Algorithm 1: A pseudocode of the execution process of the virtual environment.

Input: The size of the grid s,
The size of population N,
Number of infectious population M,
Number of days staying exposed E_t,
Number of days staying infectious I_t,
Number of daily movements M_t,
Number of days D

$S \leftarrow \{(x, y, d) \in \mathbb{N} | 0 \leq x, y \leq s \; and \; d = 0\} \quad and \quad |S| = N - M$; `/* susceptible population */`
$E \leftarrow \{\}$; `/* exposed population */`
$I \leftarrow \{(x, y, d) \in \mathbb{N} | 0 \leq x, y \leq s \; and \; d = 0\} \quad and \quad |I| = M$; `/* infectious population */`
$R \leftarrow \{\}$; `/* recovered population */`
$P \leftarrow S \cup E \cup I \cup R$; `/* total population */`
$Economy \leftarrow 0$; `/* total economic transaction */`
`/* loop for each day */`
for $day \leftarrow 1$ **to** D **do**
    `/* loop for each step */`
    for $m_t \leftarrow 1$ **to** M_t **do**
        `/* loop for each person */`
        for $p \in P$ **do**
            `/*` $\mathbb{Z} \cap [-1, 1]$ `defines picking a random integer from -1, 0, and 1 */`
            $x_t \leftarrow max(min(p(x) + \mathbb{Z} \cap [-1, 1], s), 0)$; `/* making valid movements in the grid */`
            $y_t \leftarrow max(min(p(y) + \mathbb{Z} \cap [-1, 1], s), 0)$;
            $z_t \leftarrow p(z) + 1$; `/* updating the day counter */`
            `/* if the person is in recovered state */`
            if $p \in R$ **then**
                $P \leftarrow (P - p) \cup \{(x_t, y_t, 0)\}$; `/* no state upates for recovered population */`
            `/* if the person is in infectious state */`
            else if $p \in I$ **then**
                `/*` $\mathbb{N} \cap [0, 7]$ `defines picking a random integer in range [0, 7] */`
                if $z_n - \mathbb{N} \cap [0, 7] \geq I_t$ **then**
                    `/* randomly choose if a person survives, and the probability distribution of choosing 1 over 0 is 1:5 */`
                    if $\mathbb{N} \cap [0, 1] = 1$ **then**
                        $P \leftarrow P - p$; `/* dead person are removed from the states */`
                    else
                        $R \leftarrow R \cup \{(x_t, y_t, 0)\}$; `/* recovered person is moved to recovered state */`
                        $P \leftarrow (P - p) \cup \{(x_t, y_t, 0)\}$;
                    $I \leftarrow I - p$;
                else
                    $P \leftarrow (P - p) \cup \{(x_t, y_t, z_t)\}$;
                    $I \leftarrow (I - p) \cup \{(x_t, y_t, z_t)\}$;
            `/* if the person is in exposed state */`
            else if $p \in E$ **then**
                `/*` $\mathbb{N} \cap [1, 2]$ `defines picking a random integer 1 or 2 */`
                if $z_n - \mathbb{N} \cap [1, 2] \geq E_t$ **then**
                    $E \leftarrow E - p$;
                    $I \leftarrow I \cap \{(x_t, y_t, 0)\}$;
                    $P \leftarrow (P - p) \cup \{(x_t, y_t, 0)\}$;
                else
                    $E \leftarrow (E - p) \cup \{(x_t, y_t, z_t)\}$;
                    $P \leftarrow (P - p) \cup \{(x_t, y_t, z_t)\}$;
            `/* if the person is in susceptible state */`
            else
                `/* check if the person is in close contact with any of the infectious person */`
                if $(x_n + [-1, 1], y_n + [-1, 1], \mathbb{N}) \in I$ **then**
                    $I \leftarrow I \cup \{x_t, y_y, 0\}$; `/* move the person in exposed state */`
                    $P \leftarrow (P - p) \cup \{(x_t, y_t, 0)\}$;
                else
                    $P \leftarrow (P - p) \cup \{(x_t, y_t, z_t)\}$
            `/* except of the person is not infectous (and not dead) he/she contributes to the economy */`
            if $p \notin I$ **then**
                $Economy \leftarrow Economy + \mathbb{R} \cap [0.8, 1]$;