To evaluate $\lim_{x\to 0} x\sin\frac{1}{x}$.

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Note that $-1 \le \sin\frac{1}{x} \le 1$, where $x \ne 0$ is in radians.

$-x \le x\sin\frac{1}{x} \le x$

$\lim_{x\to 0}(-x) = \lim_{x\to 0} x = 0$

By squeezing principle, $\lim_{x\to 0} x\sin\frac{1}{x}$ exists and equal to 0 .