

COMP9334

Capacity Planning for Computer Systems and Networks

Week 1: Revision problem set

Question 1

- An important part of performance analysis is to model the workload. In this question, you will look at a very simple model and we will generalise it to a very well known model in performance analysis in the lecture in Week 2.
- Consider a user who may send HTTP requests to a web server. In the time interval $[k \delta, (k+1) \delta)$ where k is a non-negative integer, there is a probability of p that this user will send an HTTP request to a web server and there is a probability of $(1-p)$ that this user will not send. Assuming that the probability the user sends (or not send) in each time interval is independent. Assuming that the current time is 10δ , what is the probability that this user will not send an HTTP request to the web server before 30δ ?

Question 2

- This is a revision question on probability distribution which you should be able to solve if you have the pre-requisites.
- Consider a continuous probability distribution with sample space is $[1, \infty)$ and probability density function
 - $f(x) = a / x^3$ for $x \geq 1$
- What is the value of a in order that $f(x)$ be a valid probability density function?
- Given this probability density function, what is the probability that a number drawn from this distribution has a value greater than 10?