

COMP9334

# Capacity Planning of Computer Systems and Networks

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Week 1A: Revision problems

## Question 1

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- 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

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- 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?
- What is the probability the probability that a number drawn from this distribution is exactly 10?
- Given this probability density function, what is the probability that a number drawn from this distribution has a value greater than 10?