

# Relational algebra for databases

Álvaro Fernández Barrero

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## 1 Decimal $\rightarrow$ binary

$$100_{(10)} = 1100100_{(2)}$$

$$30_{(10)} = 11110_{(2)}$$

$$500_{(10)} = 111110100_{(2)}$$

$$251_{(10)} = 11111011_{(2)}$$

## 2 Decimal $\rightarrow$ hexadecimal

$$100_{(10)} = 64_{(16)}$$

$$30_{(10)} = 1E_{(16)}$$

$$500_{(10)} = 1F4_{(16)}$$

$$251_{(10)} = FB_{(16)}$$

## 3 Decimal $\rightarrow$ octal

$$100_{(10)} = 144_{(8)}$$

$$30_{(10)} = 24_{(8)}$$

$$500_{(10)} = 764_{(8)}$$

$$251_{(10)} = 373_{(8)}$$

## 4 Binary $\rightarrow$ decimal

$$\sigma_{(2)} = 1100100_{(2)} = \sum_{\lambda=0}^6 \sigma_{\lambda} 10^{\lambda} = 2^2 + 2^5 + 2^6 = 100_{(10)}$$

$$\sigma_{(2)} = 11110_{(2)} = \sum_{\lambda=0}^4 \sigma_{\lambda} 10^{\lambda} = 2 + 2^2 + 2^3 + 2^4 = 30_{(10)}$$

$$\sigma_{(2)} = 111110100_{(2)} = \sum_{\lambda=0}^8 \sigma_{\lambda} 10^{\lambda} = 2^2 + 2^4 + 2^5 + 2^6 + 2^7 + 2^8 = 500_{(10)}$$

$$\sigma_{(2)} = 11111011_{(2)} = \sum_{\lambda=0}^7 \sigma_{\lambda} 10^{\lambda} = 1 + 2 + 2^4 + 2^4 + 2^5 + 2^6 + 2^7 = 251_{(10)}$$

## 5 Binary $\rightarrow$ hexadecimal

$$1100100_{(2)} = 64_{(16)}$$

$$11110_{(2)} = 1E_{(16)}$$

$$111110100_{(2)} = 1F4_{(16)}$$

$$11111011_{(2)} = FB_{(16)}$$

## 6 Binary $\rightarrow$ octal

$$1100100_{(2)} = 144_{(8)}$$

$$11110_{(2)} = 36_{(8)}$$

$$111110100_{(2)} = 764_{(8)}$$

$$11111011_{(2)} = 373_{(8)}$$

## 7 Hexadecimal $\rightarrow$ decimal

$$64_{(16)} = 1100100_{(2)} = \sum_{\lambda=0}^6 \sigma_{\lambda} 10^{\lambda} = 2^2 + 2^5 + 2^6 = 100_{(10)}$$

$$1E_{(16)} = 11110_{(2)} = \sum_{\lambda=0}^4 \sigma_{\lambda} 10^{\lambda} = 2 + 2^2 + 2^3 + 2^4 = 30_{(10)}$$

$$1F4_{(16)} = 111110100_{(2)} = \sum_{\lambda=0}^8 \sigma_{\lambda} 10^{\lambda} = 2^2 + 2^4 + 2^5 + 2^6 + 2^7 + 2^8 = 500_{(10)}$$

$$FB_{(16)} = 11111011_{(2)} = \sum_{\lambda=0}^7 \sigma_{\lambda} 10^{\lambda} = 1 + 2 + 2^4 + 2^4 + 2^5 + 2^6 + 2^7 = 251_{(10)}$$

## 8 Hexadecimal $\rightarrow$ binary

$$64_{(16)} = 1100100_{(2)}$$

$$1E_{(16)} = 11110_{(2)}$$

$$1F4_{(16)} = 11124110100_{(2)}$$

$$FB_{(16)} = 11111011_2$$

## 9 Octal $\rightarrow$ decimal

$$144_{(8)} = 1100100_{(2)} = \sum_{\lambda=0}^6 \sigma_{\lambda} 10^{\lambda} = 2^2 + 2^5 + 2^6 = 100_{(10)}$$

$$36_{(8)} = 11110_{(2)} = \sum_{\lambda=0}^4 \sigma_{\lambda} 10^{\lambda} = 2 + 2^2 + 2^3 + 2^4 = 30_{(10)}$$

$$764_{(8)} = 111110100_{(2)} = \sum_{\lambda=0}^8 \sigma_{\lambda} 10^{\lambda} = 2^2 + 2^4 + 2^5 + 2^6 + 2^7 + 2^8 = 500_{(10)}$$

$$373_{(8)} = 11111011_2 = \sum_{\lambda=0}^7 \sigma_{\lambda} 10^{\lambda} = 1 + 2 + 2^4 + 2^4 + 2^5 + 2^6 + 2^7 = 251_{(10)}$$

## 10 Octal $\rightarrow$ binary

$$144_{(8)} = 1100100_{(2)}$$

$$36_{(8)} = 11110_{(2)}$$

$$764_{(8)} = 111110100_{(2)}$$

$$373_{(8)} = 11111011_2$$

## 11 Text $\rightarrow$ ASCII

$$Alvaro = 65 \ 108 \ 118 \ 97 \ 114 \ 111$$

$$Fernandez = 70 \ 101 \ 114 \ 110 \ 97 \ 110 \ 100 \ 101 \ 122$$

$$Barrero = 66 \ 97 \ 114 \ 144 \ 101 \ 114 \ 111$$

## 12 ASCII $\rightarrow$ text

$$53 \ 69 \ 73 \ 74 \ 65 \ 6D \ 61 \ 73 = Sistemas$$