**CV hw9 / 電機所R06921082 陳與賢**

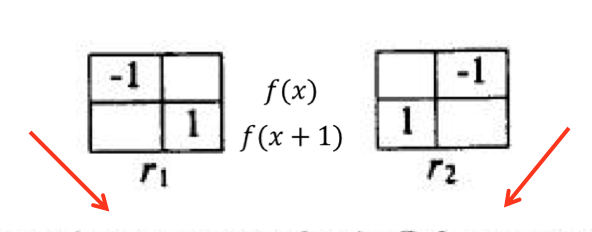
**Description:**

利用python來處理bmp檔，使用各種mask以及threshold來做edge detection。

**Algorithm:**

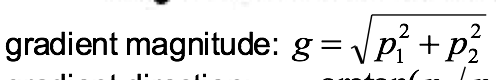
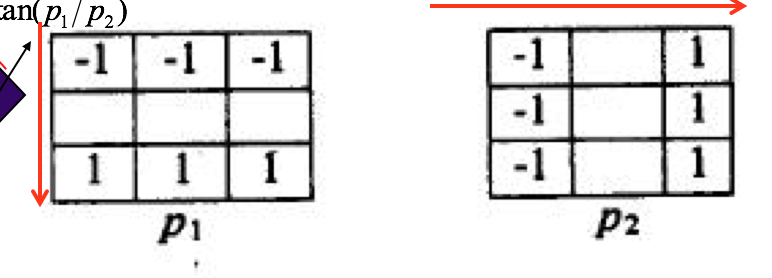
所有operator的mask都是直接用助教ppt上面給的，原本在想要用convolution還是cross-correlation，後來發現助教ppt上給的kernel跟網路上大家用的都是已經『翻轉』過的了，所以就直接用助教給的mask，然後用cross-correlation的方式來算，最後threshold也是直接用助教給的建議值，各個operator的mask如下：

**@Robert’s** **Operator**

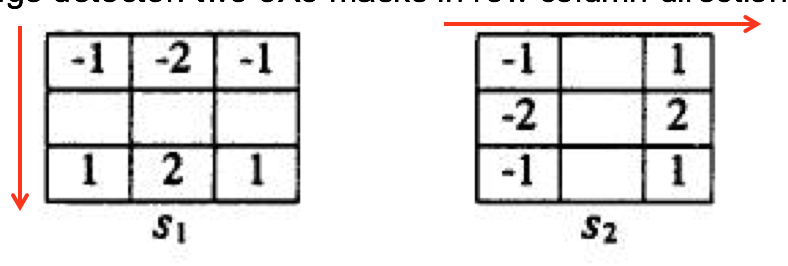


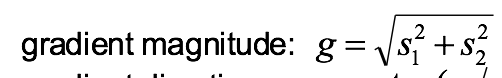


**@Prewitt’s Edge Operator**

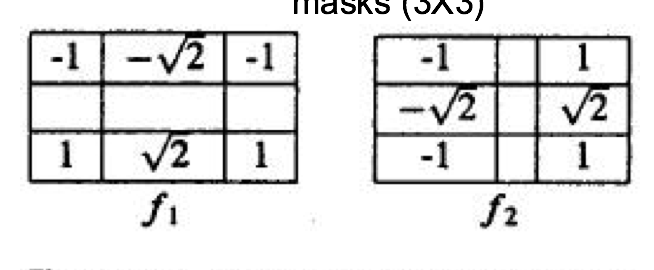
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**@Sobel’s Edge Operator**

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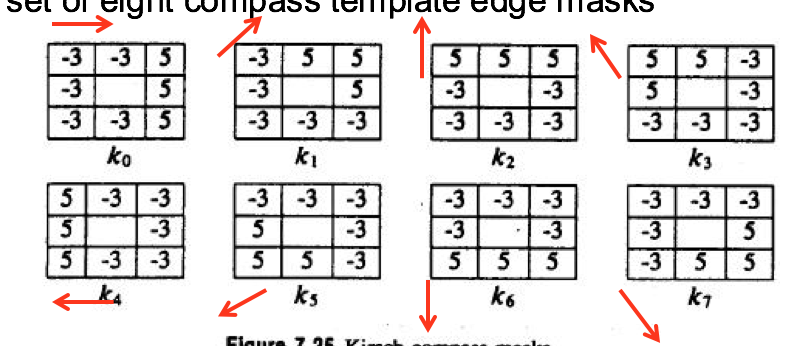
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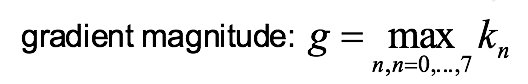
**@Frei and Chen's Gradient Operator**

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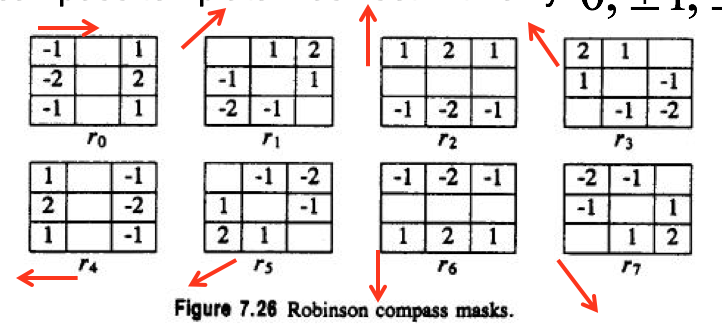
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**@Kirsch's Compass Operator**

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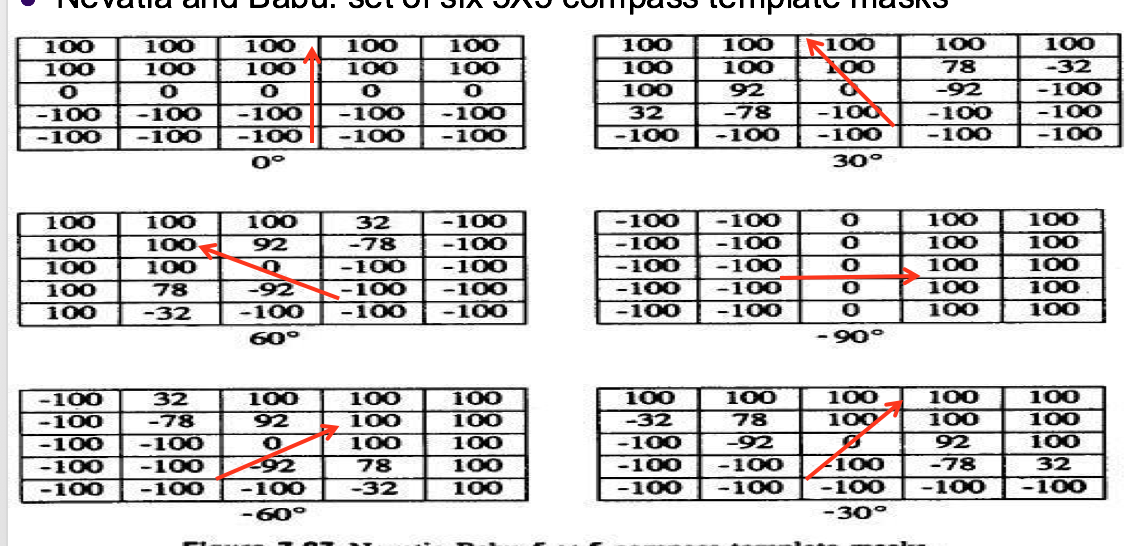
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**@Robinson's Compass Operator**

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**@Nevatia-Babu 5x5 Operator**

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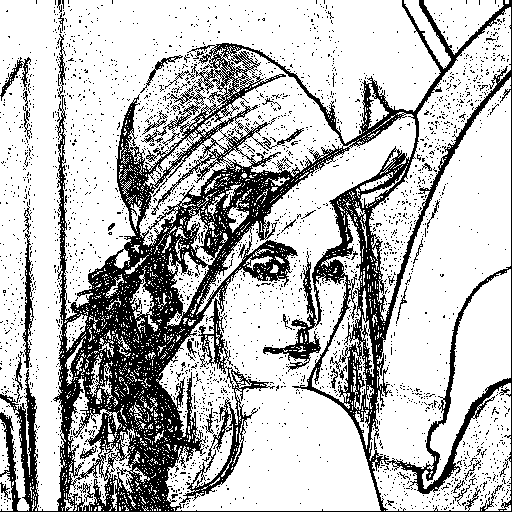
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作法就是用上述的mask算出gradient magnitude，若此值大於threshold，代表我們認為他的變化量夠大到是邊界，因此給值0，反之給值255（白底黑邊）。

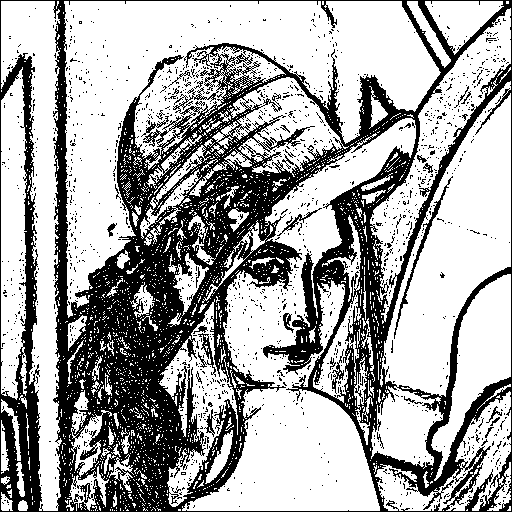
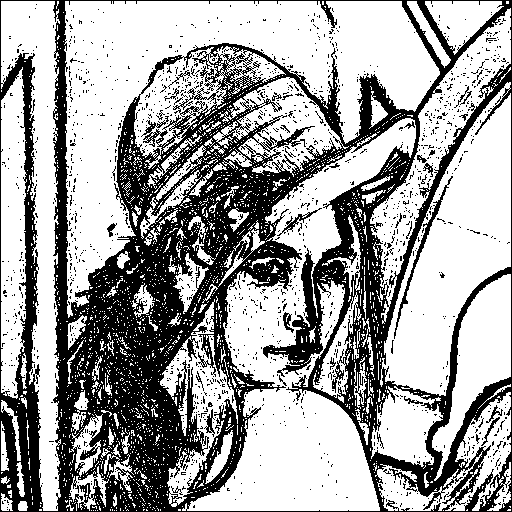
因為演算法算是蠻簡單的…所以就不把code貼上來了。

**Result:**

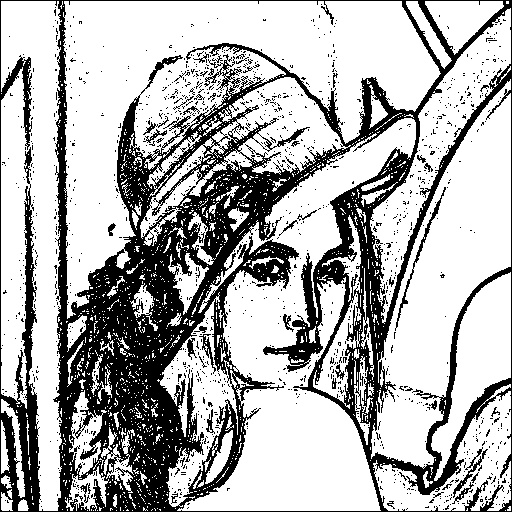
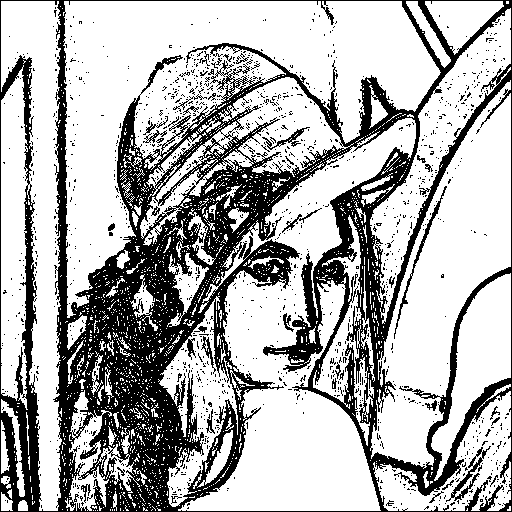
Robert's: 12 Prewitt's: 24

Sobel: 38 Frei and Chen: 30

Kirsch: 135 Robinson: 43

Nevatia: 12500

