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LE10.4

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 Calculator

LE10.4.1: Uncomputable functions

1.0/1.0 point (ungraded)

We saw in lecture that the function $\text{Halts}(k, j)$ which determines whether TM k halts with the argument j is uncomputable. For each of the following functions, describe whether that function is computable or not and compare your reasoning with that of the solutions. Don't worry if you find these questions hard -- just read and think about the provided solutions.

(A) $\text{HaltsBefore}(k, j, s) = 1$ if T_k halts with argument j within s steps, else 0.

☒ Yes, function is computable

☐ No, function is not computable

✓

(B) $\text{HZero}(k)$ which determines whether T_k halts with the argument zero. Hence $\text{HZero}(k)$ returns 1 iff $T_k[0]$ halts, else 0. [HINT: this is tricky].

☐ Yes, function is computable

☒ No, function is not computable

✓

(C) $\text{H12345}(x)$ which determines whether TM 12345 halts with the argument 12345.

☒ Yes, function is computable

☐ No, function is not computable

✓

(D) $\text{Dow}(y) =$ the final value of the Dow Jones average on the last trading day of the year $2000+y$, for $y < 100$ (and zero for $y \geq 100$).

☒ Yes, function is computable

☐ No, function is not computable

✓

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