Cohen SutherLand

```
Find4BitCode[min_List, max_List, point_List] := Module[{x, y, code = {0, 0, 0, 0}},
    {x, y} = point;
    If[y > max[[2]], code[[1]] = 1];
    If[y < min[[2]], code[[2]] = 1];
    If[x > max[[1]], code[[3]] = 1];
    If[x < min[[1]], code[[4]] = 1];
    Return[code];
]
```

```
FindVisiblePart[min_List, max_List, a_List, b_List] := Module[
    {bitCodeA, bitCodeB, slope, newPoint, code, x, y, newA = a, newB = b},
    bitCodeA = Find4BitCode[min, max, a];
    bitCodeB = Find4BitCode[min, max, b];
    While[True,
        If[Total[bitCodeA] == 0 && Total[bitCodeB] == 0, Return[{newA, newB}]];
        If[BitAnd @@ (bitCodeA + bitCodeB) > 0, Return[{}]];
        If[Total[bitCodeA] ≠ 0,
            newPoint = newA; code = bitCodeA,
            newPoint = newB; code = bitCodeB
        ];
        slope = If[b[[1]] ≠ a[[1]], (b[[2]] - a[[2]]) / (b[[1]] - a[[1]]), Infinity];
        If[code[[1]] == 1,
            x = newPoint[[1]] + (max[[2]] - newPoint[[2]]) / slope;
            y = max[[2]];
        ];
        If[code[[2]] == 1,
            x = newPoint[[1]] + (min[[2]] - newPoint[[2]]) / slope;
            y = min[[2]];
        ];
        If[code[[3]] == 1,
            x = max[[1]];
            y = slope * (max[[1]] - newPoint[[1]]) + newPoint[[2]];
        ];
        If[code[[4]] == 1,
            x = min[[1]];
            y = slope * (min[[1]] - newPoint[[1]]) + newPoint[[2]];
        ];
        If[Total[bitCodeA] ≠ 0,
            newA = {x, y}; bitCodeA = Find4BitCode[min, max, newA],
            newB = {x, y}; bitCodeB = Find4BitCode[min, max, newB]
        ];
  ];
]
```

In[114]:=

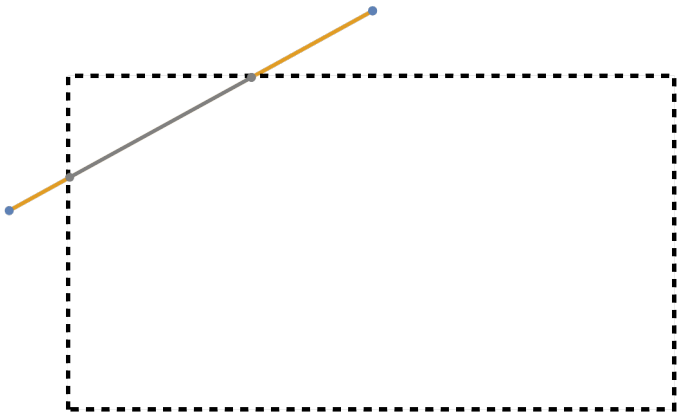
```
DrawClipping[min_List, max_List, a_List, b_List] := Module[{points},
    points = FindVisiblePart[min, max, a, b];
    Show[
        ListPlot[{{a,b},{a,b}}, Joined→{False, True} ],
        Graphics[
            {FaceForm[White],
            Opacity[0.3],
            EdgeForm[Directive[Thick, Dashed, Black]],
            Rectangle[min,max]}
        ],
        ListPlot[{points,points }, Joined→{False, True}, PlotStyle→{Gray ,Gray}],
        PlotRange→All,
        Axes→False
    ]
]
```

In[115]:=

```
min = {0, 0};
max = {10, 10};
a = {-1, 6};
b = {5, 12};

DrawClipping[min,max,a,b]
```

Out[119]=



In[120]:=

```
FindVisiblePart[min, max, a, b]
```

Out[120]=

```
{{0, 7}, {3, 10}}
```