

Data Representation: Fractions

We need to represent fractions because _____

There are _____ to integer representation:

1 - _____ → _____

2 - _____ → _____

We will discuss two fractional representations:

1 - _____, 2 - _____

Fixed Point

Fixed Point ⇄ Decimal

Convert the following 4 + 4 fixed point binary number to decimal: 11001100

1 1 0 0 . 1 1 0 0

+ + + + + + +

+ + + + + + +

Convert the following 3 + 5 fixed point binary number to decimal: 10100100

1 0 1 . 0 0 1 0 0

+ + + + + + +

+ + + + + + +

Decimal ⇨ Fractional Binary / Fixed Point

Convert the following decimal number to 4 + 4 binary fixed point: 6.625

6 =

.625 =

+ + + + + + +

+ + + + + + +

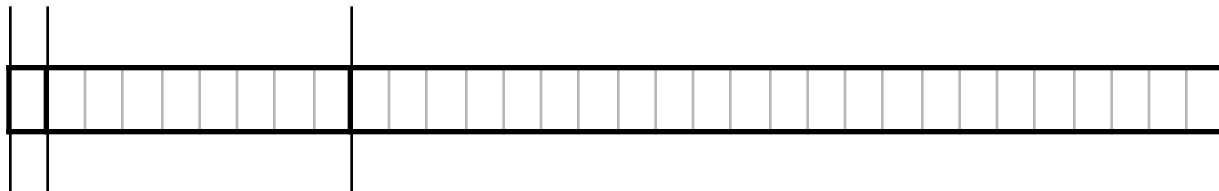
After binary point:

The diagram illustrates the construction of a Huffman tree through six steps. Each step is represented by a row of vertical lines (nodes) and horizontal lines (edges) connecting them. The process begins with 11 individual nodes and proceeds by merging the two smallest nodes at each step until a single root node is formed.

- Step 1:** 11 individual nodes are shown.
- Step 2:** The two smallest nodes are merged into a parent node.
- Step 3:** The next two smallest nodes are merged into a parent node.
- Step 4:** The next two smallest nodes are merged into a parent node.
- Step 5:** The next two smallest nodes are merged into a parent node.
- Step 6:** The final two nodes (which are themselves the roots of subtrees) are merged into the final root node.

Floating Point

3 Fields



3 Special Cases

1 - _____ → _____

→ _____



2 - _____ → _____

→ _____



2 - _____ → _____

→ _____

3- _____

