Box Filter
The ‘Box’ filter

\[ g[\cdot, \cdot] = \frac{1}{9} \]

replaces pixel with local average

has a smoothing effect
\[ h[m, n] = \sum_{k,l} g[k, l] f[m + k, n + l] \]

* some zero values are white for visualization but they should be black
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\begin{align*}
h[m, n] &= \sum_{k,l} g[k, l] f[m + k, n + l] \\
\end{align*}
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\begin{align*}
\mathbf{h}[m, n] &= \sum_{k,l} \mathbf{g}[k, l] \mathbf{f}[m + k, n + l] \\
\text{output} & \quad \quad \text{filter} \quad \quad \text{image (signal)}
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