

Assignment 3

Parvez Alam : AI21RESCH01005

February 2021

2

1 Prob. 2.10

A family has two children. What is the probability that both the children are boys given that at least one of them is a boy ?

Solution:

Let g and b denote girl and boy respectively. then sample space

$$S = \{gg, gb, bg, bb\}$$

E= both the children are boys={bb}

F=at least one of them is a boy={gb,bg,bb}

$$E \cap F = \{bb\}$$

$$P(E) = \frac{1}{4}$$

$$P(F) = \frac{3}{4}$$

$$P(E \cap F) = \frac{1}{4}$$

$$P(E|F) = \frac{P(E \cap F)}{P(F)}$$

$$= \frac{\frac{1}{4}}{\frac{3}{4}}$$

$$= \frac{1}{3}$$

$$= 0.333...$$