

# Assignment-5

## (Papoulis Chapter 2 Example 2.2)

J Sai Sri Hari Vamshi  
AI21BTECH11014

May 31, 2022

# Contents

Question

Solution

## Question

Suppose a coin is tossed twice and the outcomes are recorded.  
Then:

- (i) What is the sample space of the outcomes obtained?
- (ii) What is the set of outcomes with heads at the first toss?
- (iii) What is the set of outcomes with only one heads?
- (iv) What is the set of outcomes with heads showing atleast once?

## Solution

When a coin is tossed twice

- (i) The sample space contains the elements:

$$S = \{hh, ht, th, tt\}$$

the set  $S$  has  $2^4 = 16$  subsets since it has 4 elements in its sample space.

- (ii) The set of outcomes with heads at the first toss:

$$A = \{\text{heads at the first toss}\} = \{hh, ht\}$$

## Solution

(iii) The set of outcomes with only one heads:

$$B = \{\textit{only one heads}\} = \{ht, th\}$$

(iv) The set of outcomes with heads showing atleast once:

$$C = \{\textit{heads shows atleast once}\} = \{hh, ht, th\}$$