Data Representation: Fractions

We need to represent fractions because ____

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There are ______________________________ to integer representation:

1 - _______________ ➔ ______________________________

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2 - _______________ ➔ ______________________________

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We will discuss two fractional representations:

1 - ______________________, 2 - ______________________

Fixed Point

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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:

                                              _____ _____ _____ _____ . _____ _____ _____ _____
```

```
Convert the decimal number 5.2 to fractional binary:


                           _____ _____ _____ . _____ _____ _____ _____ _____ _____
                __________________________________|     |     |     |     |     |
               |                                        |     |     |     |     |

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   ____________________|                                |     |     |     |     |
  |             ________________________________________|     |     |     |     |
  |            |                                              |     |     |     |

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   ____________________|                                      |     |     |     |
  |             ______________________________________________|     |     |     |
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   ____________________|                                            |     |     |
  |             ____________________________________________________|     |     |
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   ____________________|                                                  |     |
  |             __________________________________________________________|     |
  |            |                                                                |

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   ____________________|                                                        |
  |             ________________________________________________________________|
  |            |
```
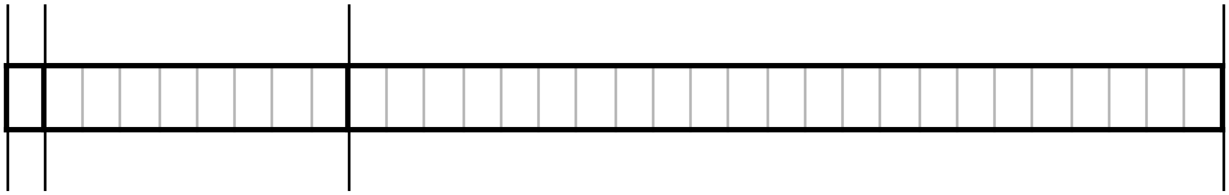

Floating Point

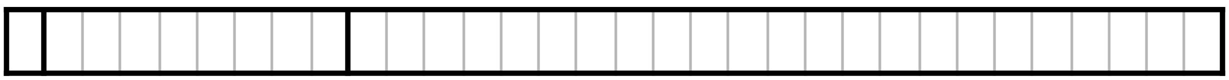
3 Fields



3 Special Cases

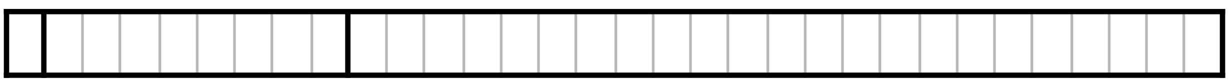
1 - ______________________ → ____

→ ____



2 - ______________________ → ____

→ ____



2 - ______________________ → ____

→ ____

3- ____