Honors HW04. Morally DUE Mon Mar 14

A linear ordering $L$ has the Levin property if the following hold:

- There exists a $MIN$ element.
  Formally
  $$(\exists x)(\forall y)[x \leq y].$$
  In later problems we will call this $x MIN$.

- There exists a $MAX$ element.
  Formally
  $$(\exists y)(\forall x)[x \leq y].$$
  In later problems we will call this $x MAX$.

- For all $y \neq MIN$ there is an element $x$ such that $x < y$ and there is nothing inbetween $x$ and $y$.
  Formally
  $$(\forall y \neq MIN)(\exists x)[x < y \land (\forall z)[(z \leq x) \lor (z \geq y)]].$$

- For all $x \neq MAX$ there is an element $y$ such that $x < y$ and there is nothing inbetween $x$ and $y$.
  Formally
  $$(\forall x \neq MAX)(\exists y)[x < y \land (\forall z)[(z \leq x) \lor (z \geq y)]].$$

1. (50 points) Give an example of an ordering $L$ with the Levin Property such that E wins the Emptier-Filler game with ordering $L$.

2. (50 points) Give an example of an ordering $L$ with the Levin Property such that F wins the Emptier-Filler game with ordering $L$. 