

# pvisu : un visualiseur avancé d'images

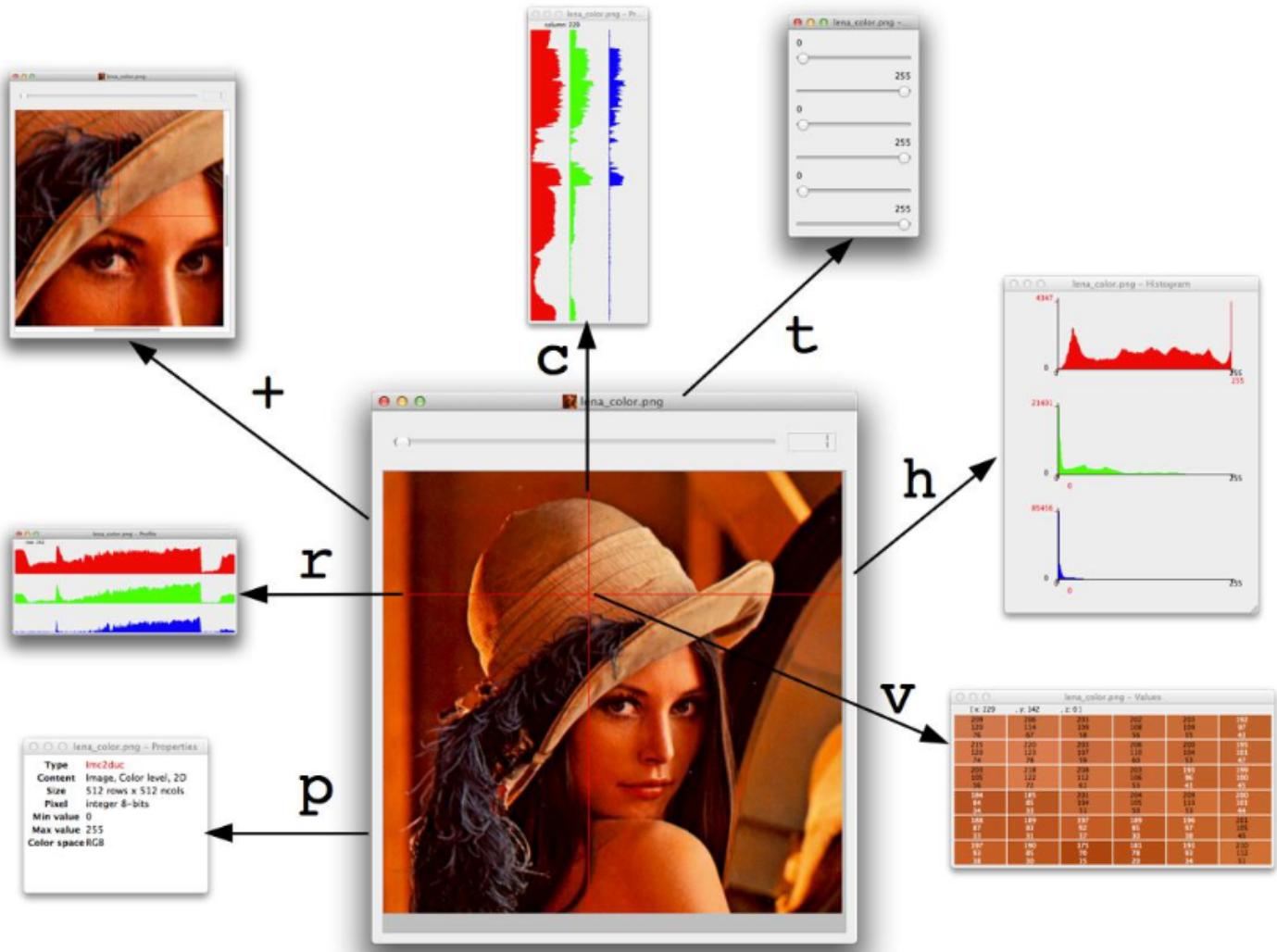


FIGURE 1 – \$> pvisu ./data/lena-color.png

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## bcl-basis

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```
extract-subimage <i> <j> <rows> <cols> <ims> <imd>
```



```
./extract-subimage  
100 100 200 100  
./data/lena-color.ppm  
a.ppm
```



```
./extract-subimage  
100 100 100 200  
./data/lena-color.ppm  
b.ppm
```

```
extract-channel <num> <ims> <imd>
```



```
./extract-channel 0  
./data/lena-color.ppm r.ppm
```



```
./extract-channel 1  
./data/lena-color.ppm g.ppm
```



```
./extract-channel 2  
./data/lena-color.ppm b.ppm
```

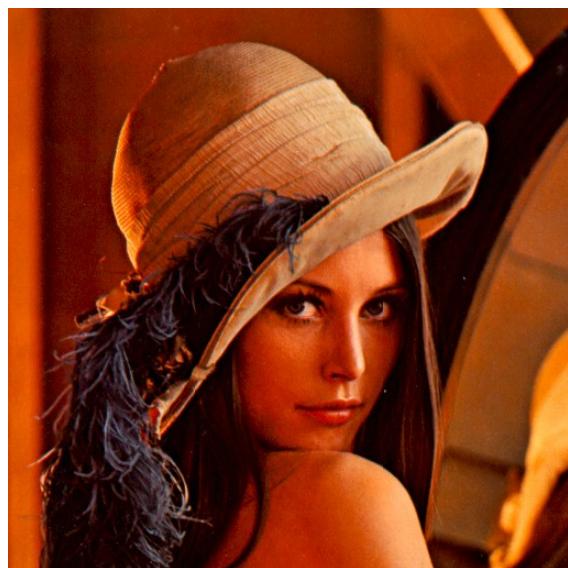
```
gray2color <ims0> <ims1> <ims2> <imd>
```



r.ppm

g.ppm

b.ppm



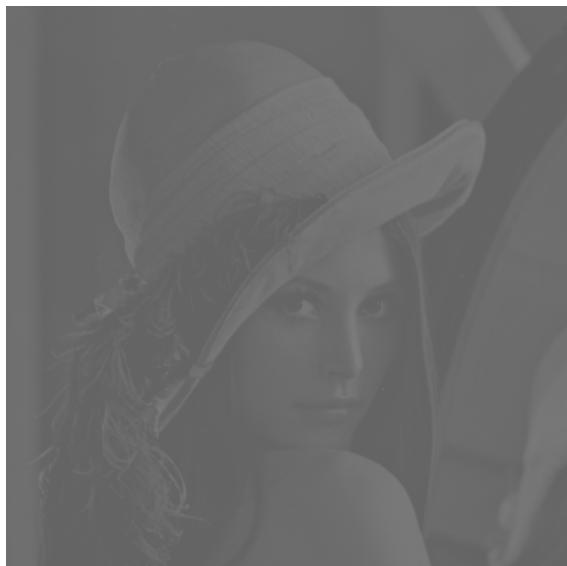
./gray2color r.ppm g.ppm b.ppm a.ppm

```
color2mean <ims> <imd>
```

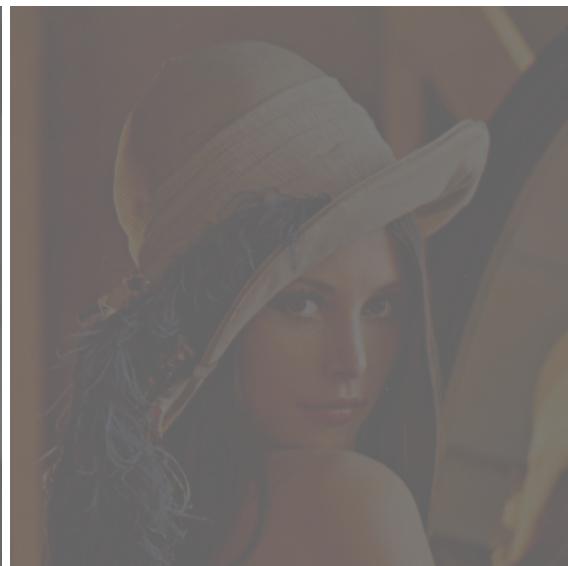


```
./color2mean ../datat/lena-color.ppm gray.ppm
```

```
normalize <min> <max> <ims> <imd>
```



```
./normalize 100 125 gray.ppm a.ppm
```



```
./normalize 100 125 ../data/lena-color.ppm  
a.ppm
```

---

# fourier

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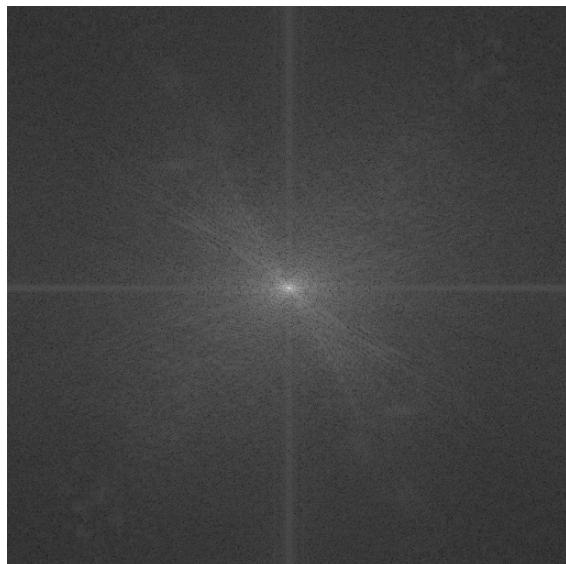
Fonction `test_forward_backward` de `test-fft.c`



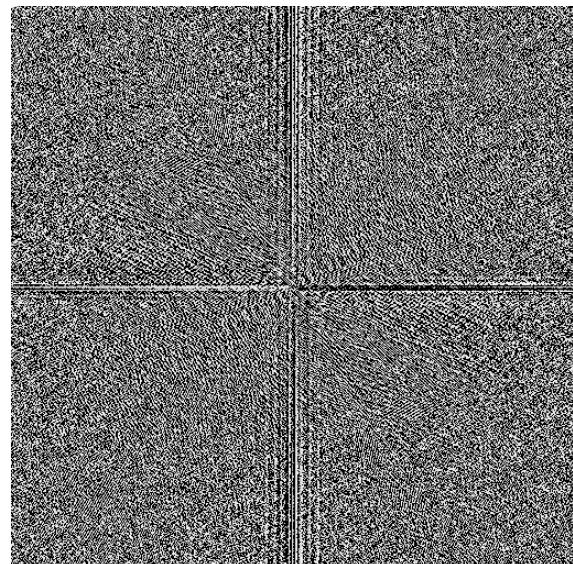
Fonction `test_reconstruction` de `test-fft.c`



## Fonction test\_display de test-fft.c

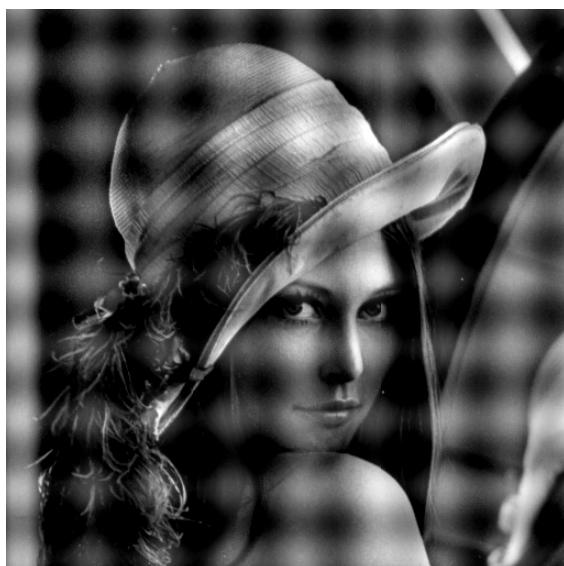


./test-fft ../data/lena-gray.ppm→AS-lena-gray.ppm

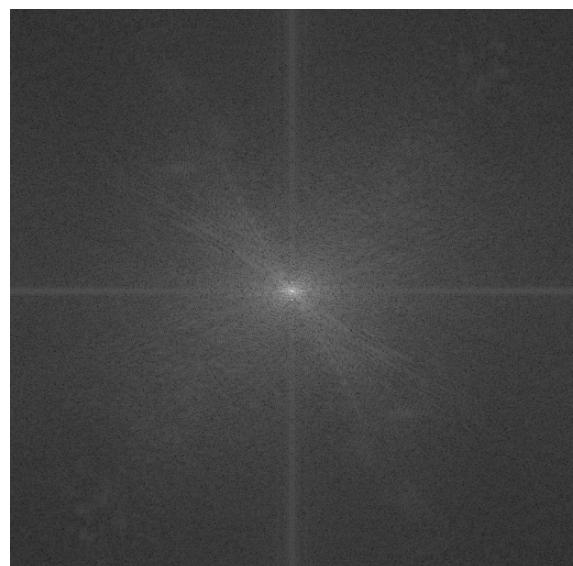


./test-fft ../data/lena-gray.ppm→PS-lena-gray.ppm

## Fonction test\_add\_frequencies de test-fft.c

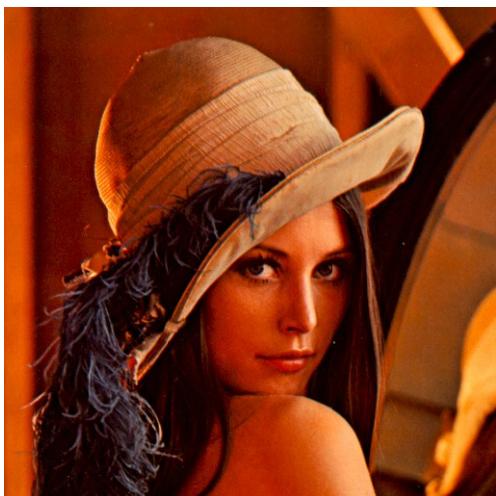


./test-fft ../data/lena-gray.ppm→FREQ-lena-gray.ppm

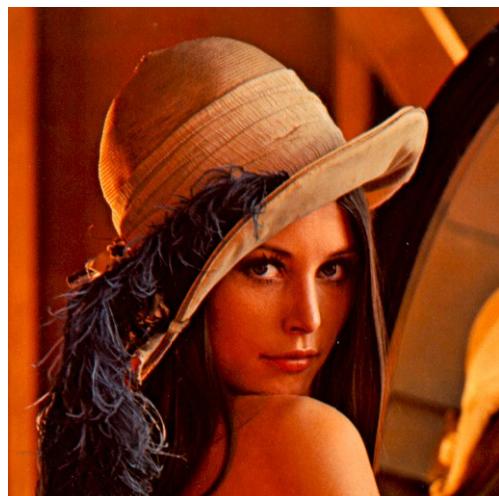


./test-fft ../data/lena-gray.ppm→FAS-lena-gray.ppm

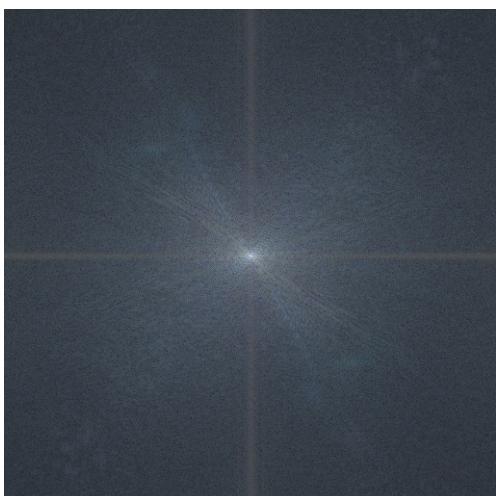
## Fonctions de test dans le cas d'une image couleur



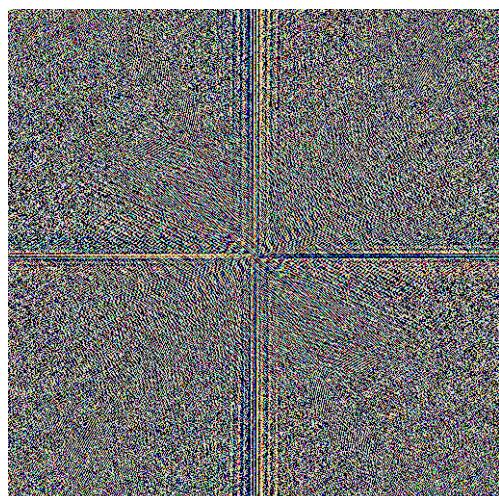
FB-lena-color.ppm



FB-ASPS-lena-color.ppm



AS-lena-color.ppm



PS-lena-color.ppm



FREQ-lena-color.ppm

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## ZOOM

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copy <factor> <ims> <imd>



padding <factor> <ims> <imd>



```
filter <factor> <filter-name> <ims> <imd>
```



```
./filter 15 box ../data/cameraman.ppm a.ppm ./filter 15 tent ../data/cameraman.ppm
```



```
./filter 15 bell ../data/cameraman.ppm a.ppm ./filter 15 mitch ../data/cameraman.ppm  
a.ppm
```

## Exemples en couleur



lena-small-rect.ppm



lena-small-rect-copy-10.ppm



lena-small-rect-padding-10.ppm



lena-small-rect-mitch-10.ppm

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# color-transfer

---

color-transfer <ims> <imt> <imd>



ocean.ppm



forest.ppm



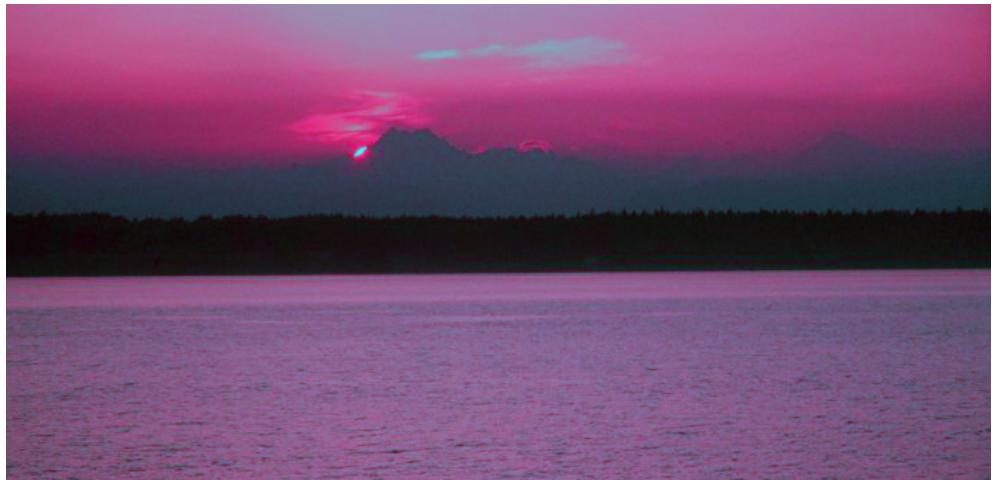
./color-transfer ../data/ocean.ppm ../data/forest.ppm a.ppm



flower.ppm



mountain.ppm



./color-transfer ../data/flower.ppm ../data/mountain.ppm a.ppm

---

# colorization

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FIGURE 2 – exemple de jittered grid

colorization <ims> <imt> <imd>



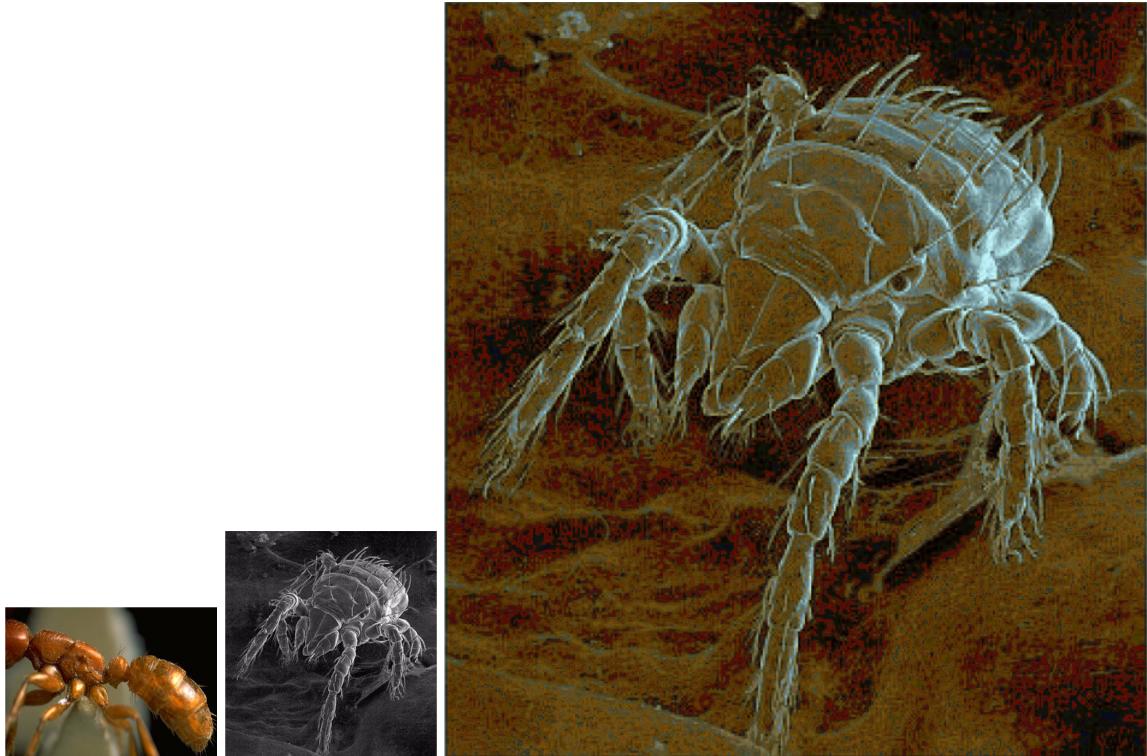
tree-c.ppm



tree-g.ppm



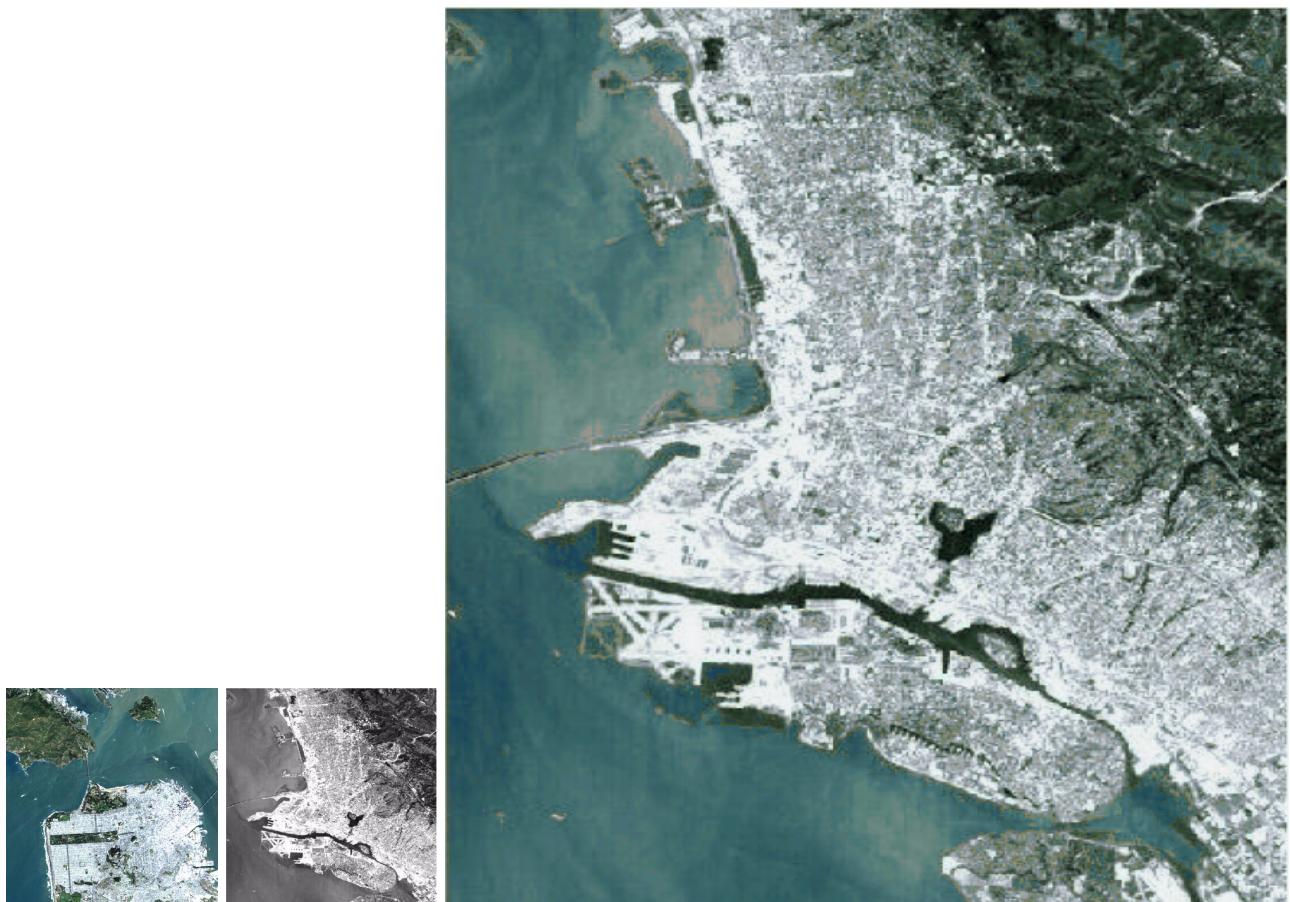
./colorization ./data/tree-c.ppm ./data/tree-g.ppm a.ppm



insect-c.ppm

insect-g.ppm

```
./colorization ../data/insect-c.ppm  
..../data/insect-g.ppm a.ppm
```



sat-c.ppm



sat-g.ppm

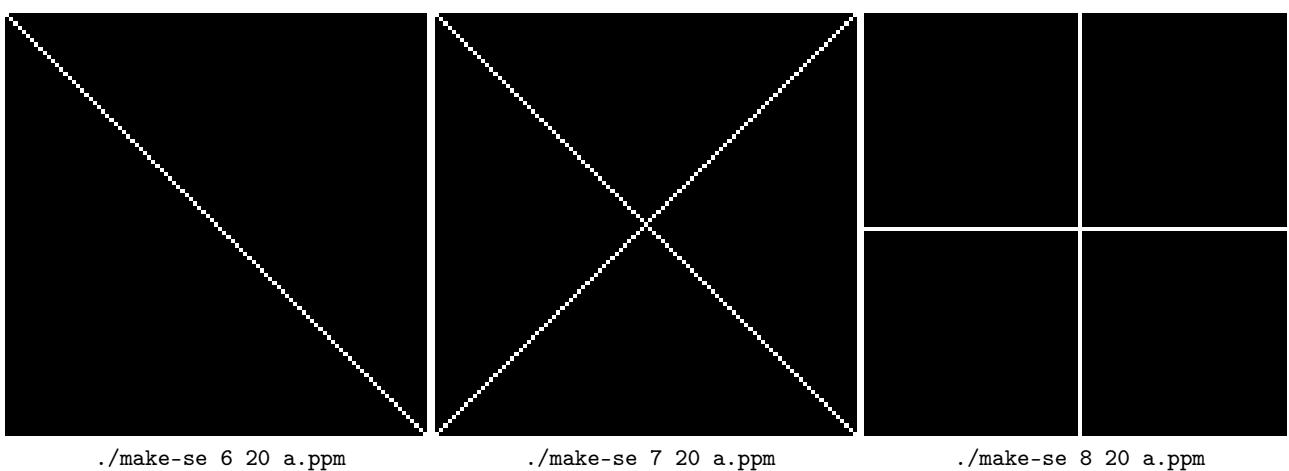
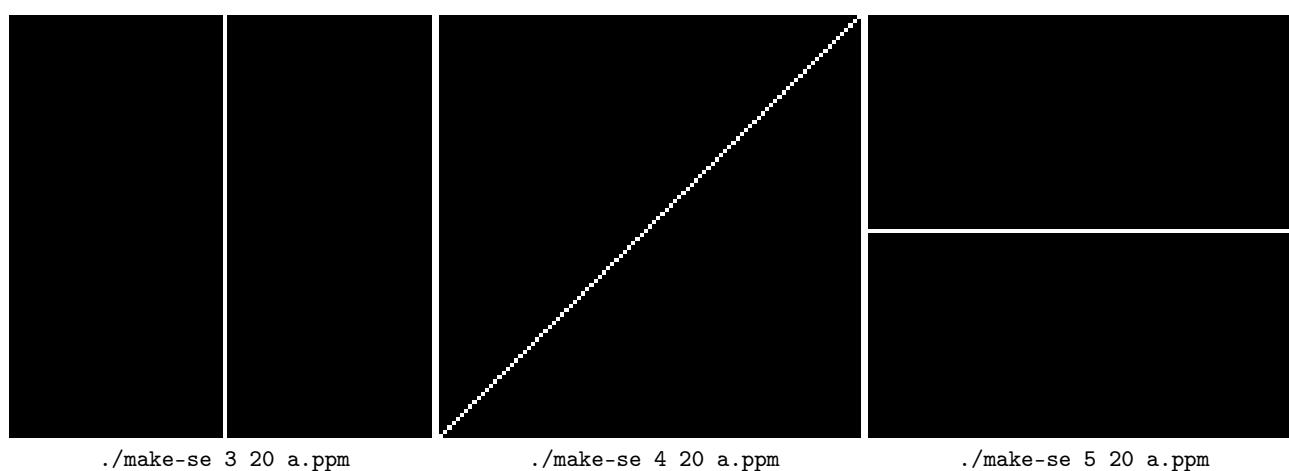
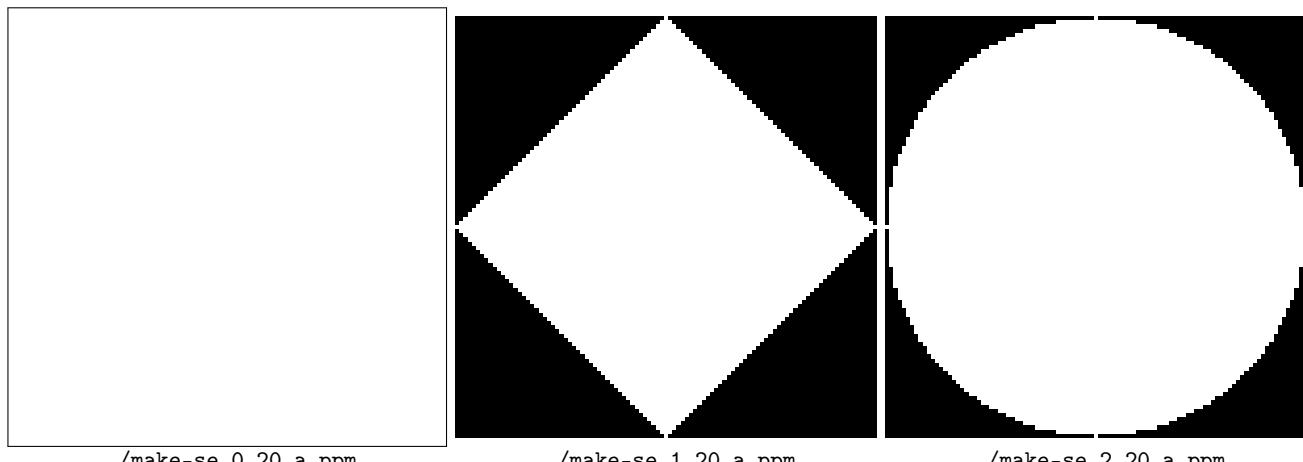
```
./colorization ../data/sat-c.ppm ..../data/sat-g.ppm a.ppm
```

---

# morphology

---

```
make-se <shape> <halfsize> <imd>
```



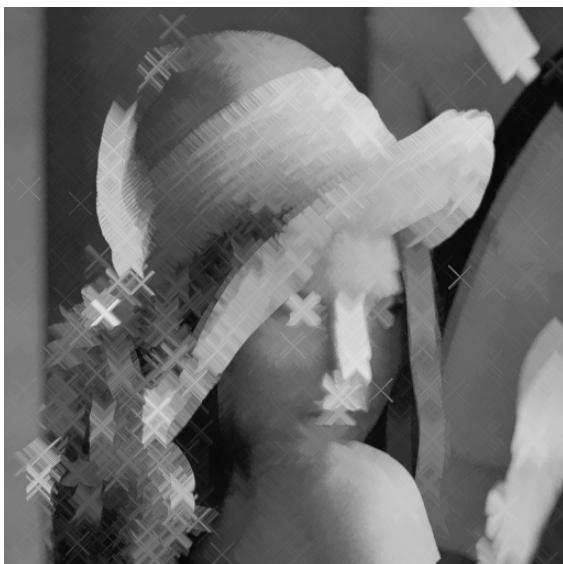
```
dilation / erosion <shape> <halfsize> <ims> <imd>
```



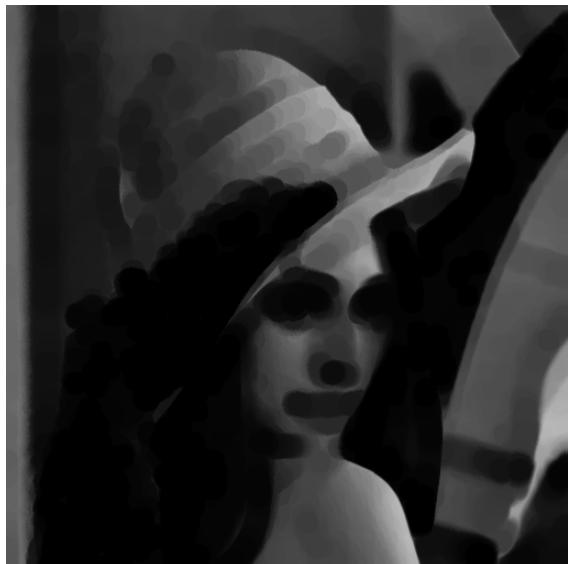
lena-gray.ppm



./dilation 2 10 ../data/lena-gray.ppm a.ppm



./dilation 7 10 ../data/lena-gray.ppm a.ppm



./erosion 2 10 ../data/lena-gray.ppm a.ppm

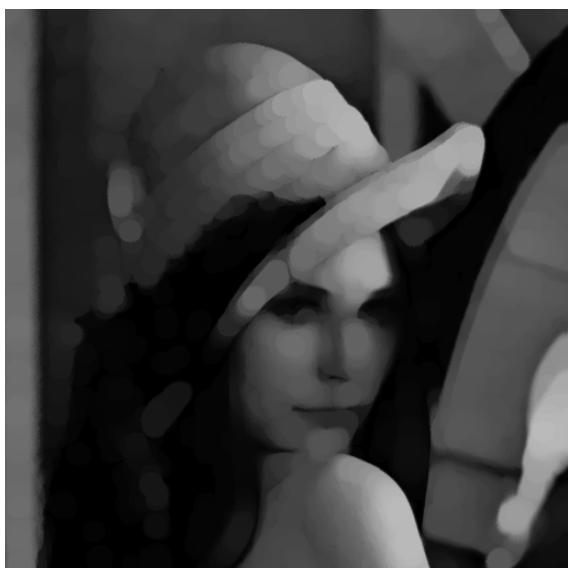


./erosion 7 10 ../data/lena-gray.ppm a.ppm

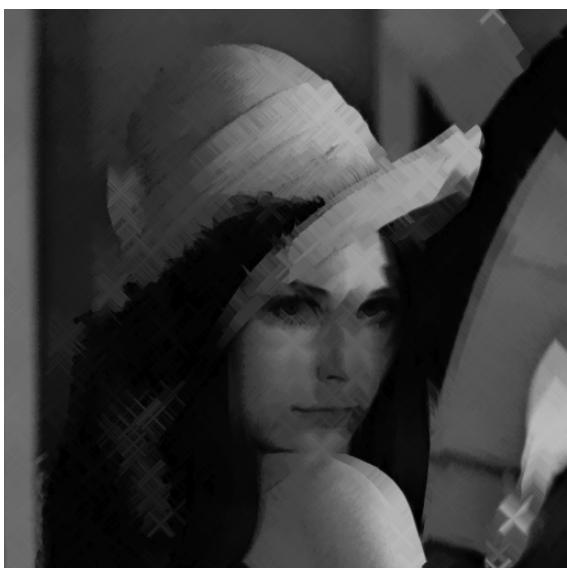
opening / closing <shape> <halfsize> <ims> <imd>



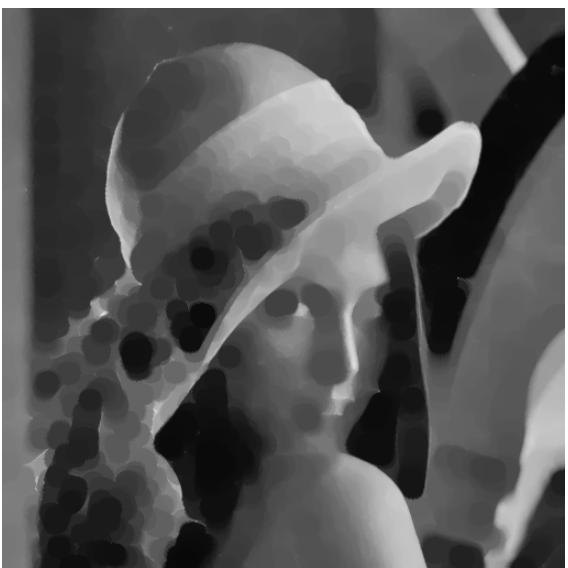
lena-gray.ppm



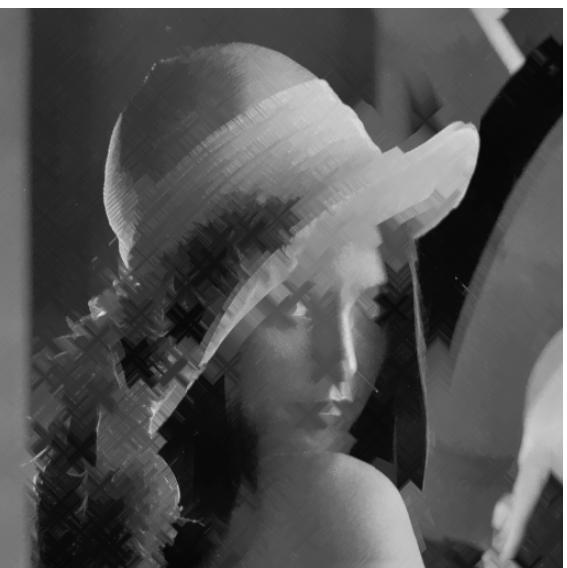
./opening 2 10 ../data/lena-gray.ppm a.ppm



./opening 7 10 ../data/lena-gray.ppm a.ppm



./closing 2 10 ../data/lena-gray.ppm a.ppm



./closing 7 10 ../data/lena-gray.ppm a.ppm

add / subtract <ims-1> <ims-2> <imd> : gradient morphologique



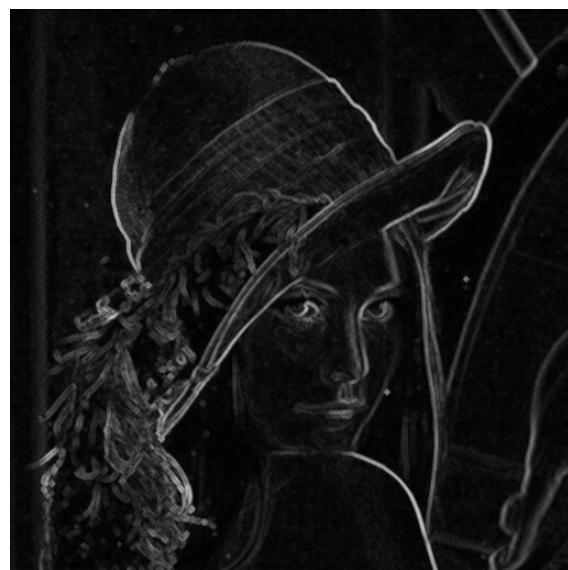
lena-gray.ppm



./dilation 2 2 ../data/lena-gray.ppm a.ppm

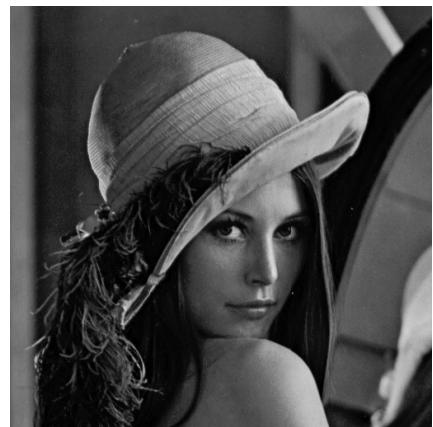


./erosion 2 2 ../data/lena-gray.ppm b.ppm



./subtract a.ppm b.ppm c.ppm : gradient morphologique

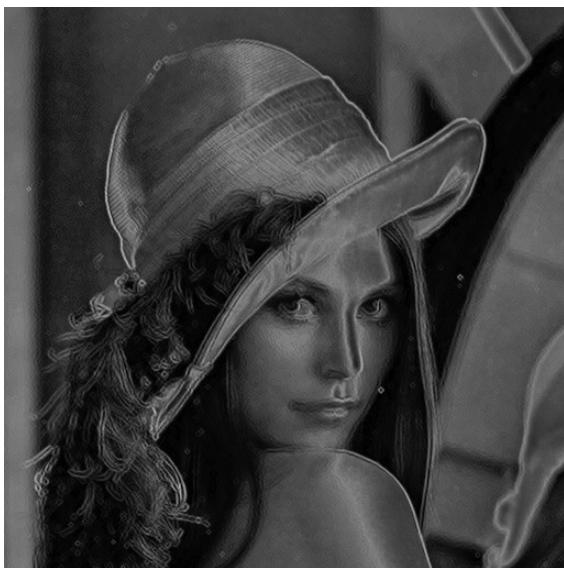
add / subtract <ims-1> <ims-2> <imd> : Laplacien morphologique



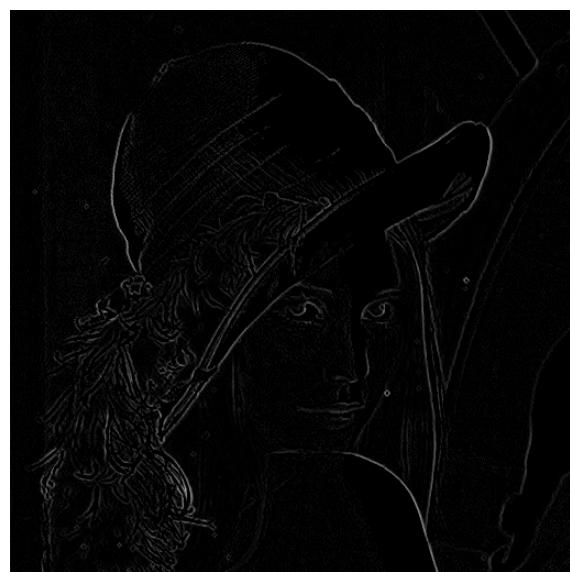
lena-gray.ppm



./add a.ppm b.ppm d.ppm

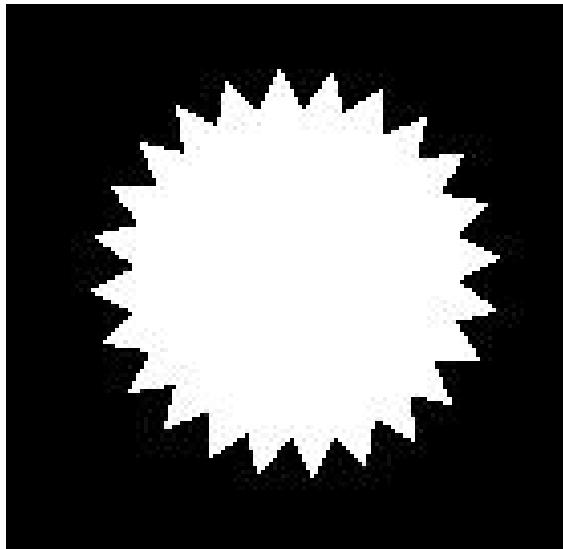


./subtract d.ppm ../data/lena-gray.ppm e.ppm

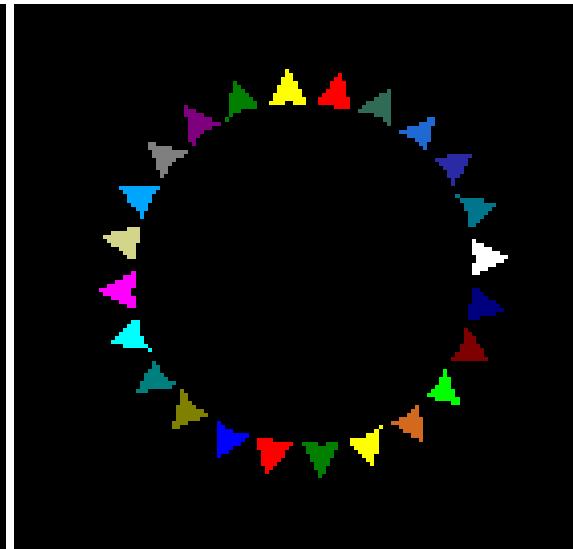


./subtract e.ppm ../data/lena-gray.ppm  
f.ppm : Laplacien morphologique

```
make extract-gear et labeling-color.c
```

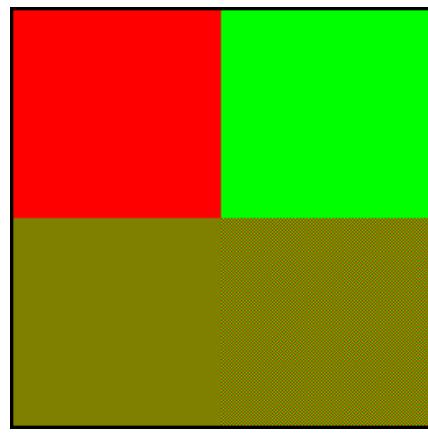


gear.ppm

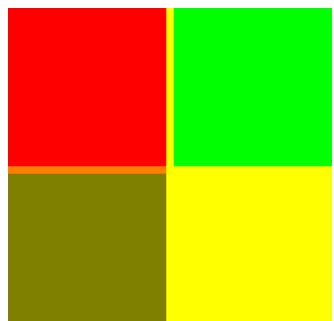


extract.sh

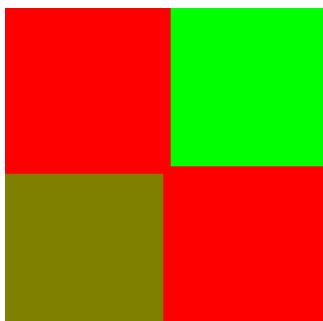
## Extension à la couleur



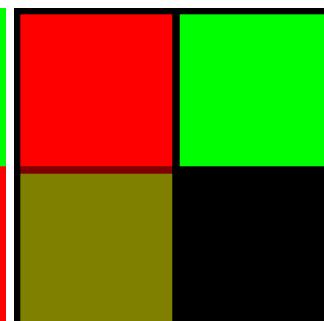
mm-color.ppm



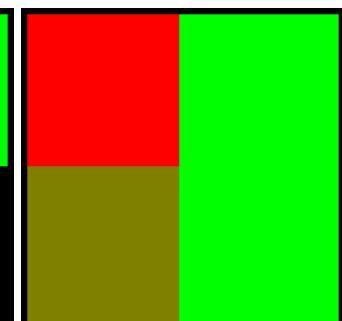
dilatation marginale



dilatation lexicographique



érosion marginale



érosion lexicographique

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# filter

---

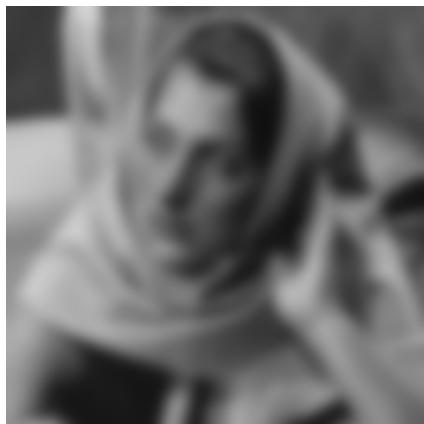
heat-equation <n> <ims> <imd>



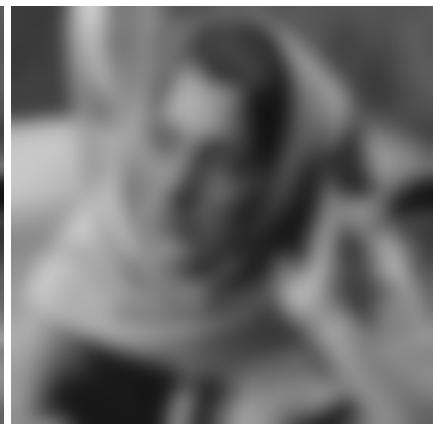
barbara.ppm



./heat-equation 10  
./data/barbara.ppm a.ppm



./heat-equation 50  
./data/barbara.ppm a.ppm

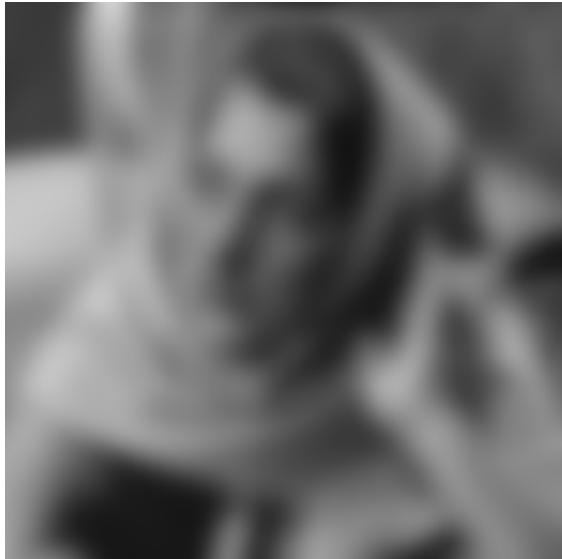


./heat-equation 100  
./data/barbara.ppm a.ppm

```
anisotropic-diffusion <n> <lambda> <function> <ims> <imd>
```



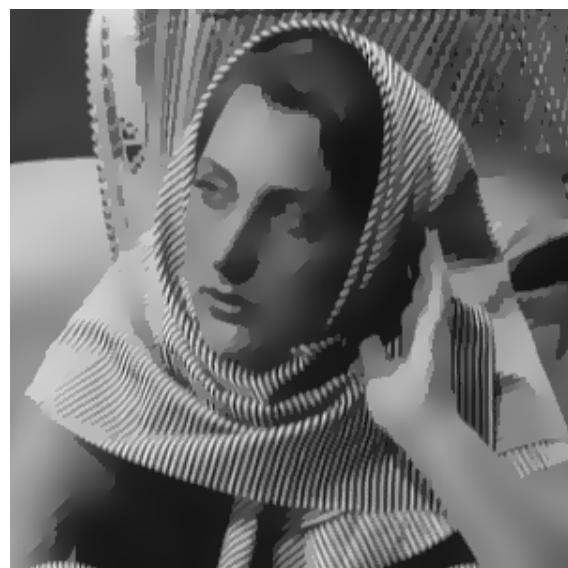
barbara.ppm



```
./anisotropic-diffusion 100 10 0  
..../data/barbara.ppm a.ppm
```



```
./anisotropic-diffusion 100 10 1  
..../data/barbara.ppm a.ppm
```



```
./anisotropic-diffusion 100 10 2  
..../data/barbara.ppm a.ppm
```

```
median <halfsize> <ims> <imd>
```



barbara-impulse.ppm



./median 1 ../data/barbara-impulse.ppm a.ppm ./median 2 ../data/barbara-impulse.ppm a.ppm



./median 3 ../data/barbara-impulse.ppm a.ppm

```
bilateral <sigma_s> <sigma_g> <ims> <imd>
```



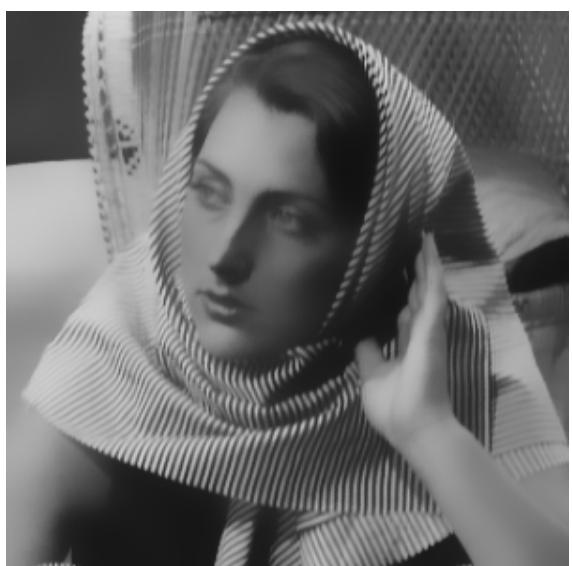
barbara.ppm



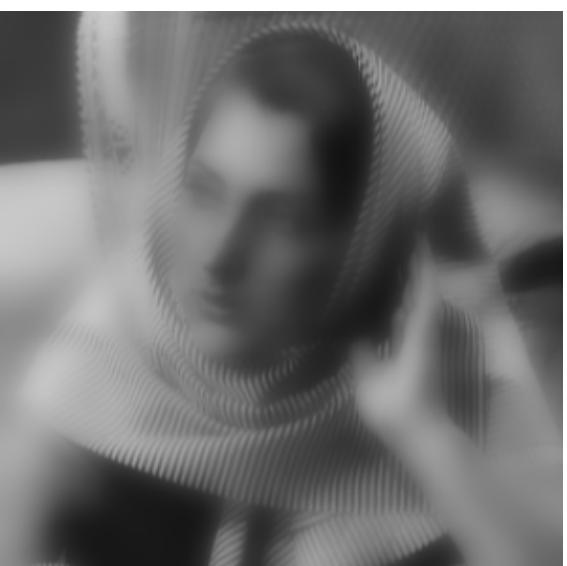
./bilateral 3 30 ../data/barbara.ppm a.ppm



./bilateral 3 100 ../data/barbara.ppm a.ppm



./bilateral 10 30 ../data/barbara.ppm a.ppm



./bilateral 10 100 ../data/barbara.ppm a.ppm

```
nlmeans <sigma> <ims> <imd>
```



barbara.ppm



./nlmeans 5 ../data/barbara.ppm a.ppm



./nlmeans 15 ../data/barbara.ppm a.ppm



barbara-gaussian-10.ppm



./nlmeans 10 ../data/barbara-gaussian-10.ppm  
a.ppm

```
butterworth <ims> <imd> <function> <d0> <n> <w> <u0> <v0>
```



```
./butterworth ../data/lena-gray.ppm a.ppm lp 32 2 0 0 0
```

```
./butterworth ../data/lena-gray.ppm a.ppm hp 32 2 0 0 0
```



```
./butterworth ../data/lena-gray.ppm a.ppm br 128 2 64 0 0
```

```
./butterworth ../data/lena-gray.ppm a.ppm bp 64 2 64 0 0
```

```
butterworth <ims> <imd> <function> <d0> <n> <w> <u0> <v0>
```



lena-sin.ppm



./butterworth ../data/lena-sin.ppm a.ppm no 1 2 0 0 8

# pipeline

make pipeline

This image shows a scanned copy of a handwritten survey form. The form includes sections for basic information, household details, and various household items. Handwritten responses are present in several fields, such as 'Mother tongue' (Marathi), 'Electricity' (Own meter), and 'Comforts' (Cable, Fan, Fridge, Newspaper). The handwriting is somewhat legible but contains some errors and variations.

test-01.ppm

This image shows a scanned copy of a processed survey form. The handwritten data from the original form has been converted into a clean, digital format with radio buttons for selection. The processed version is more structured and easier to read than the original scan.

result

This image shows a scanned copy of a handwritten survey form, similar in structure to 'test-01.ppm'. It includes sections for basic information, household details, and various household items. Handwritten responses are present in several fields, such as 'Mother tongue' (Marathi), 'Electricity' (Own meter), and 'Comforts' (Cable, Fan, Fridge, Newspaper). The handwriting is clear but contains some variations.

test-02.ppm

This image shows a scanned copy of a processed survey form, similar to the one in 'result'. The handwritten data from 'test-02.ppm' has been converted into a clean, digital format with radio buttons for selection. The processed version is more structured and easier to read than the original scan.

result