

```

(*states[f_List, r_List, output_:{}]:*)
states[{}, r_List, output_] := Return[output];
states[f_List, r_List, output_:{}] :=
Module[{a = 8, b = 5, c = 3, r1, f1, p, x, y, z, graph = {}, ou},
  r1 = r; f1 = f;

  x = f1[[1, 1]]; y = f1[[1, 2]]; z = f1[[1, 3]];

  If[x > 0,
    If[x > b - y,
      p = {x + y - b, b, z};
      If[MemberQ[r1, p] === False,
        AppendTo[r1, p]; AppendTo[f1, p];
        AppendTo[graph, v[{x, y, z}, p]]
      ], (* Else*)
      p = {0, x + y, z};
      If[MemberQ[r1, p] === False,
        AppendTo[r1, p]; AppendTo[f1, p];
        AppendTo[graph, v[{x, y, z}, p]]
      ]
    ];
  ];

  If[x > 0,
    If[x > c - z,
      p = {x + z - c, y, c};
      If[MemberQ[r1, p] === False,
        AppendTo[r1, p]; AppendTo[f1, p];
        AppendTo[graph, v[{x, y, z}, p]]
      ], (*Else*)
      p = {0, y, x + z};
      If[MemberQ[r1, p] === False,
        AppendTo[r1, p]; AppendTo[f1, p];
        AppendTo[graph, v[{x, y, z}, p]]
      ]
    ];
  ];

  (*Changing y*)
  If[y > 0,
    If[y > a - x,
      If[MemberQ[r1, p] === False,
        AppendTo[r1, p]; AppendTo[f1, p];
        AppendTo[graph, v[{x, y, z}, p]]
      ], (* Else*)
      p = {x + y, 0, z};
      If[MemberQ[r1, p] === False,
        AppendTo[r1, p]; AppendTo[f1, p];
        AppendTo[graph, v[{x, y, z}, p]]
      ]
    ];
  ]

```

```

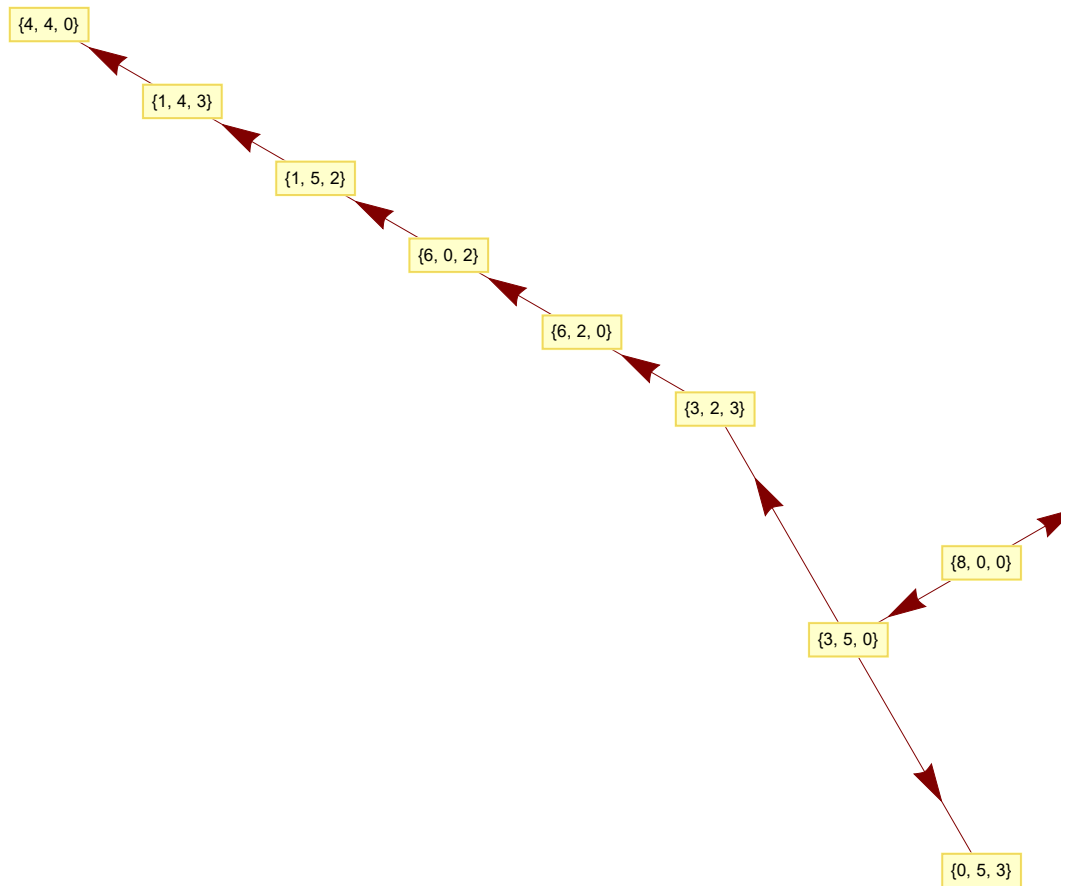
];
If[y > 0,
  If[y > c - z,
    p = {x, y + z - c, c};
    If[MemberQ[r1, p] === False,
      AppendTo[r1, p]; AppendTo[f1, p];
      AppendTo[graph, v[{x, y, z}, p]]
    ], (* Else*)
    p = {x, 0, y + z};
    If[MemberQ[r1, p] === False,
      AppendTo[r1, p]; AppendTo[f1, p];
      AppendTo[graph, v[{x, y, z}, p]]
    ]
  ]
];

(*Changing z*)
If[z > 0,
  If[z > a - x,
    p = {a, y, z + x - a};
    If[MemberQ[r1, p] === False,
      AppendTo[r1, p]; AppendTo[f1, p];
      AppendTo[graph, v[{x, y, z}, p]]
    ], (*Else*)
    p = {x + z, y, 0};
    If[MemberQ[r1, p] === False,
      AppendTo[r1, p]; AppendTo[f1, p];
      AppendTo[graph, v[{x, y, z}, p]]
    ]
  ]
];

If[z > 0,
  If[z > b - y,
    p = {x, b, y + z - b};
    If[MemberQ[r1, p] === False,
      AppendTo[r1, p]; AppendTo[f1, p];
      AppendTo[graph, v[{x, y, z}, p]]
    ], (*Else*)
    p = {x, y + z, 0};
    If[MemberQ[r1, p] === False,
      AppendTo[r1, p]; AppendTo[f1, p];
      AppendTo[graph, v[{x, y, z}, p]]
    ]
  ]
];
ou = Union[output, graph];
states[Delete[f1, 1], r1, ou]
]

```

```
st = states[{{8, 0, 0}}, {{8, 0, 0}}, {}] /.  
  v[{{i_, j_, k_}, {m_, n_, s_}] => {i, j, k} -> {m, n, s};  
GraphPlot[st, VertexLabeling -> True, MultiedgeStyle -> 0.2, DirectedEdges -> True]
```



```
Graph[st, VertexLabels -> "Name", ImageSize -> 450]
```