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

  $$(\exists x)(\forall y)[x \le y].$$

  In later problems we will call this x MIN.

- There exists a MAX element.

  Formally

  $$(\exists y)(\forall x)[x \le y].$$

  In later problems we will call this x MAX.

- For all $y \ne MIN$ there is an element x such that $x < y$ and there is nothing inbetween x and y.

  Formally

  $$(\forall y \ne MIN)(\exists x)[x < y \wedge (\forall z)[(z \le x) \vee (z \ge y)]].$$

- For all $x \ne MAX$ there is an element y such that $x < y$ and there is nothing inbetween x and y.

  Formally

  $$(\forall x \ne MAX)(\exists y)[x < y \wedge (\forall z)[(z \le x) \vee (z \ge y)]].$$

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.