required to spend these 8 additional minutes with each patient, what would be the utilization of the doctors?

Enter your answer in decimal form using two decimal places. For example, if your answer is 23.24%, you should enter .23 in the box below.

**0.66**

You have used 1 of 2 attempts

✓ Correct (1/1 point)

## Part 6

1/1 point (graded)

The hospital decided not to require the doctors to fill out the forms, so the times that doctors spend with their patients are at their normal levels.

The main hospital in the nearby city of Chitre is going to be demolished to build a new one in its place. The patients that would have gone to the Urgent Care room of that hospital in Chitre are now expected to come to the Urgent Care room of the Joaquin Pablo Hospital in Las Tablas. It is expected that this will bring the arrival rate of patients up to 27 per hour. Run a simulation with this arrival rate, from time 0 to time 107000 minutes. If the patient arrival rate was 27 patients per hour...

...what would be the utilization of the doctors?

Enter your answer in decimal form using two decimal places. For example, if your answer is 23.24%, you should enter .23 in the box below.

**0.64**

...and what would be the utilization of the nurses?

Enter your answer in decimal form using two decimal places. For example, if your answer is 23.24%, you should enter .23 in the box below.

**0.67**

You have used 1 of 2 attempts

✔ Correct (1/1 point)