$$\frac{1}{1} \qquad \frac{1}{2} \qquad \frac{1}{3} \qquad \frac{1}{4} \qquad \frac{1}{5} \qquad \bullet \ \bullet \ \bullet$$

$$\frac{2}{1} \qquad \frac{2}{2} \qquad \frac{2}{3} \qquad \frac{2}{4} \qquad \frac{2}{5}$$

$$\frac{3}{1} \qquad \frac{3}{2} \qquad \frac{3}{3} \qquad \frac{3}{4} \qquad \frac{3}{5}$$

$$\frac{4}{1} \qquad \frac{4}{2} \qquad \frac{4}{3} \qquad \frac{4}{4} \qquad \frac{4}{5}$$

$$\frac{5}{1} \qquad \frac{5}{2} \qquad \frac{5}{3} \qquad \frac{5}{4} \qquad \frac{5}{5}$$

$$\bullet \ \bullet \ \bullet$$
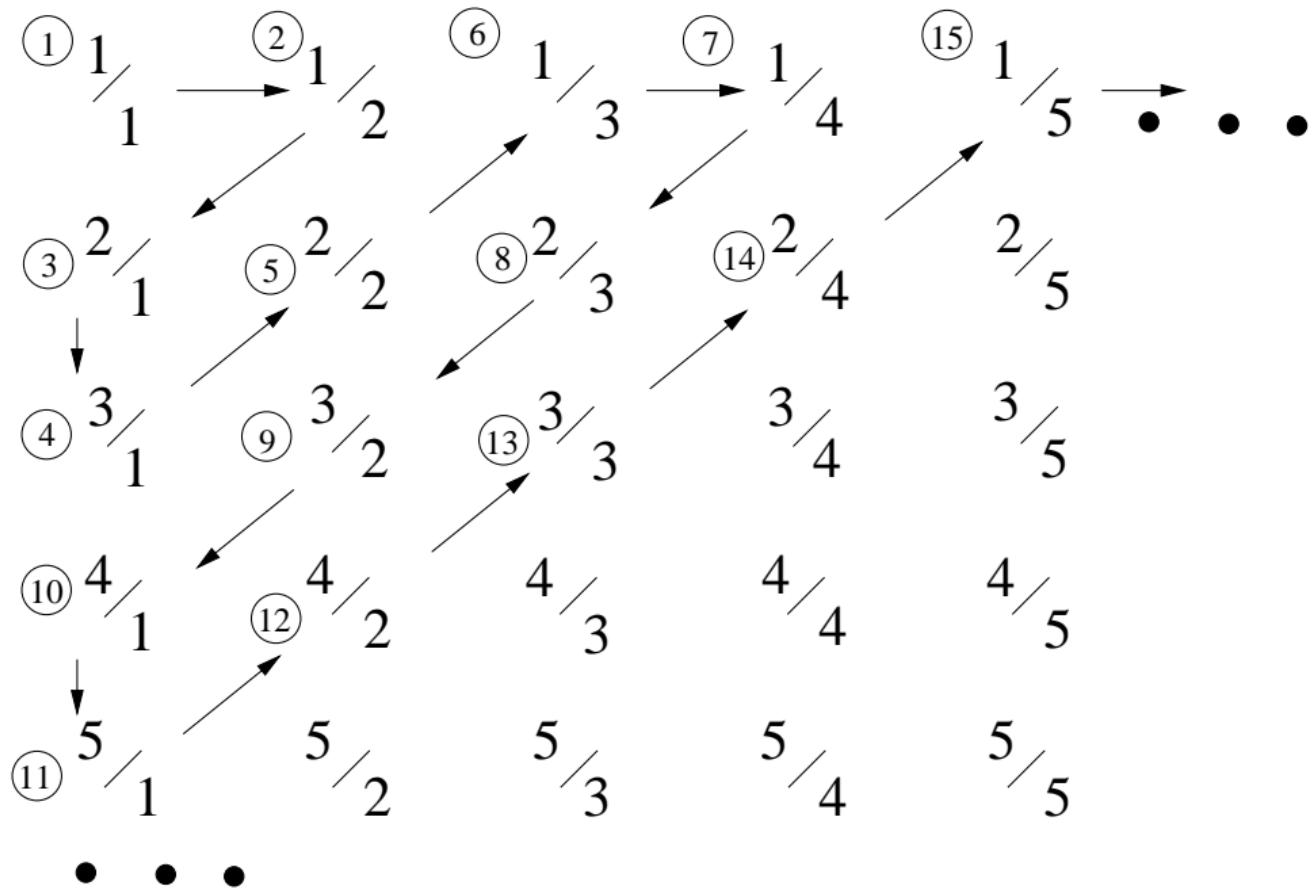
```sml
fun findRoom(busNum, seatNum) =
  let
    fun nextPair(a, b) =
      if a = 1 andalso b mod 2 = 1 then (1, b + 1)
      else if b = 1 andalso a mod 2 = 0
           then (a + 1, 1)
      else if (a + b) mod 2 = 1 then (a + 1, b - 1)
      else (a - 1, b + 1);
    fun findRoomHelper(i, currentPair) =
      if currentPair <> (busNum, seatNum)
      then findRoomHelper(i + 1, nextPair(currentPair))
      else i;
  in
    findRoomHelper(1, (1, 1))
end;
```

```
fun findBusSeat(room) =
  let
    fun nextPair(a, b) =
      if a = 1 andalso b mod 2 = 1 then (1, b + 1)
      else if b = 1 andalso a mod 2 = 0
           then (a + 1, 1)
      else if (a + b) mod 2 = 1 then (a + 1, b - 1)
      else (a - 1, b + 1);
    fun findBusSeatHelper(i, currentPair) =
      if i <> room
      then findBusSeatHelper(i + 1,
                             nextPair(currentPair))
      else currentPair;
  in
    findBusSeatHelper(1, (1, 1))
  end;
```

① $1/1$ → ② $1/2$ ⑤ $1/3$ → ⑥ $1/4$ ⑪ $1/5$ → • • •

③ $2/1$ $2/2$ ⑦ $2/3$ $2/4$ $2/5$

④ $3/1$ ⑧ $3/2$ $3/3$ $3/4$ $3/5$

⑨ $4/1$ $4/2$ $4/3$ $4/4$ $4/5$

⑩ $5/1$ $5/2$ $5/3$ $5/4$ $5/5$

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