

calc_binary_example

Student Group

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\color{black}{ } & \color{black}{128} & \color{black}{64} & \color{black}{32} & \color{black}{16}
& \color{black}{8} & \color{black}{4} & \color{black}{2} & \color{black}{1} \\ \color{blue
}{\text{digits}:} & \color{blue}{z_i} & \color{blue}{1} & \color{blue}{0} & \color{blue}{0} &
\color{blue}{1} & \color{blue}{1} & \color{blue}{1} & \color{blue}{0} & \color{blue}{1} \\
\color{white}{\text{place value}:} & \color{white}{z_i \cdot B^i} & \color{white}{128} &
\color{white}{0} & \color{white}{0} & \color{white}{16} & \color{white}{8} & \color{white}{4} &
\color{white}{0} & \color{white}{1} \\ \color{white}{\text{result}:} & \color{white}{\sum_i z_i
\cdot B^i} & & & \color{white}{157} \\ \end{smallmatrix} \end{align*}
```

5. calculate the place value

\$\quad\$

```
\begin{align*} \begin{smallmatrix} \color{black}{\text{numeral}:} & \color{black}{ } &
\color{black}{1} & \color{black}{0} & \color{black}{0} & \color{black}{1} & \color{black}{1} &
\color{black}{1} & \color{black}{0} & \color{black}{1} \\ \color{blue}{\text{index}:} &
\color{black}{i} & \color{black}{7} & \color{black}{6} & \color{black}{5} & \color{black}{4} &
\color{black}{3} & \color{black}{2} & \color{black}{1} & \color{black}{0} \\
\color{black}{\text{place factor}:} & \color{black}{B^i} & \color{black}{2^7} &
\color{black}{2^6} & \color{black}{2^5} & \color{black}{2^4} & \color{black}{2^3} &
\color{black}{2^2} & \color{black}{2^1} & \color{black}{2^0} \\ \color{white}{ } &
\color{black}{128} & \color{black}{64} & \color{black}{32} & \color{black}{16} &
\color{black}{8} & \color{black}{4} & \color{black}{2} & \color{black}{1} \\
\color{black}{\text{digits}:} & \color{black}{z_i} & \color{black}{1} & \color{black}{0} &
\color{black}{0} & \color{black}{1} & \color{black}{1} & \color{black}{1} & \color{black}{0} &
\color{black}{1} \\ \color{blue}{\text{place value}:} & \color{blue}{z_i \cdot B^i} & \color{blue}{
128} & \color{blue}{0} & \color{blue}{0} & \color{blue}{16} & \color{blue}{8} &
\color{blue}{4} & \color{blue}{0} & \color{blue}{1} \\ \color{white}{\text{result}:} &
\color{white}{\sum_i z_i \cdot B^i} & & & \color{white}{157} \\ \end{smallmatrix} \end{align*}
```

6. Add all place values

\$\quad\$

```
\begin{align*} \begin{smallmatrix} \color{black}{\text{numeral}:} & \color{black}{ } &
\color{black}{1} & \color{black}{0} & \color{black}{0} & \color{black}{1} & \color{black}{1} &
\color{black}{1} & \color{black}{0} & \color{black}{1} \\ \color{blue}{\text{index}:} &
\color{black}{i} & \color{black}{7} & \color{black}{6} & \color{black}{5} & \color{black}{4} &
\color{black}{3} & \color{black}{2} & \color{black}{1} & \color{black}{0} \\
\color{black}{\text{place factor}:} & \color{black}{B^i} & \color{black}{2^7} &
\color{black}{2^6} & \color{black}{2^5} & \color{black}{2^4} & \color{black}{2^3} &
\color{black}{2^2} & \color{black}{2^1} & \color{black}{2^0} \\ \color{white}{ } &
\color{black}{128} & \color{black}{64} & \color{black}{32} & \color{black}{16} &
\color{black}{8} & \color{black}{4} & \color{black}{2} & \color{black}{1} \\
\color{black}{\text{digits}:} & \color{black}{z_i} & \color{black}{1} & \color{black}{0} &
\color{black}{0} & \color{black}{1} & \color{black}{1} & \color{black}{1} & \color{black}{0} &
\color{black}{1} \\ \color{black}{\text{place value}:} & \color{black}{z_i \cdot B^i} & \color{black}{
128} & \color{black}{0} & \color{black}{0} & \color{black}{16} & \color{black}{8} &
\color{black}{4} & \color{black}{0} & \color{black}{1} \\ \color{blue}{\text{result}:} &
\color{blue}{\sum_i z_i \cdot B^i} & & & \color{blue}{157} \\ \end{smallmatrix} \end{align*}
```

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