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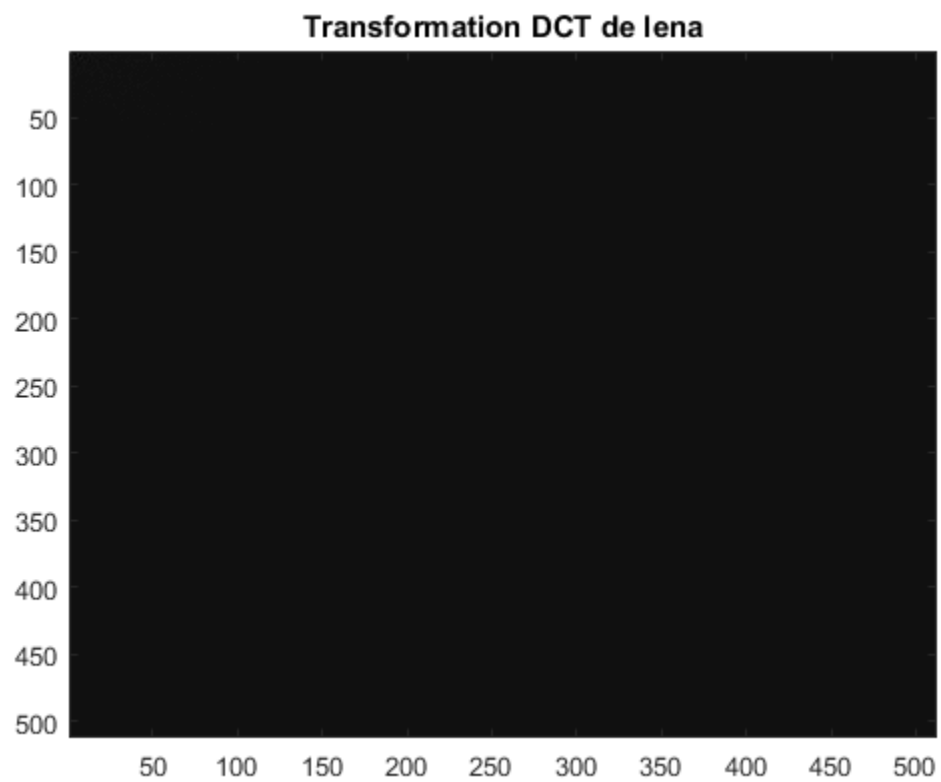
```
%*****%
%**          Mami FOFANA & Sanoussi FOFANA          **%
%**          TP2 DCT transform                      *%%
%*****%
```

```
clear all; close all; clc;
```

LENA

```
%%%%%%%%%%%% LENA %%%%%%%%%%
%%%%%%%%%
```

```
lena = imread('lena.jpg');
lena = double(lena);
lena_dct = dct2(lena);
figure(); imagesc(lena);
colormap(gray);
title('Original lena')
figure();
imagesc(lena_dct);
colormap(gray); title('Transformation DCT de lena');
```



Filtre passe bas lena

```
***** Filtrage passe Bas *****%%%%%%%%%

%%%%%%%% k=256,128,64,32,16 %%%%%%%%%%
%*****

%***** k = 256 *****%
lena_dct_passeBas256 = passeBas(lena_dct,256);
lena_passeBas256 = idct2(lena_dct_passeBas256);
figure
imagesc(lena_passeBas256);
colormap(gray);
title('lena passe Bas 256');

%***** k = 128 *****%
lena_dct_passeBas128 = passeBas(lena_dct,128);
lena_passeBas128 = idct2(lena_dct_passeBas128);
figure
imagesc(lena_passeBas128);
colormap(gray);
title('lena passe Bas 128');

%***** k = 64 *****%
lena_dct_passeBas64 = passeBas(lena_dct,64);
lena_passeBas64 = idct2(lena_dct_passeBas64);
figure
imagesc(lena_passeBas64);
colormap(gray);
title('lena filtre passe Bas 64');

%***** k = 32 *****%
lena_dct_passeBas32 = passeBas(lena_dct,32);
lena_passeBas32 = idct2(lena_dct_passeBas32);
figure
imagesc(lena_passeBas32);
colormap(gray);
title('lena filtre passe bas 32');

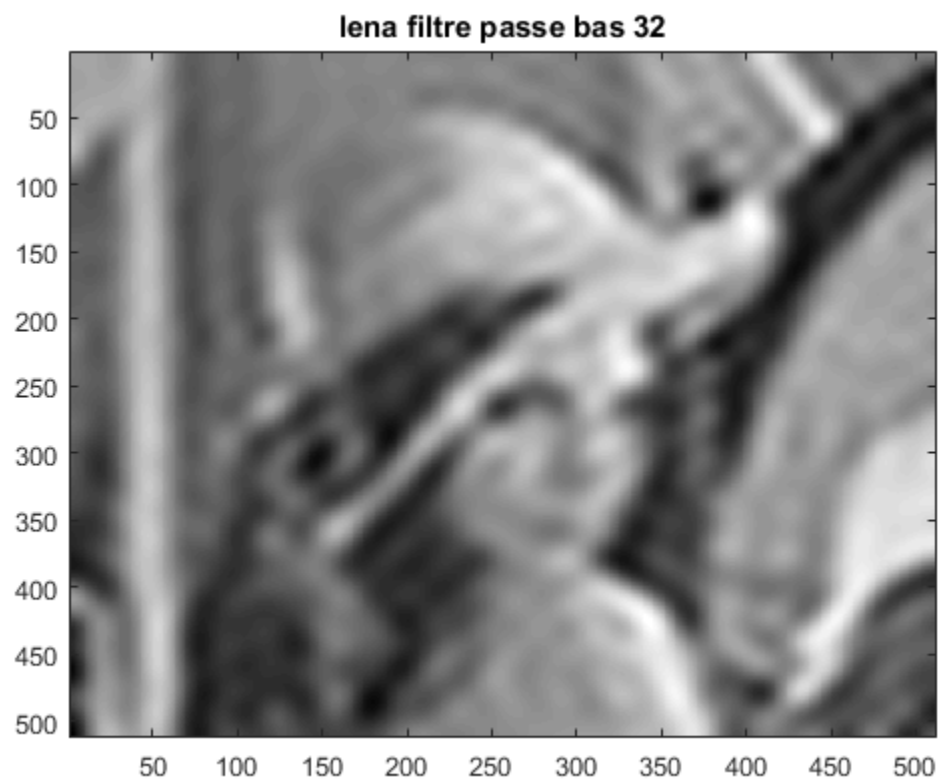
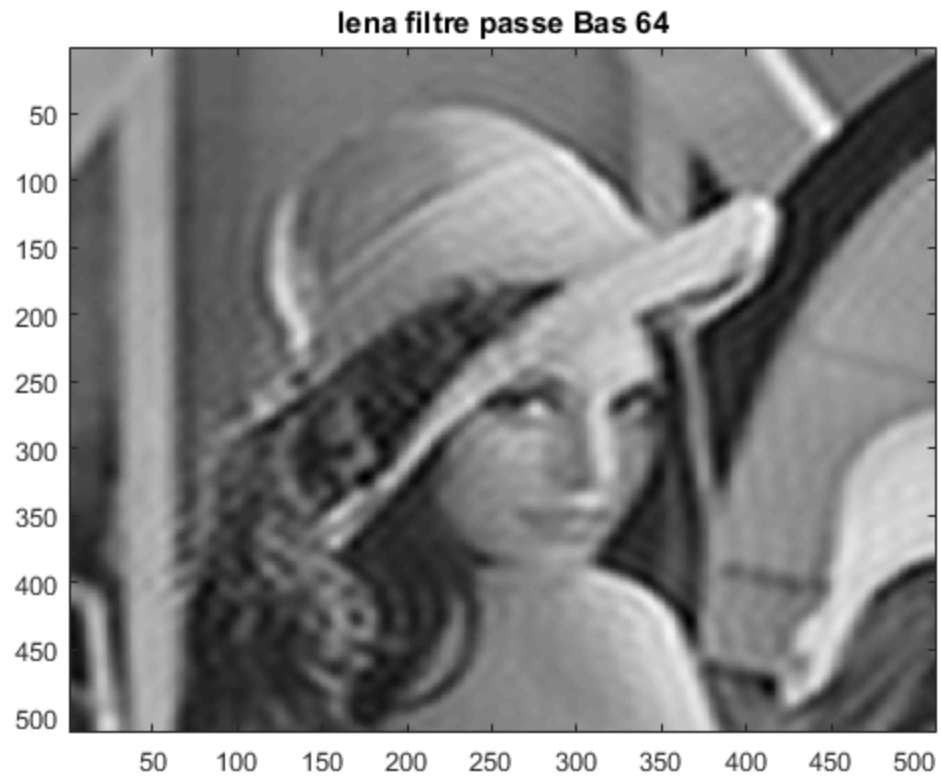
%***** k = 18 *****%
lena_dct_passeBas16 = passeBas(lena_dct,16);
lena_passeBas16 = idct2(lena_dct_passeBas16);
figure();
imagesc(lena_passeBas16);
colormap(gray);
title('lena lowpass 16');
```

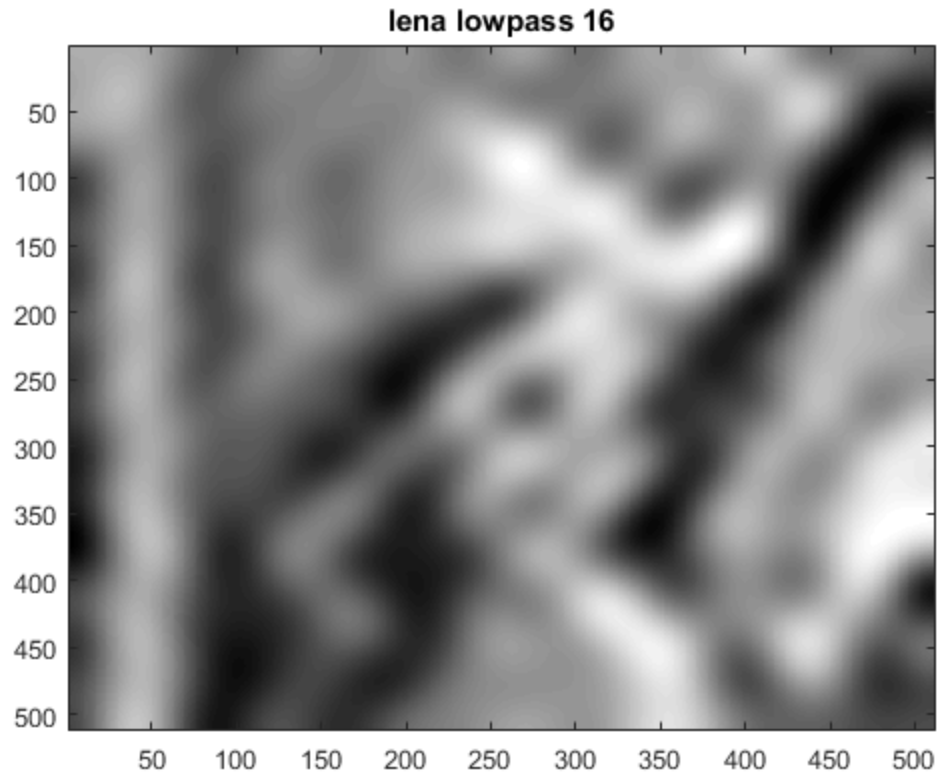
lena passe Bas 256



lena passe Bas 128







Filtrage passe haut

```
***** Filtrage passe haut ***** % %

%***** k=2, 4, 8, 16, 32
%*****%
%*****%
%

%***** k = 2
%*****%
lena_dct_passeHaut2 = passeHaut(lena_dct,2);
lena_passeHaut2 = idct2(lena_dct_passeHaut2);
figure();
imagesc(lena_passeHaut2);
colormap(gray);
title('lena passe haut pour k=2');

%***** k = 4
%*****%
lena_dct_passeHaut4 = passeHaut(lena_dct,4);
lena_passeHaut4 = idct2(lena_dct_passeHaut4);
figure();
imagesc(lena_passeHaut4);
colormap(gray);
title('lena passe haut 4');
```

```
%***** k = 8
*****%
lena_dct_passeHaut8 = passeHaut(lena_dct,8);
lena_passeHaut8 = idct2(lena_dct_passeHaut8);
figure();
imagesc(lena_passeHaut8);
colormap(gray);
title('lena passe haut 8');

%***** k = 16
*****%
lena_dct_passeHaut16 = passeHaut(lena_dct,16);
lena_passeHaut16 = idct2(lena_dct_passeHaut16);
figure();
imagesc(lena_passeHaut16);
colormap(gray);
title('lena passe haut 16');

%***** k = 32
*****%
lena_dct_passeHaut32 = passeHaut(lena_dct,32);
lena_passeHaut32 = idct2(lena_dct_passeHaut32);
figure();
imagesc(lena_passeHaut32);
colormap(gray);
title('lena passe haut 32');
```

lena passe haut pour k=2



lena passe haut 4

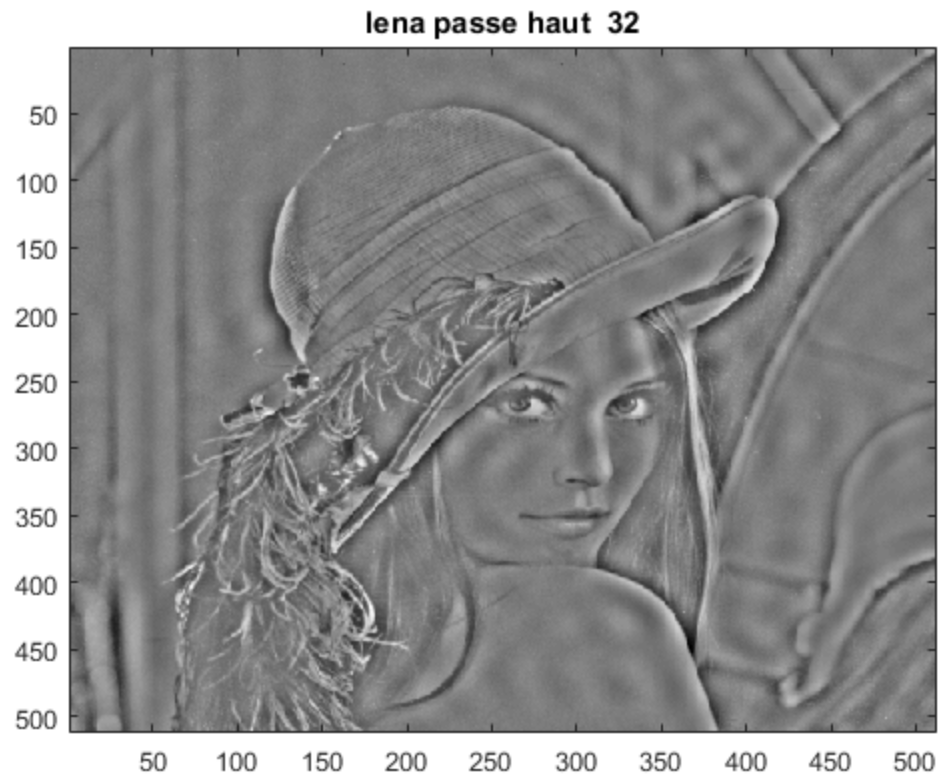


lena passe haut 8



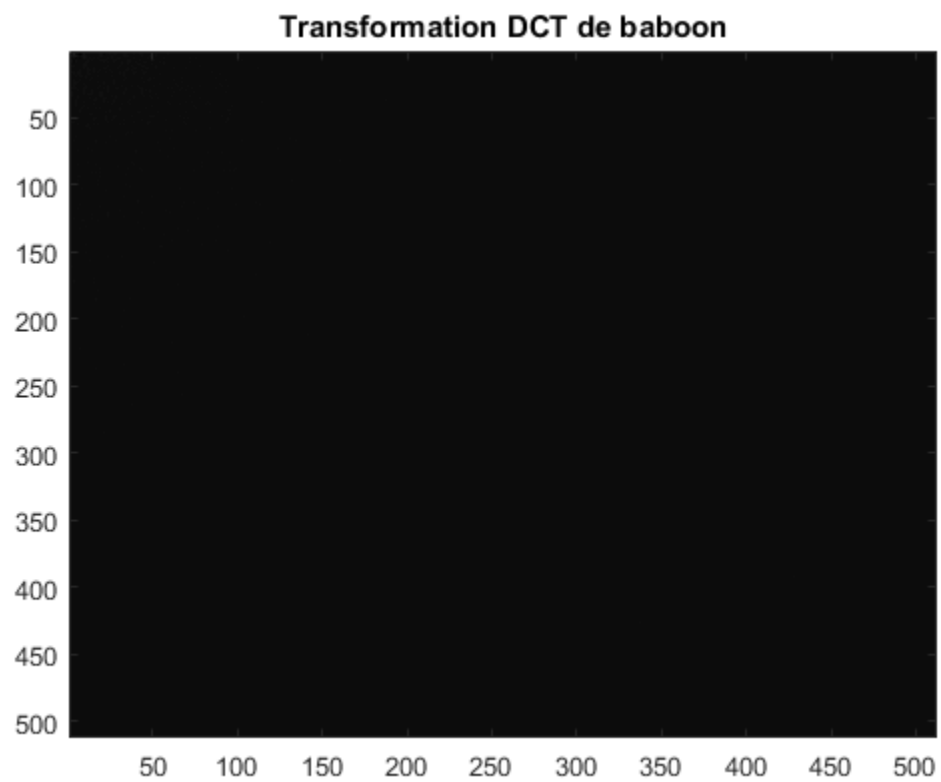
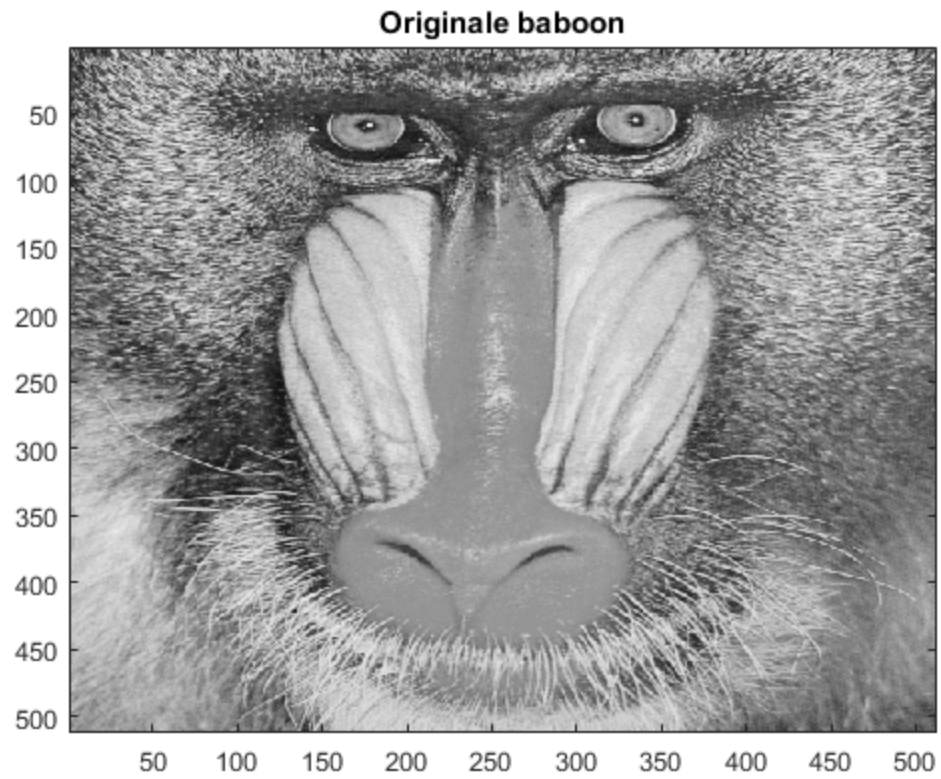
lena passe haut 16





BABOON

```
***** BABOON *****%%  
  
%*****  
%  
baboon = imread('Baboon.jpg');  
baboon = double(baboon);  
baboon_dct = dct2(baboon);  
figure();  
imagesc(baboon);  
colormap(gray);  
title('Originale baboon')  
figure();  
imagesc(baboon_dct);  
colormap(gray);  
title('Transformation DCT de baboon');
```



Filtrage passe Bas

```
***** Filtrage passe Bas *****%%%%%%%%%

%%%%%%%% k=256,128,64,32,16 %%%%%%%%%%
%*****

%***** k = 256 *****%
baboon_dct_passeBas256 = passeBas(baboon_dct,256);
baboon_passeBas256 = idct2(baboon_dct_passeBas256);
figure
imagesc(baboon_passeBas256);
colormap(gray);
title('baboon passe Bas 256');

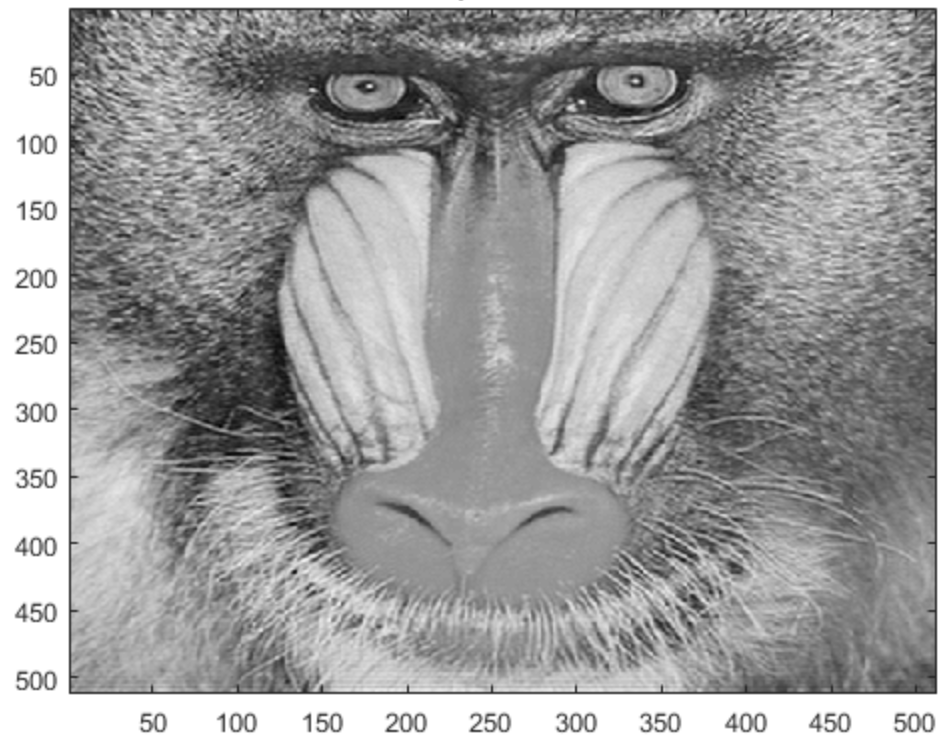
%***** k = 128 *****%
baboon_dct_passeBas128 = passeBas(baboon_dct,128);
baboon_passeBas128 = idct2(baboon_dct_passeBas128);
figure
imagesc(baboon_passeBas128);
colormap(gray);
title('baboon passe Bas 128');

%***** k = 64 *****%
baboon_dct_passeBas64 = passeBas(baboon_dct,64);
baboon_passeBas64 = idct2(baboon_dct_passeBas64);
figure
imagesc(baboon_passeBas64);
colormap(gray);
title('baboon filtre passe Bas 64');

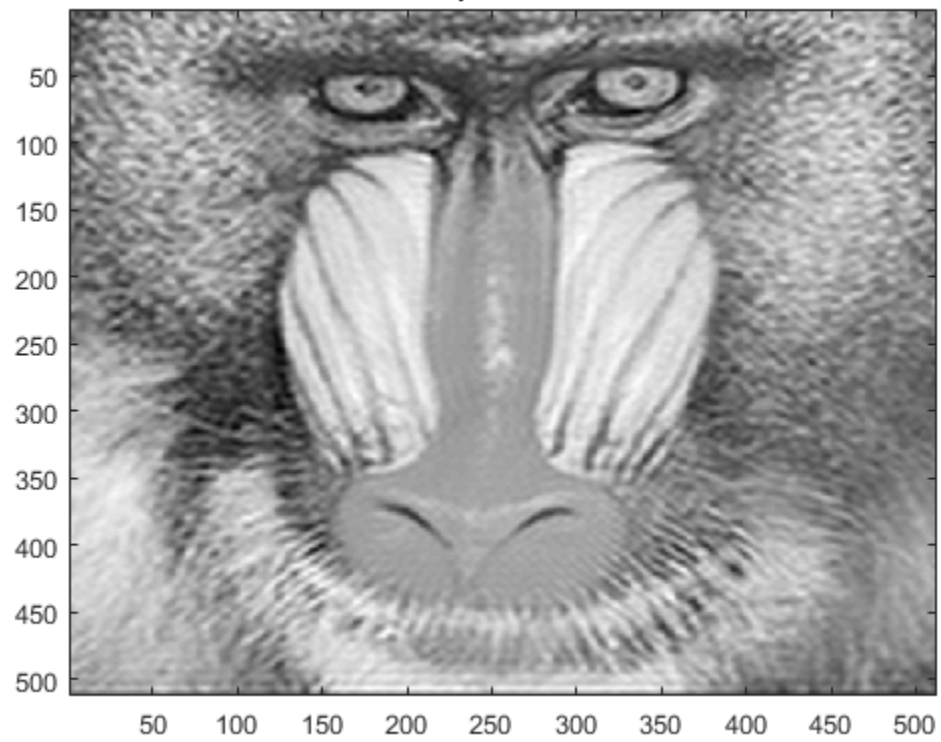
%***** k = 32 *****%
baboon_dct_passeBas32 = passeBas(baboon_dct,32);
baboon_passeBas32 = idct2(baboon_dct_passeBas32);
figure
imagesc(baboon_passeBas32);
colormap(gray);
title('baboon filtre passe bas 32');

%***** k = 16 *****%
baboon_dct_passeBas16 = passeBas(baboon_dct,16);
baboon_passeBas16 = idct2(baboon_dct_passeBas16);
figure();
imagesc(baboon_passeBas16);
colormap(gray);
title('baboon passe bas 16');
```

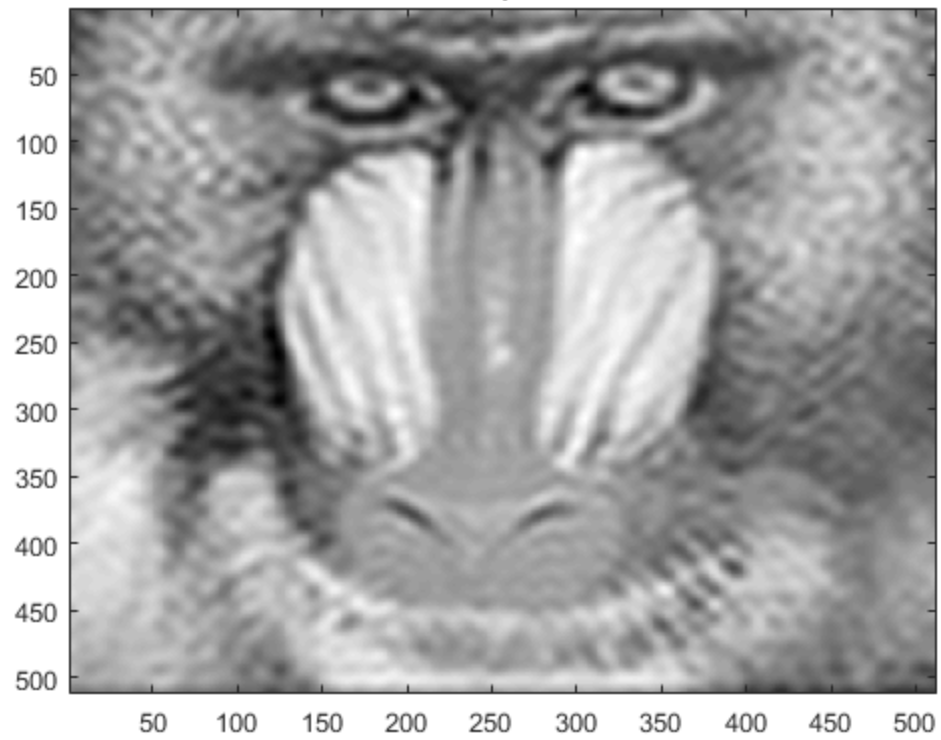
baboon passe Bas 256



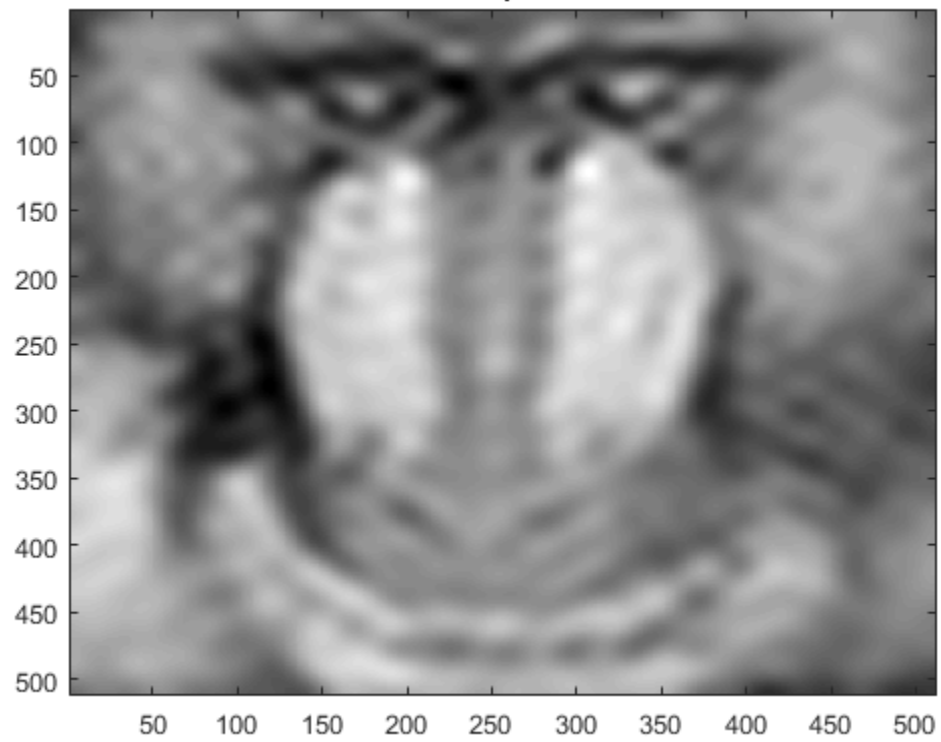
baboon passe Bas 128

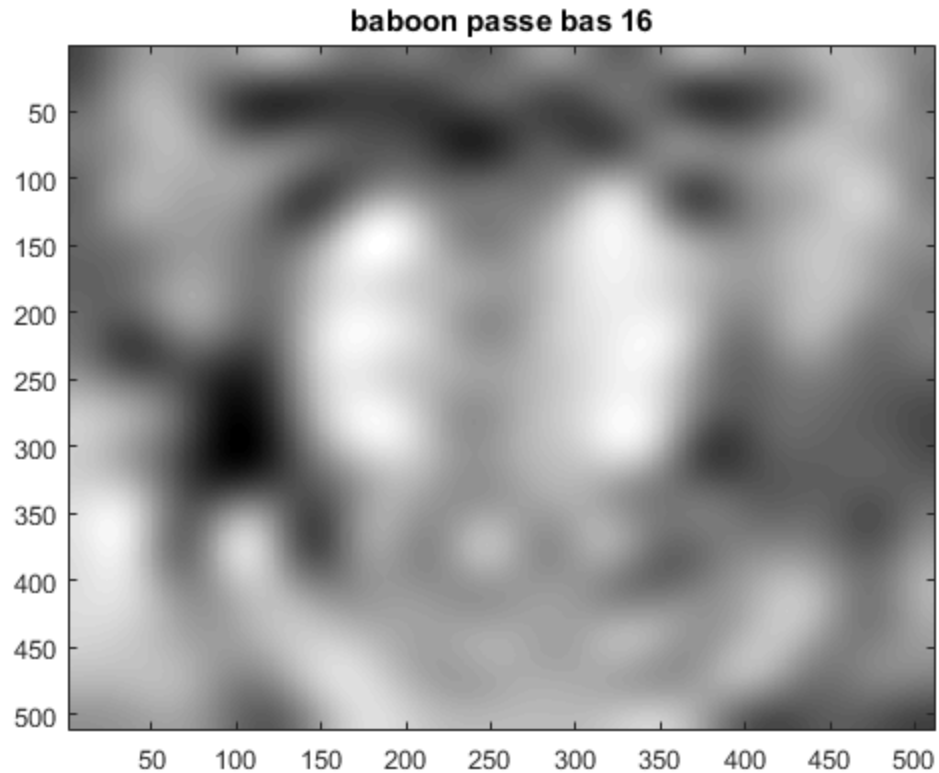


baboon filtre passe Bas 64



baboon filtre passe bas 32





Filtrage passe Haut

```
***** Filtrage passe haut ***** %
%***** k=2, 4, 8, 16, 32
%*****%
%*****%
%*****%

%***** k = 2
%*****%
baboon_dct_passeHaut2 = passeHaut(baboon_dct,2);
baboon_passeHaut2 = idct2(baboon_dct_passeHaut2);
figure();
imagesc(baboon_passeHaut2);
colormap(gray);
title('baboon passe haut pour k=2');

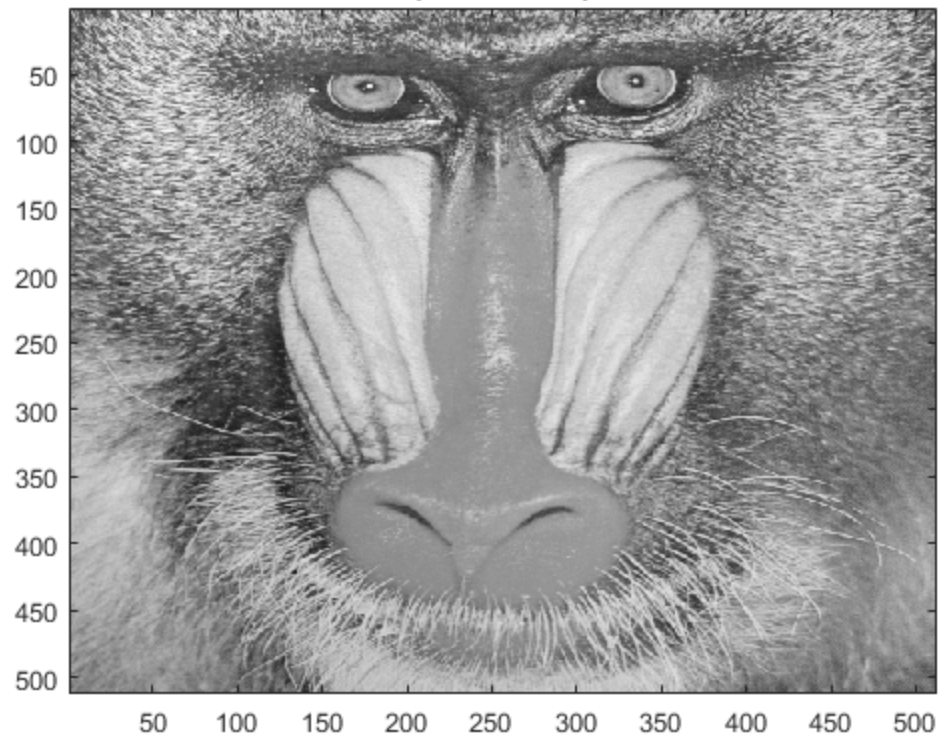
%***** k = 4
%*****%
baboon_dct_passeHaut4 = passeHaut(baboon_dct,4);
baboon_passeHaut4 = idct2(baboon_dct_passeHaut4);
figure();
imagesc(baboon_passeHaut4);
colormap(gray);
title('baboon passe haut 4');
```

```
%***** k = 8
*****%
baboon_dct_passeHaut8 = passeHaut(baboon_dct,8);
baboon_passeHaut8 = idct2(baboon_dct_passeHaut8);
figure();
imagesc(baboon_passeHaut8);
colormap(gray);
title('baboon passe haut 8');

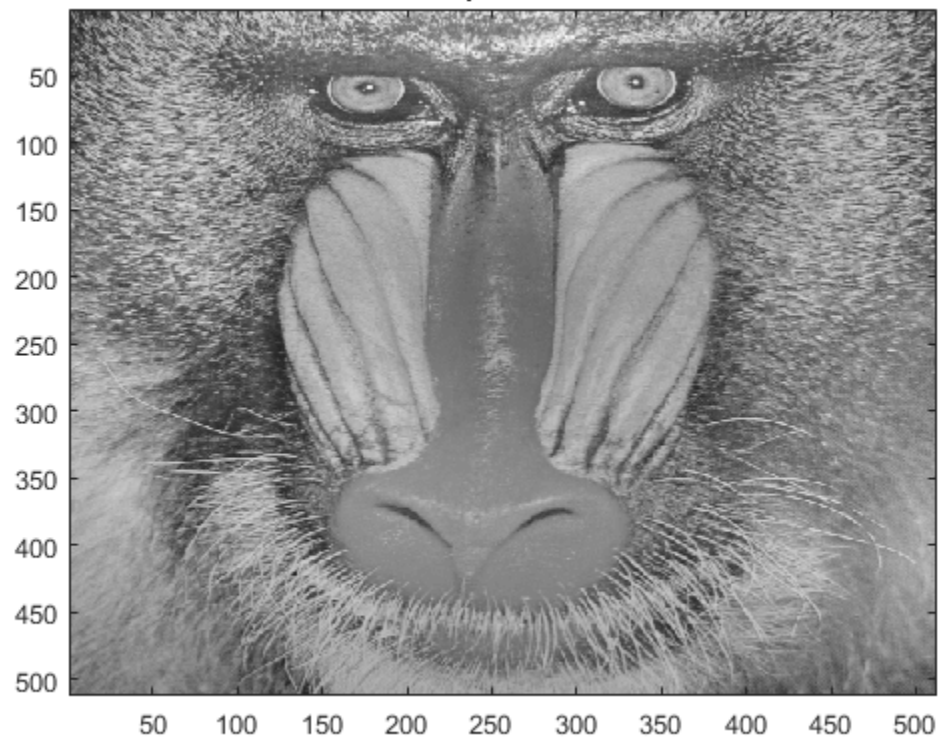
%***** k = 16
*****%
baboon_dct_passeHaut16 = passeHaut(baboon_dct,16);
baboon_passeHaut16 = idct2(baboon_dct_passeHaut16);
figure();
imagesc(baboon_passeHaut16);
colormap(gray);
title('baboon passe haut 16');

%***** k = 32
*****%
baboon_dct_passeHaut32 = passeHaut(baboon_dct,32);
baboon_passeHaut32 = idct2(baboon_dct_passeHaut32);
figure();
imagesc(baboon_passeHaut32);
colormap(gray);
title('baboon passe haut 32');
```

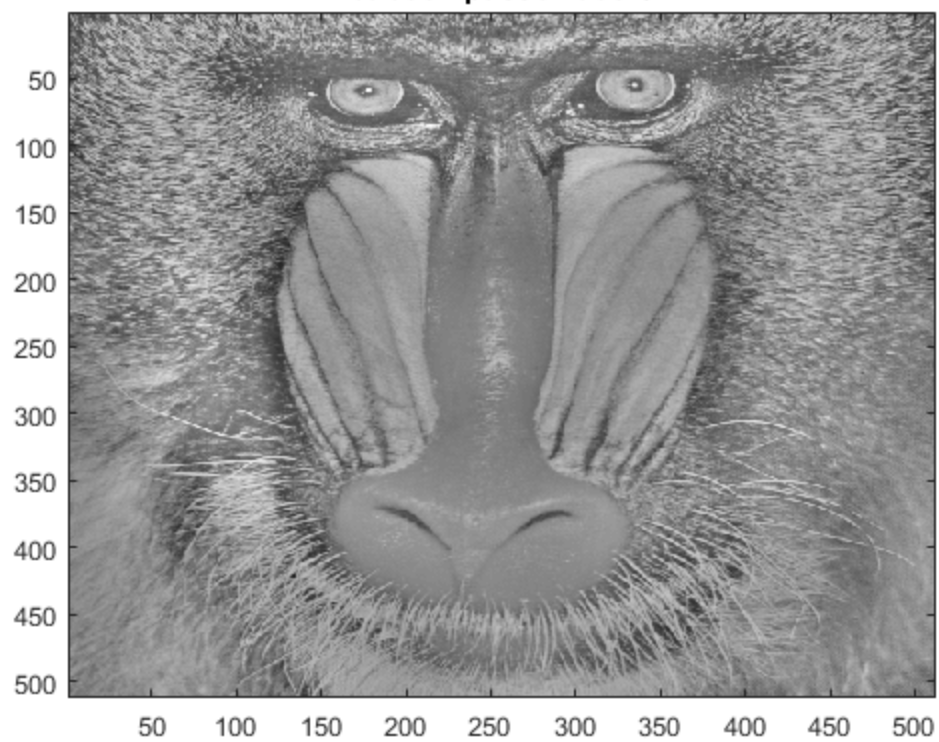

baboon passe haut pour k=2



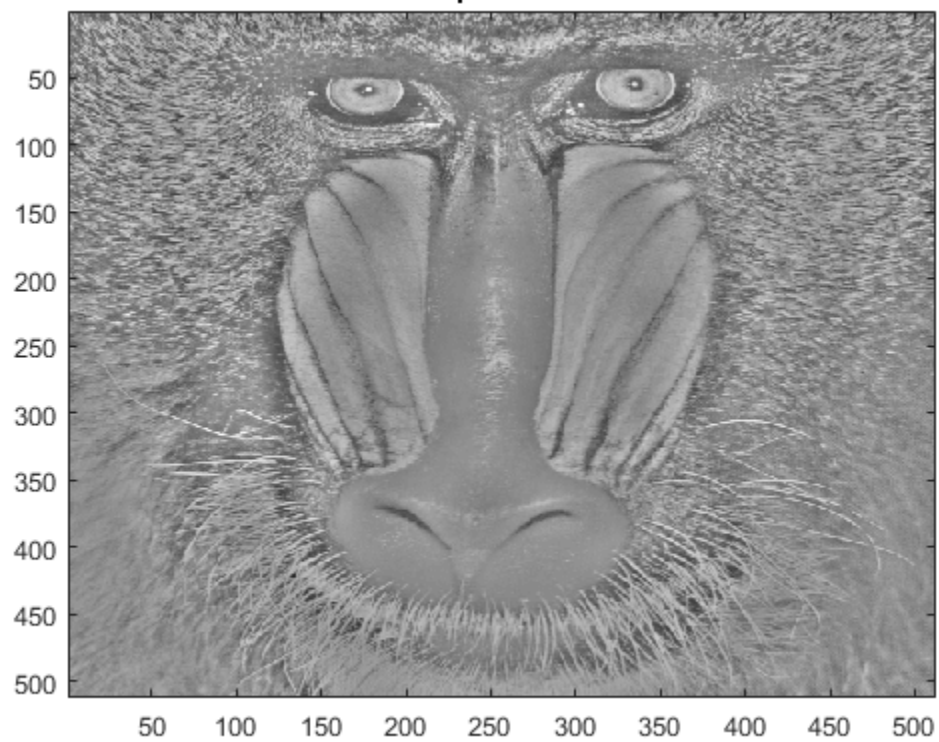
baboon passe haut 4

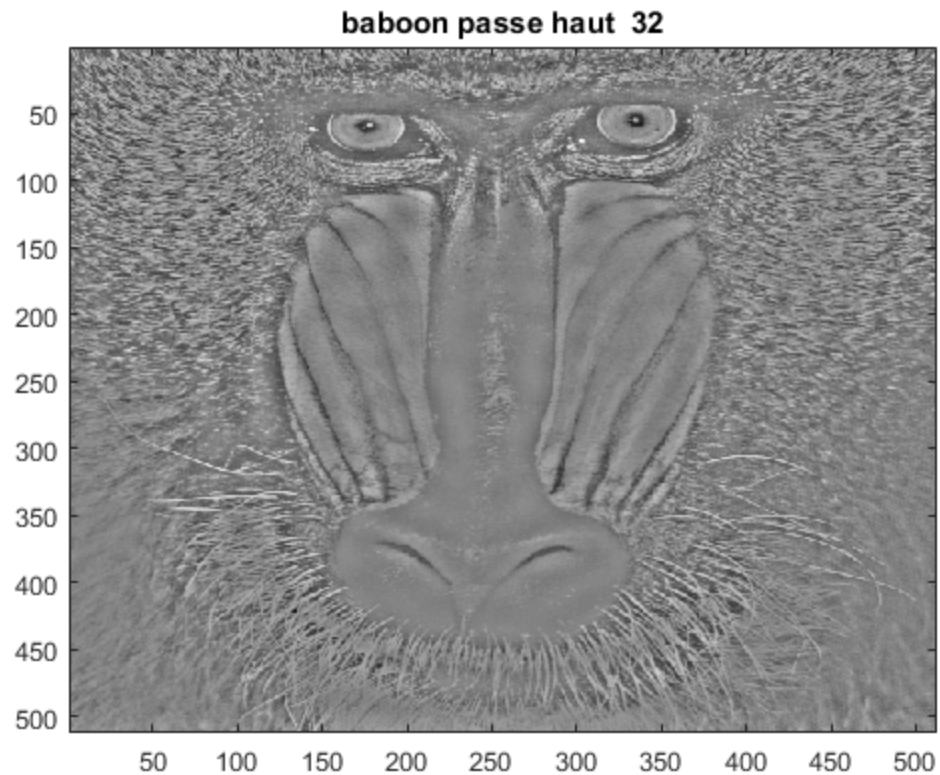


baboon passe haut 8



baboon passe haut 16



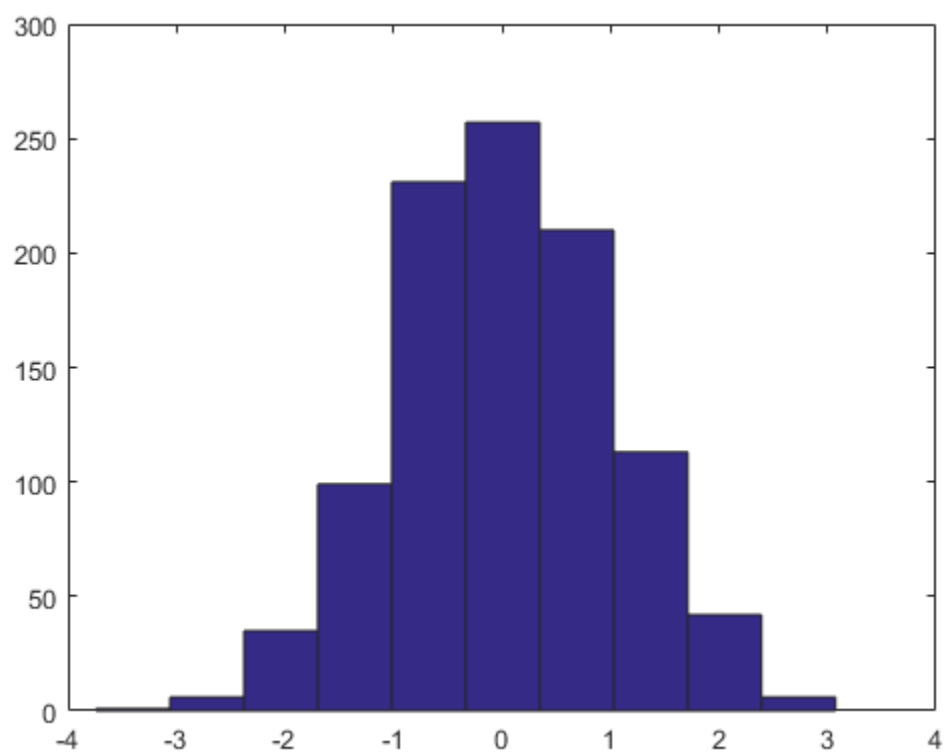
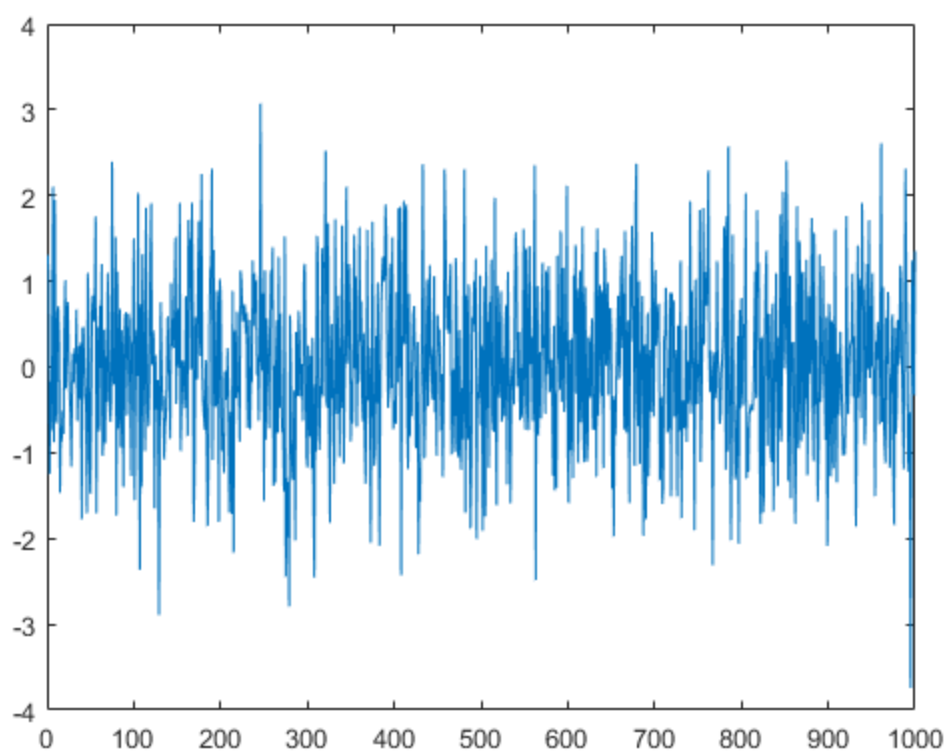


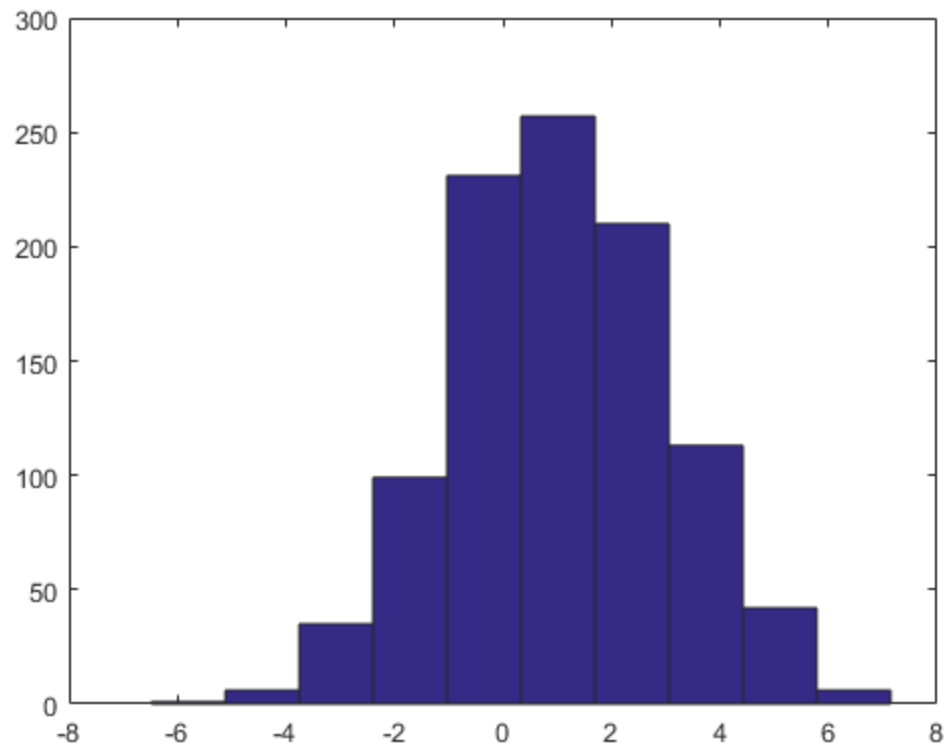
Probabilité

```
% *****
% *****          Probabilité
% *****
% *****

T = 1000;
x = randn(1,T);
figure; plot(x);
figure(); hist(x);
z = 2*x + 1; figure(); hist(z);

%%Definition des fonctions
% *****          Definition des fonctions *****
```





Fonction passeBas:

cette fonction prend en paramètre l'image et la taille de masque de filtrage puis retourne l'image filtré

Fonction passeHaut :

Similaire principe avec le filtre passe bas , mais il retourne l'image filtré en haute frréquence.

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