The matrix of a linear transformation

Eg:- To find the matrix of the linear transformation $T: \mathbb{R}^3 \to \mathbb{R}^2$ given by

$$T(x,y,z) = (x+y+z,\ x+2y+3z)$$

$T(1,0,0) = (1,1) = 1e_1 + 1e_2$

$T(0,1,0) = (1,2) = 1e_1 + 2e_2$

$T(0,0,1) = (1,3) = 1e_1 + 3e_2$

$\Rightarrow$ Matrix of $T = A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & 3 \end{bmatrix}$