UIT2521 – Information Theory and Applications

UNIT II INFORMATION THEORY FUNDAMENTALS

Tutorial – I

Self-Information

Date & Time: 08.08.2024 (Thursday, 5th Hour)

1. Consider a binary system emitting two symbols **{0, 1}** with probabilities **0.6** and **0.4** respectively. Find the information conveyed by bit '0' and bit '1'.

2. Consider a source emitting two symbols $\mathbf{s_0}$ and $\mathbf{s_1}$ with the corresponding probabilities **¾** and **¼** respectively. Find the self-information of the symbols in

   a) Bits
   b) Decits
   c) Nats

3. A pair of dice is rolled simultaneously. The outcome of the first dice is considered to be '**x**' and that of the second as '**y**'. Three events are defined as

   P = {(x, y) such that (x + y) is exactly divisible by 3}
   Q = {(x, y) such that (x + y) is an even number}
   R = {(x, y) such that (x + y) = 7}

   Which event conveys more information? Justify your answer with mathematical calculation.

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