•Computer Vision HW1 R10922A16 蔡家豪

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•Part1. Write a program to do the following requirement.

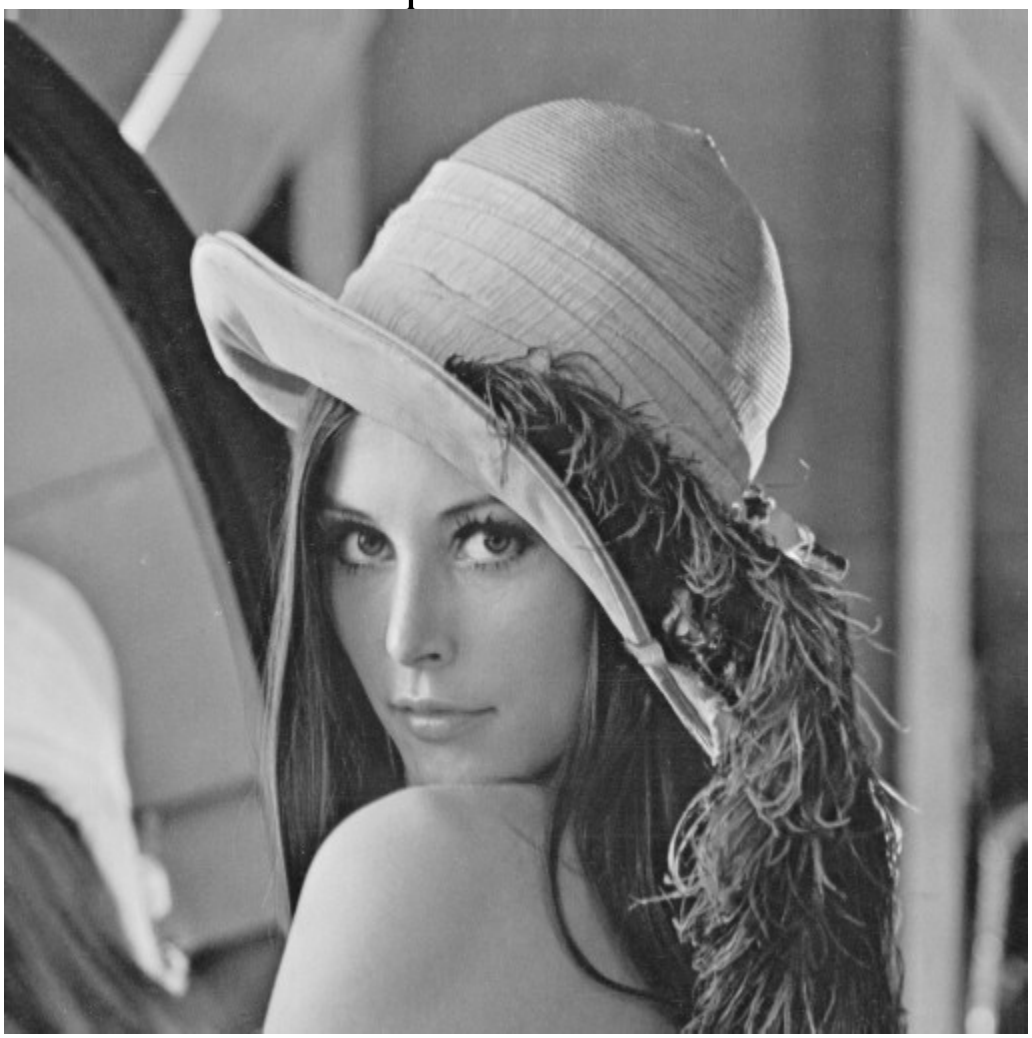
•(a) upside-down lena.bmp

```
void upside_down() {

    for (int i = 0; i < x_half; i++)
        for (int j = 0; j < y; j++)
            swap(img.at<char>(i, j) ,img.at<char>(x - i - 1, j));

}
```

•(b) right-side-left lena.bmp

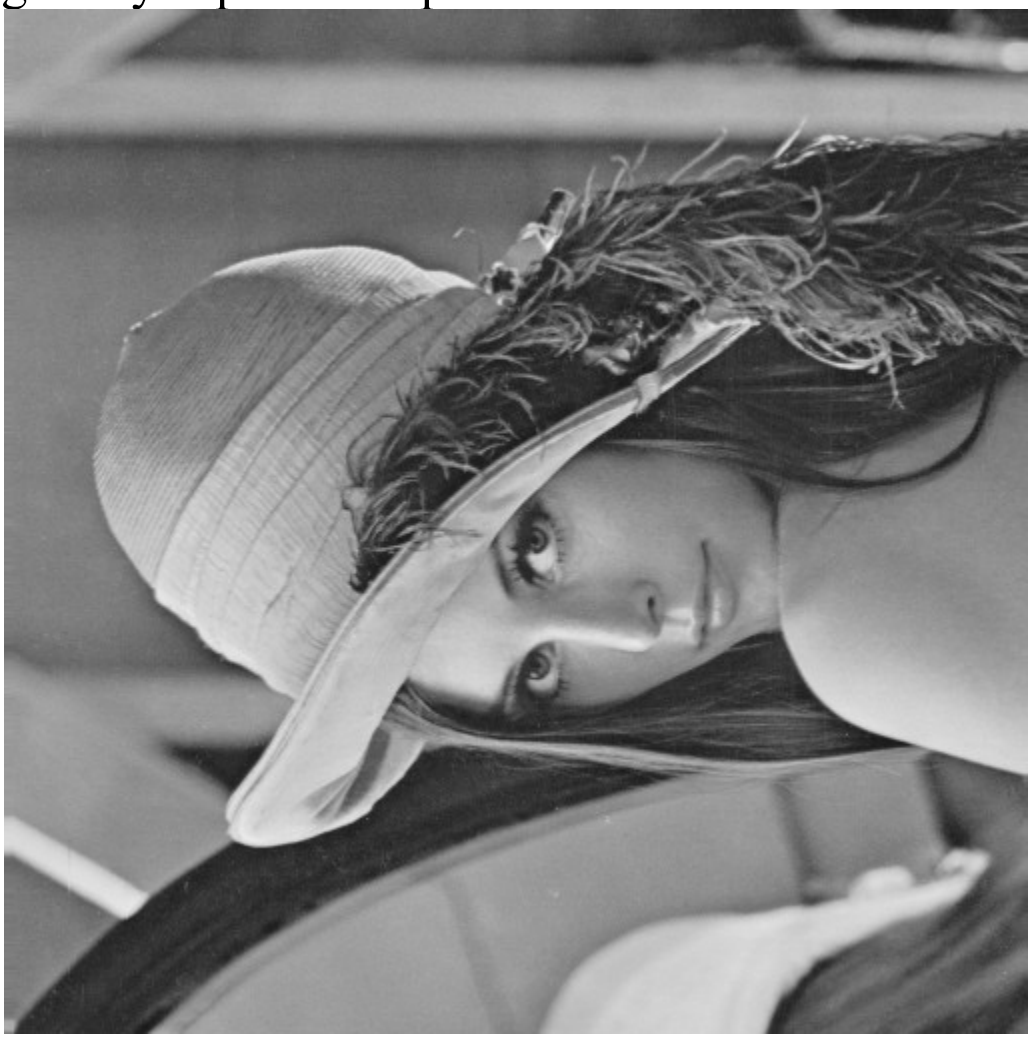


```
void right_side_left() {

    for (int i = 0; i < x; i++)
        for (int j = 0; j < y_half; j++)
            swap(img.at<char>(i, j) ,img.at<char>(i, y - j - 1));

}
```

•(c) diagonally flip lena.bmp

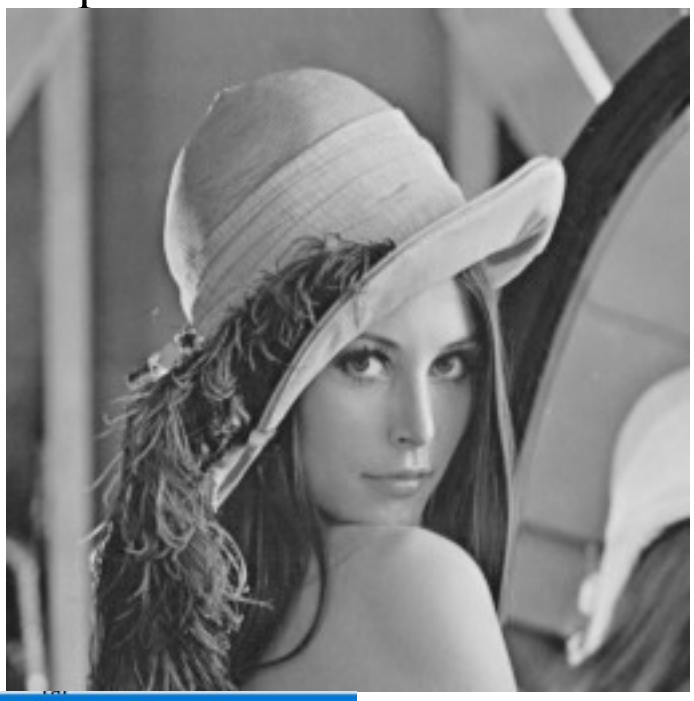


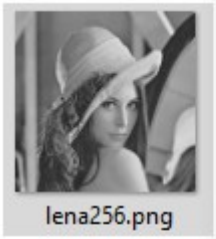
```
void diagonally_flip(){
    for(int i=0;i<x;i++){
        for(int j=0;j<y;j++){
            img.at<char>(i,j)=lena.at<char>(j,i);
        }
    }
}
```

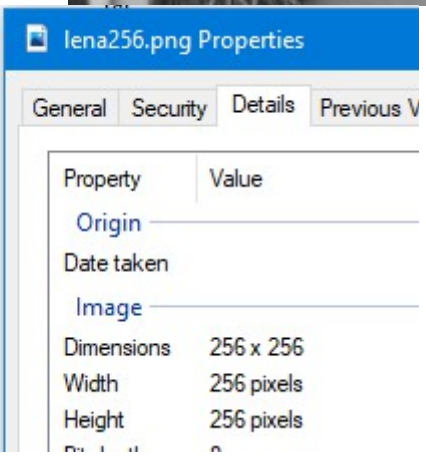
•(d) rotate lena.bmp 45 degrees clockwise

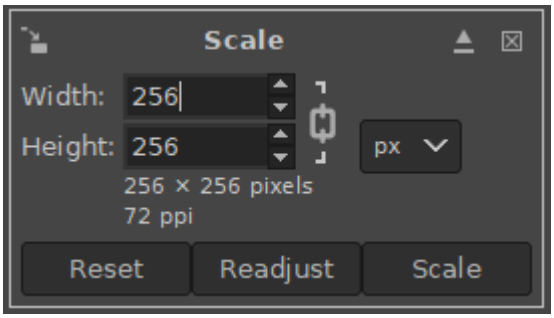
用 gimp 來旋轉 tools->transform tools ->Rotate

•(e) shrink lena.bmp in half



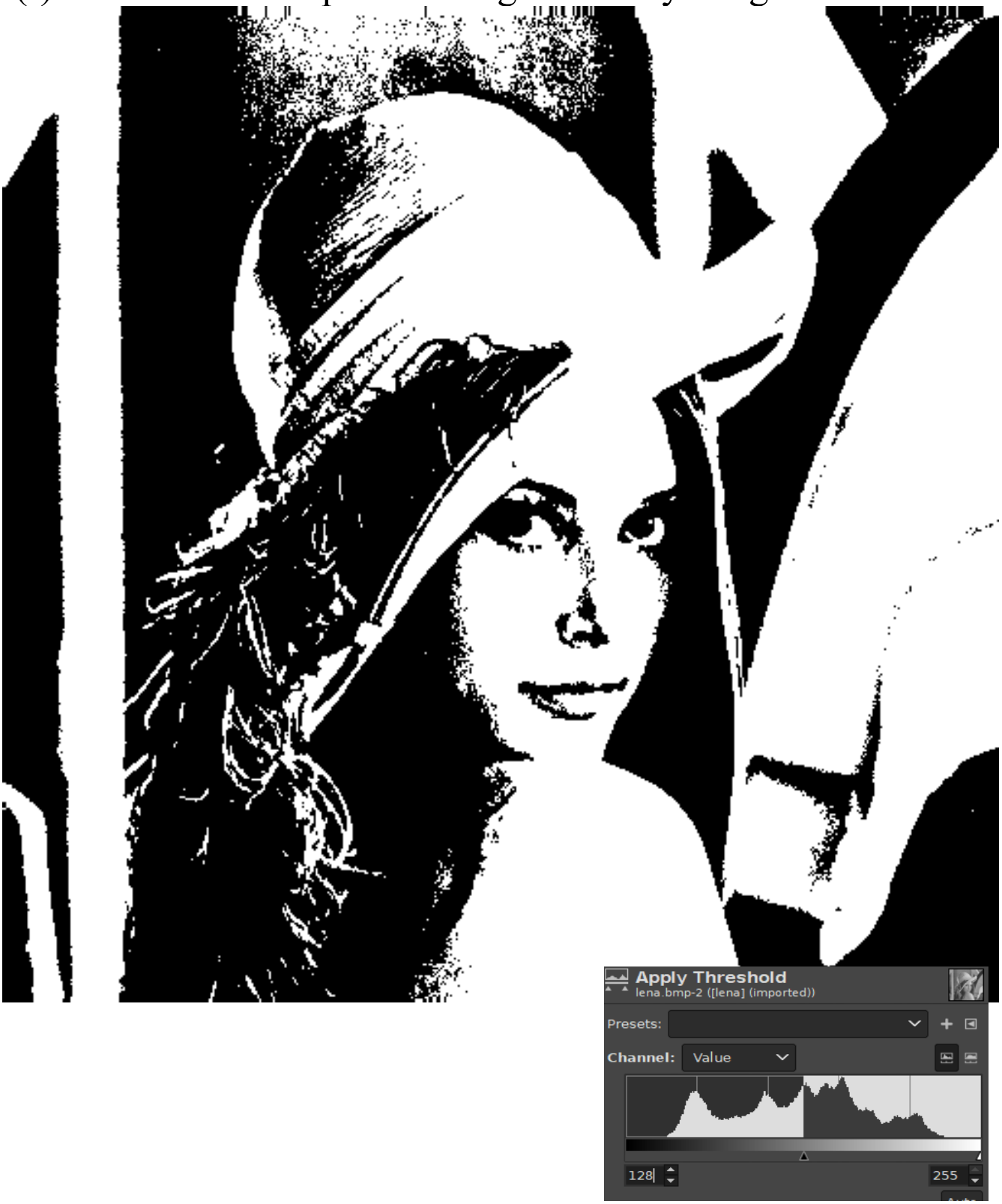






用 gimp 來縮小 tools->transform tools ->Scale

•(f) binarize lena.bmp at 128 to get a binary image



gimp->colors->Threshold->設成 128