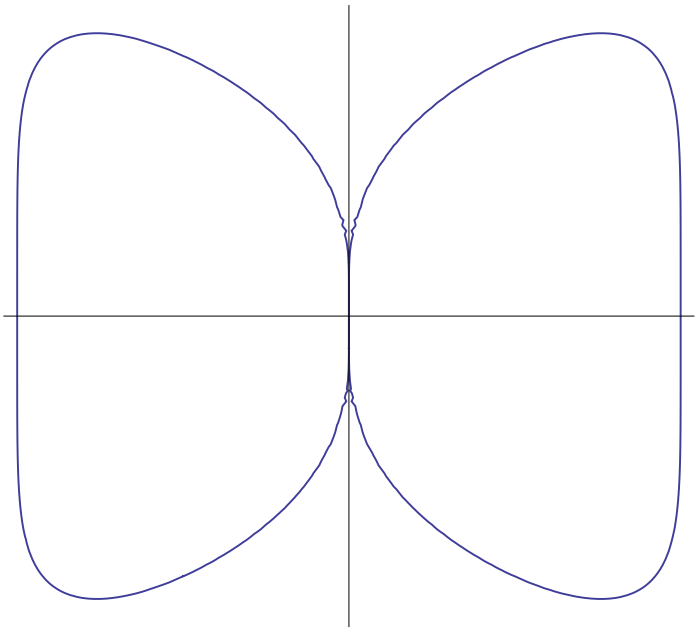
神经网络练习

In[ ]:= **first butterfly curve** PLANE CURVE [*graphic*]

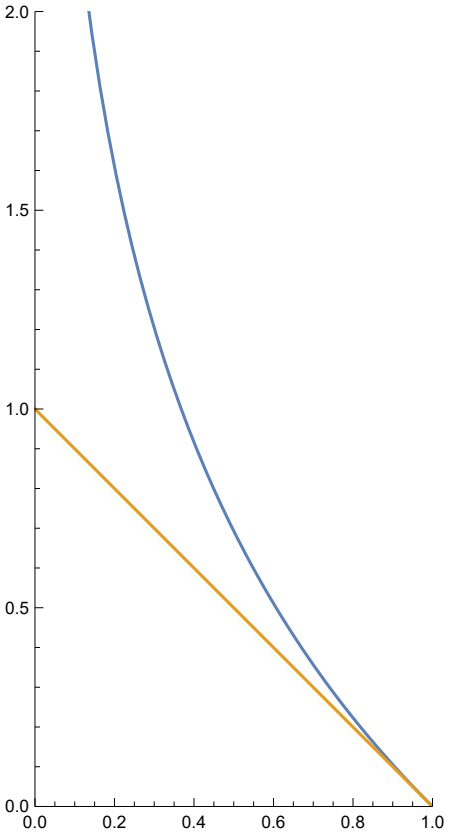
Out[ ]=



交叉熵损失

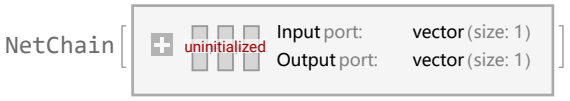
In[ ]:=
```
Plot[{-Log[x], 1 - x}, {x, 0, 1}, PlotRange → {{0, 1}, {0, 2}}, AspectRatio → 2]
```
绘图 对数 绘制范围 宽高比

Out[ ]=



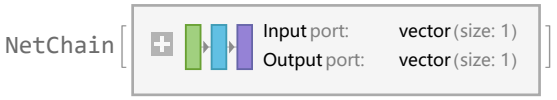
In[ ]:=
```
net = NetChain[{5, Tanh, 1}, "Input" → 1]
```
网络链 双曲正切 输入

Out[ ]=



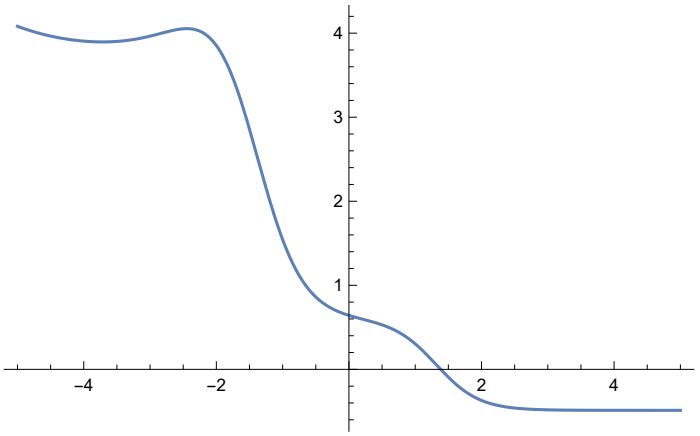
In[ ]:=
```
inet = NetInitialize[net, Method → {"Random", "Biases" → 2}]
```
神经网络初始化 方法

Out[ ]=



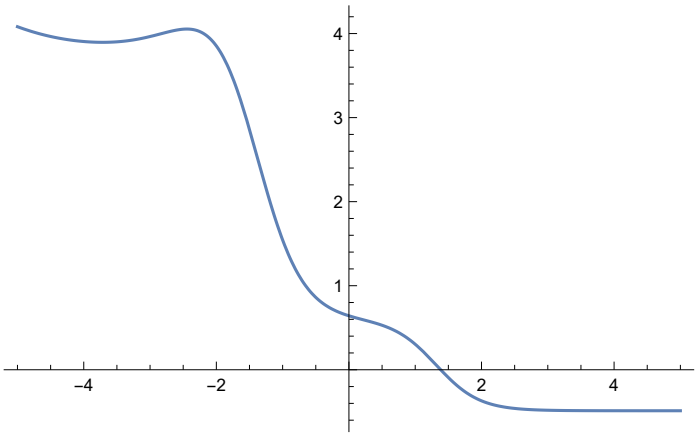
In[ ]:=
```
Plot[inet[x], {x, -5, 5}]
```
绘图

Out[ ]=



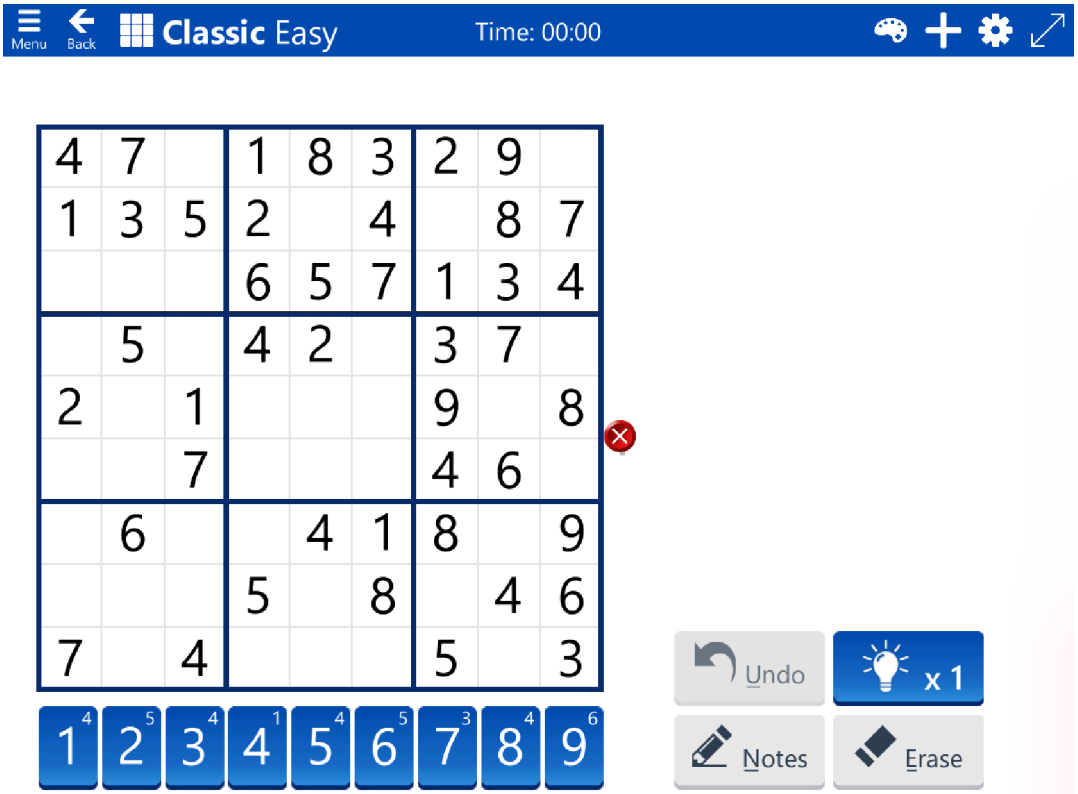
In[ ]:=
```
Plot[inet[x], {x, -5, 5}]
```
绘图

Out[ ]=



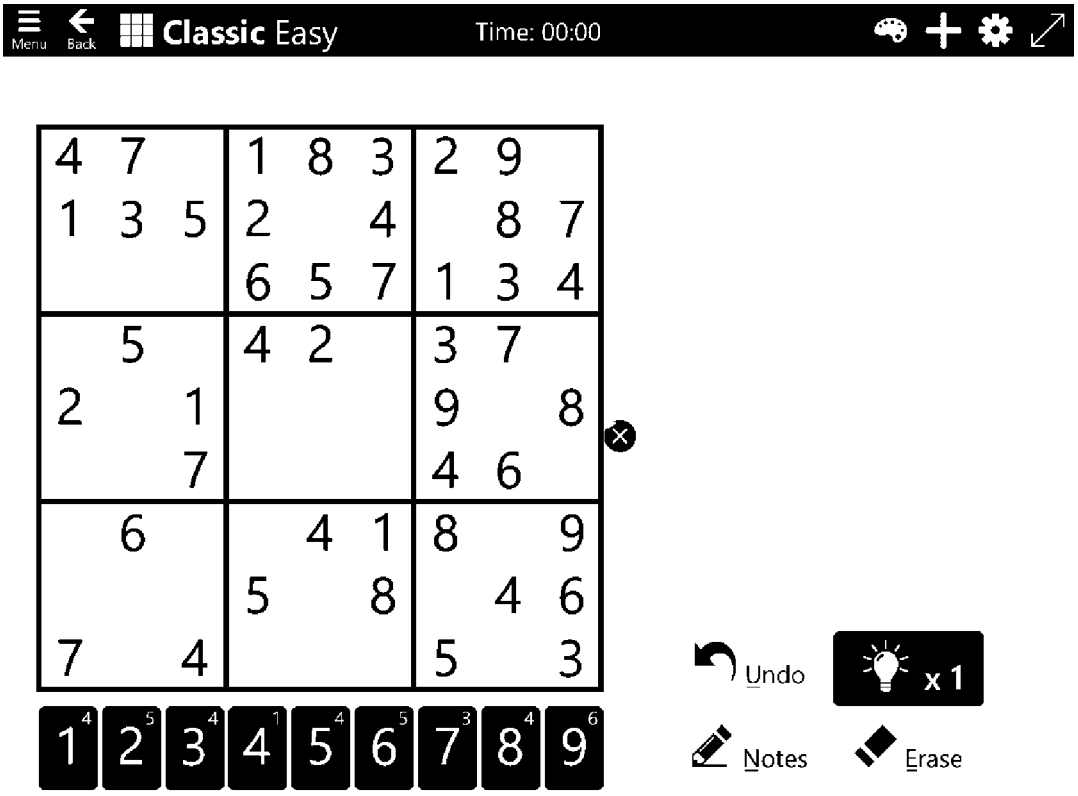
In[ ]:=
```
img = Import["C:\\Users\\HuiLing\\Desktop\\sudoku_001.png"]
```
导入 常量

Out[ ]=



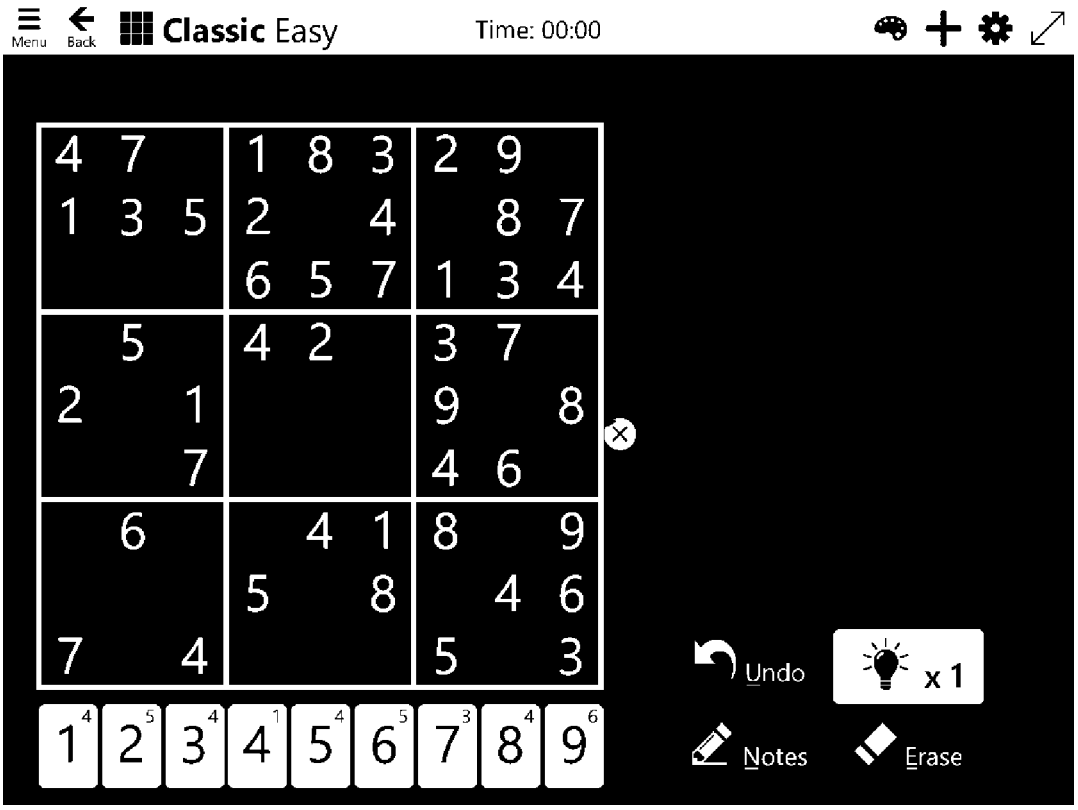
In[ ]:=
```
Binarize[img]
```
二值化

Out[ ]=



In[ ]:=
```
ColorNegate[%41]
```
图像|彩色负片

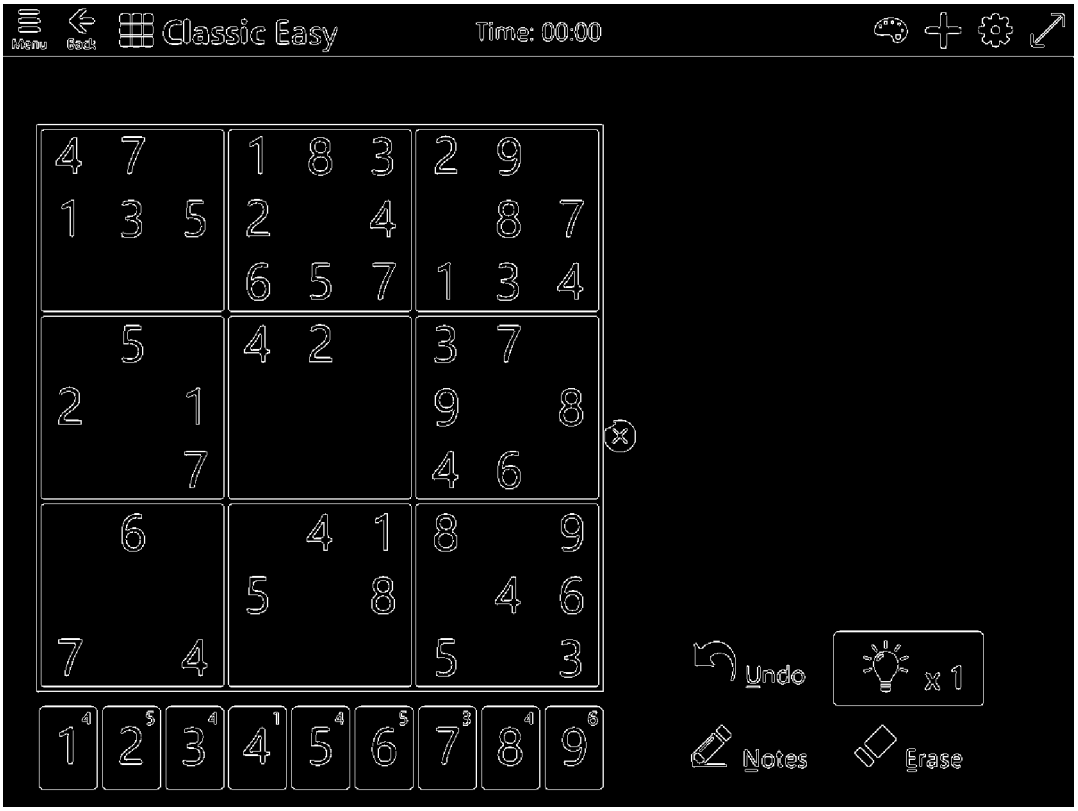
Out[ ]=



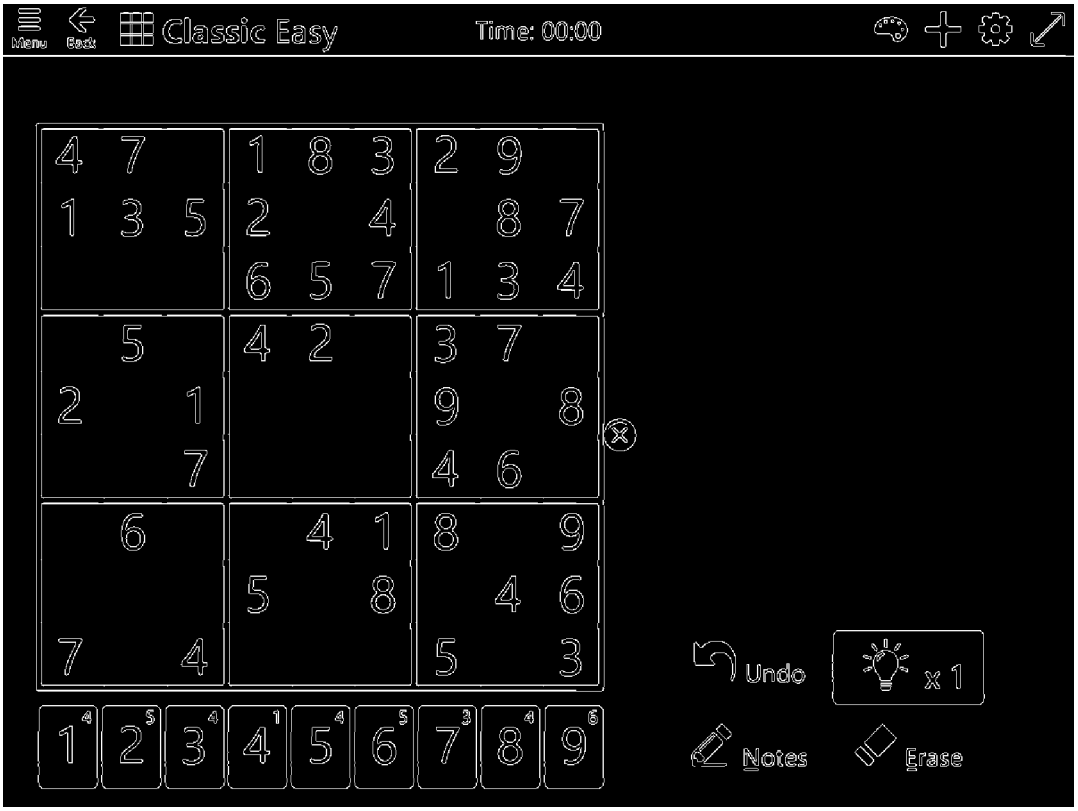
In[ ]:=
```
EdgeDetect[ColorNegate@Binarize@img]
```
边缘检测　图像|彩色负片　二值化

```
EdgeDetect[img]
```
边缘检测

Out[ ]=



Out[ ]=



In[ ]:=
```
EdgeDetect[ColorNegate@Binarize@img, 6, 0.1, Method → {"Canny", "StraightEdges" → 0.1}]
```
边缘检测 图像|彩色负片 二值化 方法

Out[ ]=

In[ ]:=
```
contours = ImageMeasurements[ColorNegate@Binarize@img, "Contours"]
```
图像度量 图像|彩色负片 二值化 等高线

Out[ ]=

```
{Line[{{0, 900}, {0, 841}, {1200, 841}, {1200, 900}, {0, 900}}], ··· 236 ···,
 Line[{{1013, 43}, {1013, 41}, {1024, 41}, {1024, 43}, {1013, 43}}]}
```

大型输出 | 显示更少 | 显示更多 | 显示全部 | 设定大小限制...

找出点数最多的Line，（但并不是想要的结果）

In[ ]:=
```
l = MaximalBy[contours, Length[#[[1]]] &];
```
按需找最大值 长度

```
Length[l[[1, 1]]]
```
长度

Out[ ]=

```
215
```

找出围成区域面积最大的Line，

In[ ]:=
```
s = MaximalBy[contours, Area[Region@Polygon[#[[1]]]] &];
```
按需找最大值 面积 几何区域 多边形

```
Polygon[s[[1, 1]]]
```
多边形

```
Region
```
几何区域

Out[ ]=

Polygon [Number of points: 9
Embedding dimension: 2
Type: degenerated polygon
Bounds: {{17, 41}, {889, 893}}
Area: undefined]

Out[ ]=

```
Region
```

Polygon [Number of points: 137
Embedding dimension: 2
Type: simple polygon
Bounds: {{483, 509}, {287, 329}}
Area: 863]

多边形

In[ ]:=
```
Area[Polygon@contours[[76, 1]]]
```
面积 多边形

Out[ ]=

```
403 860
```

In[ ]:=
```
Polygon@contours[[70, 1]]
```
多边形

Out[ ]=

Polygon [Number of points: 15
Embedding dimension: 2
Type: degenerated polygon
Bounds: {{90, 92}, {852, 857}}
Area: undefined]

In[ ]:=
```
Manipulate[HighlightImage[img, contours[[i]]], {i, 1, Length@contours, 1}]
```
交互式操作 突出显示图像 长度

Out[ ]=

面积