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 $10\delta$, what is the probability that this user will not send an HTTP request to the web server before $30\delta$?
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
  • \(f(x) = \frac{a}{x^3}\) 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?