Let $L = \{\langle M \rangle \mid \exists w \in \Sigma^* \text{ such that when } M \text{ runs on } w,\ M \text{ prints a blank on a non-blank cell}\}$

WTS: L is undecidable
$\implies HALT \leq_{\text{m}} L$

Consider the following TM F and the reudction it computes:
$F =$ "On input $\langle M,\ w \rangle$:

1. Construct a TM M_1 as follows:
$M_1 =$ "On input $\langle M,\ w \rangle$:
1. for $s = 1$ to ∞
2. run M on w for s steps
3. if M writes a blank on a non-blank cell then accept"

2. Construct a TM M_2 as follows:
$M_2 =$ "On input x:
1. $\triangleright$ empty Part1
2. run M_1 on $\langle M,\ w \rangle$
3. accept"

3. return $\langle M_2 \rangle$"

We argue that $\langle M,\ w \rangle \in HALT \iff \langle M_2 \rangle \in L$

($\implies$)
Suppose $\langle M,\ w \rangle \in HALT$

M halts on w	[definition of $HALT$]
$\implies$ M_2 accepts $\langle M,\ w \rangle$ such that M prints a blank in a non-blank cell	[description of M_2]
$\implies$ $\mathcal{L}(M_2) = \{\langle M \rangle \mid \exists w \in \Sigma^* \text{ such that when } M \text{ runs on } w,\ M \text{ prints a blank on a non-blank cell}\}$	
$\implies$ $\langle M_2 \rangle \in L$	[definition of L]

as wanted.

($\impliedby$)
Suppose $\langle M,\ w \rangle \notin HALT$

M loops on w	[definition of $HALT$]
$\implies$ M_2 loops on every input	[description of M_2]
$\implies$ $\mathcal{L}(M_2) \neq \{\langle M \rangle \mid \exists w \in \Sigma^* \text{ such that when } M \text{ runs on } w,\ M \text{ prints a blank on a non-blank cell}\}$	
$\implies$ $\langle M_2 \rangle \notin L$	[definition of L]

as wanted.