**Assignment 4**

Due on: 28-09-20, 23:59 UTC

1. Consider a 4-bit uniform source with combined equiprobable 2. The average symbol energy $E_s$ is:

```
E_s = \frac{1}{4}\sum_{i=0}^{3} E_i
```

2. Consider a 4-bit uniform source with combined equiprobable 2. The average symbol power $P_s$ is:

```
P_s = \frac{1}{4}\sum_{i=0}^{3} P_i
```

3. Consider a 4-bit uniform source with combined equiprobable 2. The symbol energy $E_s$ is:

```
E_s = \frac{1}{4}\sum_{i=0}^{3} E_i
```

4. Consider a source with 4 symbols, each having the probability of $\frac{1}{4}$ of the source is:

```
\begin{array}{c|c|c|c|c|c}
\text{Symbol} & 0 & 1 & 2 & 3 & P_i \\
\hline
E_i & 1 & 1 & 1 & 1 & \frac{1}{4}
\end{array}
```

5. Consider a source with 4 symbols, each having the symbol energy $E_i$ of:

```
\begin{array}{c|c|c|c|c|c}
\text{Symbol} & 0 & 1 & 2 & 3 & P_i \\
\hline
E_i & 1 & 1 & 1 & 1 & \frac{1}{4}
\end{array}
```

6. Consider a source with 4 symbols, each having the symbol power $P_i$ of:

```
\begin{array}{c|c|c|c|c|c}
\text{Symbol} & 0 & 1 & 2 & 3 & P_i \\
\hline
P_i & 1 & 1 & 1 & 1 & \frac{1}{4}
\end{array}
```

7. The entropy of a 4-bit source, where each symbol occurs with probability $\frac{1}{4}$ is:

```
H(X) = -\sum_{i=0}^{3} P_i \log_2 P_i = -\frac{1}{4}(\log_2 \frac{1}{4} + \log_2 \frac{1}{4} + \log_2 \frac{1}{4} + \log_2 \frac{1}{4}) = 2\text{bits}
```

8. The entropy of a 4-bit source, where each symbol occurs with probability $\frac{1}{4}$ is:

```
H(X) = -\sum_{i=0}^{3} P_i \log_2 P_i = -\frac{1}{4}(\log_2 \frac{1}{4} + \log_2 \frac{1}{4} + \log_2 \frac{1}{4} + \log_2 \frac{1}{4}) = 2\text{bits}
```

9. The entropy of a 4-bit source, where each symbol occurs with probability $\frac{1}{4}$ is:

```
H(X) = -\sum_{i=0}^{3} P_i \log_2 P_i = -\frac{1}{4}(\log_2 \frac{1}{4} + \log_2 \frac{1}{4} + \log_2 \frac{1}{4} + \log_2 \frac{1}{4}) = 2\text{bits}
```

10. The entropy of a 4-bit source, where each symbol occurs with probability $\frac{1}{4}$ is:

```
H(X) = -\sum_{i=0}^{3} P_i \log_2 P_i = -\frac{1}{4}(\log_2 \frac{1}{4} + \log_2 \frac{1}{4} + \log_2 \frac{1}{4} + \log_2 \frac{1}{4}) = 2\text{bits}
```

11. Consider a source with 4 symbols, each having the symbol energy $E_i$ of:

```
\begin{array}{c|c|c|c|c|c}
\text{Symbol} & 0 & 1 & 2 & 3 & P_i \\
\hline
E_i & 1 & 1 & 1 & 1 & \frac{1}{4}
\end{array}
```

12. Consider a source with 4 symbols, each having the symbol power $P_i$ of:

```
\begin{array}{c|c|c|c|c|c}
\text{Symbol} & 0 & 1 & 2 & 3 & P_i \\
\hline
P_i & 1 & 1 & 1 & 1 & \frac{1}{4}
\end{array}
```

13. Consider a source with 4 symbols, each having the symbol power $P_i$ of:

```
\begin{array}{c|c|c|c|c|c}
\text{Symbol} & 0 & 1 & 2 & 3 & P_i \\
\hline
P_i & 1 & 1 & 1 & 1 & \frac{1}{4}
\end{array}
```

14. Consider a source with 4 symbols, each having the symbol power $P_i$ of:

```
\begin{array}{c|c|c|c|c|c}
\text{Symbol} & 0 & 1 & 2 & 3 & P_i \\
\hline
P_i & 1 & 1 & 1 & 1 & \frac{1}{4}
\end{array}
```

15. Consider a source with 4 symbols, each having the symbol power $P_i$ of:

```
\begin{array}{c|c|c|c|c|c}
\text{Symbol} & 0 & 1 & 2 & 3 & P_i \\
\hline
P_i & 1 & 1 & 1 & 1 & \frac{1}{4}
\end{array}
```

16. Consider a source with 4 symbols, each having the symbol power $P_i$ of:

```
\begin{array}{c|c|c|c|c|c}
\text{Symbol} & 0 & 1 & 2 & 3 & P_i \\
\hline
P_i & 1 & 1 & 1 & 1 & \frac{1}{4}
\end{array}
```

17. Consider a source with 4 symbols, each having the symbol power $P_i$ of:

```
\begin{array}{c|c|c|c|c|c}
\text{Symbol} & 0 & 1 & 2 & 3 & P_i \\
\hline
P_i & 1 & 1 & 1 & 1 & \frac{1}{4}
\end{array}
```

18. Consider a source with 4 symbols, each having the symbol power $P_i$ of:

```
\begin{array}{c|c|c|c|c|c}
\text{Symbol} & 0 & 1 & 2 & 3 & P_i \\
\hline
P_i & 1 & 1 & 1 & 1 & \frac{1}{4}
\end{array}
```