

メディアンフィルタを3回通し、どのフィルタの順番が最もMSEが小さくなるかの検討

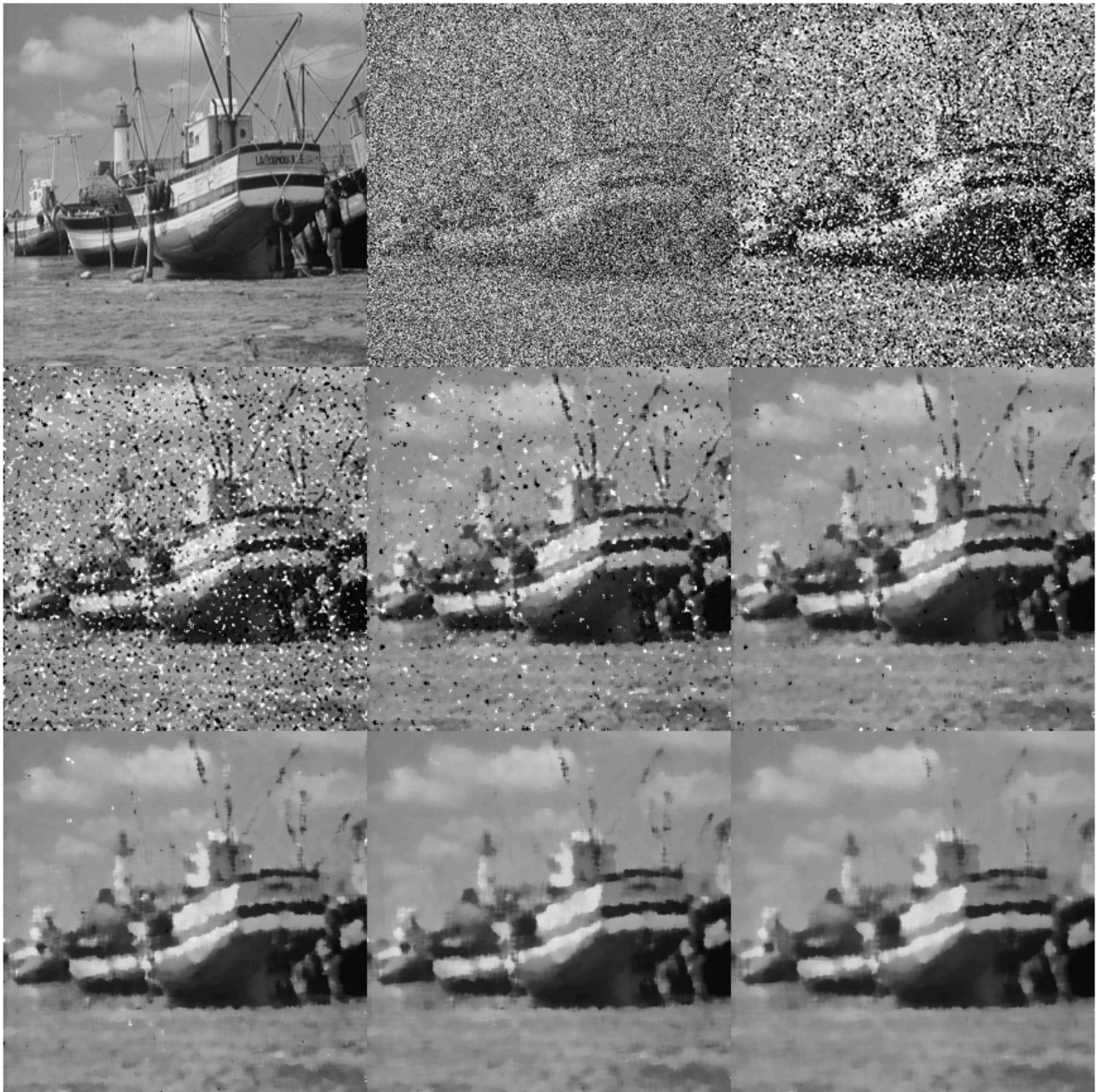
・メディアンフィルタ(3\*3)を1回処理し、2回目、3回目に各メディアンフィルタを処理した時のそれぞれのMSEの比較

```
R=imread('rdata4.bmp'); %原画像
I=imread('idata4.bmp'); %ノイズ付き画像
figure;
KmedianZa = medfilt2(I,[3 3],"symmetric"); %確認であるので、ライブラリを使用して処理する
KmedianZa3 = medfilt2(KmedianZa,[3 3],"symmetric");
KmedianZa5 = medfilt2(KmedianZa,[5 5],"symmetric");
KmedianZa7 = medfilt2(KmedianZa,[7 7],"symmetric");
KmedianZa9 = medfilt2(KmedianZa,[9 9],"symmetric");
KmedianZa11 = medfilt2(KmedianZa,[11 11],"symmetric");
KmedianZa13 = medfilt2(KmedianZa,[13 13],"symmetric");
KmedianZa15 = medfilt2(KmedianZa,[15 15],"symmetric");
KmedianZa33 = medfilt2(KmedianZa3,[3 3],"symmetric");
KmedianZa35 = medfilt2(KmedianZa3,[5 5],"symmetric");
KmedianZa37 = medfilt2(KmedianZa3,[7 7],"symmetric");
KmedianZa39 = medfilt2(KmedianZa3,[9 9],"symmetric");
KmedianZa311 = medfilt2(KmedianZa3,[11 11],"symmetric");
KmedianZa313 = medfilt2(KmedianZa3,[13 13],"symmetric");
KmedianZa315 = medfilt2(KmedianZa3,[15 15],"symmetric");
KmedianZa53 = medfilt2(KmedianZa5,[3 3],"symmetric");
KmedianZa55 = medfilt2(KmedianZa5,[5 5],"symmetric");
KmedianZa57 = medfilt2(KmedianZa5,[7 7],"symmetric");
KmedianZa59 = medfilt2(KmedianZa5,[9 9],"symmetric");
KmedianZa511 = medfilt2(KmedianZa5,[11 11],"symmetric");
KmedianZa513 = medfilt2(KmedianZa5,[13 13],"symmetric");
KmedianZa515 = medfilt2(KmedianZa5,[15 15],"symmetric");
KmedianZa73 = medfilt2(KmedianZa7,[3 3],"symmetric");
KmedianZa75 = medfilt2(KmedianZa7,[5 5],"symmetric");
KmedianZa77 = medfilt2(KmedianZa7,[7 7],"symmetric");
KmedianZa79 = medfilt2(KmedianZa7,[9 9],"symmetric");
KmedianZa711 = medfilt2(KmedianZa7,[11 11],"symmetric");
KmedianZa713 = medfilt2(KmedianZa7,[13 13],"symmetric");
KmedianZa715 = medfilt2(KmedianZa7,[15 15],"symmetric");
KmedianZa93 = medfilt2(KmedianZa9,[3 3],"symmetric");
KmedianZa95 = medfilt2(KmedianZa9,[5 5],"symmetric");
KmedianZa97 = medfilt2(KmedianZa9,[7 7],"symmetric");
KmedianZa99 = medfilt2(KmedianZa9,[9 9],"symmetric");
KmedianZa911 = medfilt2(KmedianZa9,[11 11],"symmetric");
KmedianZa913 = medfilt2(KmedianZa9,[13 13],"symmetric");
KmedianZa915 = medfilt2(KmedianZa9,[15 15],"symmetric");
KmedianZa113 = medfilt2(KmedianZa11,[3 3],"symmetric");
KmedianZa115 = medfilt2(KmedianZa11,[5 5],"symmetric");
KmedianZa117 = medfilt2(KmedianZa11,[7 7],"symmetric");
KmedianZa119 = medfilt2(KmedianZa11,[9 9],"symmetric");
KmedianZa1111 = medfilt2(KmedianZa11,[11 11],"symmetric");
KmedianZa1113 = medfilt2(KmedianZa11,[13 13],"symmetric");
KmedianZa1115 = medfilt2(KmedianZa11,[15 15],"symmetric");
KmedianZa133 = medfilt2(KmedianZa13,[3 3],"symmetric");
KmedianZa135 = medfilt2(KmedianZa13,[5 5],"symmetric");
KmedianZa137 = medfilt2(KmedianZa13,[7 7],"symmetric");
```

```

KmedianZa139 = medfilt2(KmedianZa13,[9 9],"symmetric");
KmedianZa1311 = medfilt2(KmedianZa13,[11 11],"symmetric");
KmedianZa1313 = medfilt2(KmedianZa13,[13 13],"symmetric");
KmedianZa1315 = medfilt2(KmedianZa13,[15 15],"symmetric");
KmedianZa153 = medfilt2(KmedianZa15,[3 3],"symmetric");
KmedianZa155 = medfilt2(KmedianZa15,[5 5],"symmetric");
KmedianZa157 = medfilt2(KmedianZa15,[7 7],"symmetric");
KmedianZa159 = medfilt2(KmedianZa15,[9 9],"symmetric");
KmedianZa1511 = medfilt2(KmedianZa15,[11 11],"symmetric");
KmedianZa1513 = medfilt2(KmedianZa15,[13 13],"symmetric");
KmedianZa1515 = medfilt2(KmedianZa15,[15 15],"symmetric");
KmedianZb = medfilt2(I,[5 5],"symmetric");
KmedianZc = medfilt2(I,[7,7],"symmetric");
KmedianZd = medfilt2(I,[9 9],"symmetric");
KmedianZe = medfilt2(I,[11 11],"symmetric");
KmedianZf = medfilt2(I,[13 13],"symmetric");
KmedianZg = medfilt2(I,[15 15],"symmetric");
montage({R,I,KmedianZa,KmedianZb,KmedianZc,KmedianZd, ...
        KmedianZe,KmedianZf,KmedianZg})

```



```

erra = immse(R, KmedianZa);
fprintf('メディアンフィルタ(3*3)を施した時のMSE: %0.4f\n', erra);

```

メディアンフィルタ(3\*3)を施した時のMSE: 6467.2161

```

errb = immse(R, KmedianZb);
fprintf('メディアンフィルタ(5*5)を施した時のMSE: %0.4f\n', errb);

```

メディアンフィルタ(5\*5)を施した時のMSE: 2511.0627

```

errc = immse(R, KmedianZc);
fprintf('メディアンフィルタ(7*7)を施した時のMSE: %0.4f\n', errc);

```

メディアンフィルタ(7\*7)を施した時のMSE : 943.0500

```
errd = immse(R, KmedianZd);  
fprintf('メディアンフィルタ(9*9)を施した時のMSE : %0.4f\n', errd);
```

メディアンフィルタ(9\*9)を施した時のMSE : 532.0712

```
erre = immse(R, KmedianZe);  
fprintf('メディアンフィルタ(11*11)を施した時のMSE : %0.4f\n', erre);
```

メディアンフィルタ(11\*11)を施した時のMSE : 449.1207

```
errf = immse(R, KmedianZf);  
fprintf('メディアンフィルタ(13*13)を施した時のMSE : %0.4f\n', errf);
```

メディアンフィルタ(13\*13)を施した時のMSE : 448.9078

```
errg = immse(R, KmedianZg);  
fprintf('メディアンフィルタ(15*15)を施した時のMSE : %0.4f\n', errg);
```

メディアンフィルタ(15\*15)を施した時のMSE : 463.2193

```
erra3 = immse(R, KmedianZa3);  
fprintf('MSE : %0.4f\n', erra3);
```

MSE : 3993.2284

```
erra5 = immse(R, KmedianZa5);  
fprintf('MSE : %0.4f\n', erra5);
```

MSE : 1688.7530

```
erra7 = immse(R, KmedianZa7);  
fprintf('MSE : %0.4f\n', erra7);
```

MSE : 687.4831

```
erra9 = immse(R, KmedianZa9);  
fprintf('MSE : %0.4f\n', erra9);
```

MSE : 464.0428

```
erra11 = immse(R, KmedianZa11);  
fprintf('MSE : %0.4f\n', erra11);
```

MSE : 424.8224

```
erra13 = immse(R, KmedianZa13);  
fprintf('MSE : %0.4f\n', erra13);
```

MSE : 435.2463

```
erra15 = immse(R, KmedianZa15);  
fprintf('MSE : %0.4f\n', erra15);
```

MSE : 452.1395

```
erra33 = immse(R, KmedianZa33);  
fprintf('MSE : %0.4f\n', erra33);
```

MSE : 2886.9540

```
erra35 = immse(R, KmedianZa35);  
fprintf('MSE : %0.4f\n', erra35);
```

MSE : 1384.3005

```
erra37 = immse(R, KmedianZa37);  
fprintf('MSE : %0.4f\n', erra37);
```

MSE : 630.6906

```
erra39 = immse(R, KmedianZa39);  
fprintf('MSE : %0.4f\n', erra39);
```

MSE : 442.4196

```
erra311 = immse(R, KmedianZa311);  
fprintf('MSE : %0.4f\n', erra311);
```

MSE : 415.7962

```
erra313 = immse(R, KmedianZa313);  
fprintf('MSE : %0.4f\n', erra313);
```

MSE : 428.0566

```
erra315 = immse(R, KmedianZa315);  
fprintf('MSE : %0.4f\n', erra315);
```

MSE : 446.9558

```
erra53 = immse(R, KmedianZa53);  
fprintf('MSE : %0.4f\n', erra53);
```

MSE : 1328.4518

```
erra55 = immse(R, KmedianZa55);  
fprintf('MSE : %0.4f\n', erra55);
```

MSE : 820.3558

```
erra57 = immse(R, KmedianZa57);  
fprintf('MSE : %0.4f\n', erra57);
```

MSE : 505.7275

```
erra59 = immse(R, KmedianZa59);  
fprintf('MSE : %0.4f\n', erra59);
```

MSE : 404.2606

```
erra511 = immse(R, KmedianZa511);
```

```
fprintf('MSE : %0.4f\n', erra511);
```

MSE : 398.1968

```
erra513 = immse(R, KmedianZa513);  
fprintf('MSE : %0.4f\n', erra513);
```

MSE : 411.4620

```
erra515 = immse(R, KmedianZa515);  
fprintf('MSE : %0.4f\n', erra515);
```

MSE : 431.6943

```
erra73 = immse(R, KmedianZa73);  
fprintf('MSE : %0.4f\n', erra73);
```

MSE : 591.2346

```
erra75 = immse(R, KmedianZa75);  
fprintf('MSE : %0.4f\n', erra75);
```

MSE : 474.7695

```
erra77 = immse(R, KmedianZa77);  
fprintf('MSE : %0.4f\n', erra77);
```

MSE : 398.1023

```
erra79 = immse(R, KmedianZa79);  
fprintf('MSE : %0.4f\n', erra79);
```

MSE : 374.4915

```
erra711 = immse(R, KmedianZa711);  
fprintf('MSE : %0.4f\n', erra711);
```

MSE : 381.5347

```
erra713 = immse(R, KmedianZa713);  
fprintf('MSE : %0.4f\n', erra713);
```

MSE : 398.9748

```
erra715 = immse(R, KmedianZa715);  
fprintf('MSE : %0.4f\n', erra715);
```

MSE : 419.8160

```
erra93 = immse(R, KmedianZa93);  
fprintf('MSE : %0.4f\n', erra93);
```

MSE : 436.8147

```
erra95 = immse(R, KmedianZa95);  
fprintf('MSE : %0.4f\n', erra95);
```



MSE : 399.5802

```
erra97 = immse(R, KmedianZa97);  
fprintf('MSE : %0.4f\n', erra97);
```

MSE : 382.1091

```
erra99 = immse(R, KmedianZa99);  
fprintf('MSE : %0.4f\n', erra99);
```

MSE : 376.8509

```
erra911 = immse(R, KmedianZa911);  
fprintf('MSE : %0.4f\n', erra911);
```

MSE : 385.5234

```
erra913 = immse(R, KmedianZa913);  
fprintf('MSE : %0.4f\n', erra913);
```

MSE : 400.0669

```
erra915 = immse(R, KmedianZa915);  
fprintf('MSE : %0.4f\n', erra915);
```

MSE : 418.3381

```
erra113 = immse(R, KmedianZa113);  
fprintf('MSE : %0.4f\n', erra113);
```

MSE : 415.9487

```
erra115 = immse(R, KmedianZa115);  
fprintf('MSE : %0.4f\n', erra115);
```

MSE : 404.0790

```
erra117 = immse(R, KmedianZa117);  
fprintf('MSE : %0.4f\n', erra117);
```

MSE : 396.4964

```
erra119 = immse(R, KmedianZa119);  
fprintf('MSE : %0.4f\n', erra119);
```

MSE : 394.2339

```
erra1111 = immse(R, KmedianZa1111);  
fprintf('MSE : %0.4f\n', erra1111);
```

MSE : 398.5570

```
erra1113 = immse(R, KmedianZa1113);  
fprintf('MSE : %0.4f\n', erra1113);
```

MSE : 409.4380

```
erra1115 = immse(R, KmedianZa1115);  
fprintf('MSE : %0.4f\n', erra1115);
```

MSE : 424.3476

```
erra133 = immse(R, KmedianZa133);  
fprintf('MSE : %0.4f\n', erra133);
```

MSE : 430.8778

```
erra135 = immse(R, KmedianZa135);  
fprintf('MSE : %0.4f\n', erra135);
```

MSE : 423.9878

```
erra137 = immse(R, KmedianZa137);  
fprintf('MSE : %0.4f\n', erra137);
```

MSE : 418.6082

```
erra139 = immse(R, KmedianZa139);  
fprintf('MSE : %0.4f\n', erra139);
```

MSE : 416.5921

```
erra1311 = immse(R, KmedianZa1311);  
fprintf('MSE : %0.4f\n', erra1311);
```

MSE : 419.0364

```
erra1313 = immse(R, KmedianZa1313);  
fprintf('MSE : %0.4f\n', erra1313);
```

MSE : 425.7060

```
erra1315 = immse(R, KmedianZa1315);  
fprintf('MSE : %0.4f\n', erra1315);
```

MSE : 436.9546

```
erra153 = immse(R, KmedianZa153);  
fprintf('MSE : %0.4f\n', erra153);
```

MSE : 449.4382

```
erra155 = immse(R, KmedianZa155);  
fprintf('MSE : %0.4f\n', erra155);
```

MSE : 445.3473

```
erra157 = immse(R, KmedianZa157);  
fprintf('MSE : %0.4f\n', erra157);
```

MSE : 441.8859

```
erra159 = immse(R, KmedianZa159);
```



```
fprintf('MSE : %0.4f\n', erra159);
```

MSE : 440.1666

```
erra1511 = immse(R, KmedianZa1511);  
fprintf('MSE : %0.4f\n', erra1511);
```

MSE : 441.1216

```
erra1513 = immse(R, KmedianZa1513);  
fprintf('MSE : %0.4f\n', erra1513);
```

MSE : 445.1518

```
erra1515 = immse(R, KmedianZa1515);  
fprintf('MSE : %0.4f\n', erra1515);
```

MSE : 453.1164

montage({R,KmedianZa79})%この中で最も小さいMSE(=578.2)の画像 %3\*3,7\*7,9\*9の順



- ・メディアンフィルタ(5\*5)を1回処理し,2回目,3回目に各メディアンフィルタを処理した時のそれぞれのMSEの比較

```
KmedianZb = medfilt2(I,[5 5],"symmetric");  
KmedianZb3 = medfilt2(KmedianZb,[3 3],"symmetric");  
KmedianZb5 = medfilt2(KmedianZb,[5 5],"symmetric");  
KmedianZb7 = medfilt2(KmedianZb,[7 7],"symmetric");  
KmedianZb9 = medfilt2(KmedianZb,[9 9],"symmetric");  
KmedianZb11 = medfilt2(KmedianZb,[11 11],"symmetric");  
KmedianZb13 = medfilt2(KmedianZb,[13 13],"symmetric");  
KmedianZb15 = medfilt2(KmedianZb,[15 15],"symmetric");
```

```

KmedianZb33 = medfilt2(KmedianZb3,[3 3],"symmetric");
KmedianZb35 = medfilt2(KmedianZb3,[5 5],"symmetric");
KmedianZb37 = medfilt2(KmedianZb3,[7 7],"symmetric");
KmedianZb39 = medfilt2(KmedianZb3,[9 9],"symmetric");
KmedianZb311 = medfilt2(KmedianZb3,[11 11],"symmetric");
KmedianZb313 = medfilt2(KmedianZb3,[13 13],"symmetric");
KmedianZb315 = medfilt2(KmedianZb3,[15 15],"symmetric");
KmedianZb53 = medfilt2(KmedianZb5,[3 3],"symmetric");
KmedianZb55 = medfilt2(KmedianZb5,[5 5],"symmetric");
KmedianZb57 = medfilt2(KmedianZb5,[7 7],"symmetric");
KmedianZb59 = medfilt2(KmedianZb5,[9 9],"symmetric");
KmedianZb511 = medfilt2(KmedianZb5,[11 11],"symmetric");
KmedianZb513 = medfilt2(KmedianZb5,[13 13],"symmetric");
KmedianZb515 = medfilt2(KmedianZb5,[15 15],"symmetric");
KmedianZb73 = medfilt2(KmedianZb7,[3 3],"symmetric");
KmedianZb75 = medfilt2(KmedianZb7,[5 5],"symmetric");
KmedianZb77 = medfilt2(KmedianZb7,[7 7],"symmetric");
KmedianZb79 = medfilt2(KmedianZb7,[9 9],"symmetric");
KmedianZb711 = medfilt2(KmedianZb7,[11 11],"symmetric");
KmedianZb713 = medfilt2(KmedianZb7,[13 13],"symmetric");
KmedianZb715 = medfilt2(KmedianZb7,[15 15],"symmetric");
KmedianZb93 = medfilt2(KmedianZb9,[3 3],"symmetric");
KmedianZb95 = medfilt2(KmedianZb9,[5 5],"symmetric");
KmedianZb97 = medfilt2(KmedianZb9,[7 7],"symmetric");
KmedianZb99 = medfilt2(KmedianZb9,[9 9],"symmetric");
KmedianZb911 = medfilt2(KmedianZb9,[11 11],"symmetric");
KmedianZb913 = medfilt2(KmedianZb9,[13 13],"symmetric");
KmedianZb915 = medfilt2(KmedianZb9,[15 15],"symmetric");
KmedianZb113 = medfilt2(KmedianZb11,[3 3],"symmetric");
KmedianZb115 = medfilt2(KmedianZb11,[5 5],"symmetric");
KmedianZb117 = medfilt2(KmedianZb11,[7 7],"symmetric");
KmedianZb119 = medfilt2(KmedianZb11,[9 9],"symmetric");
KmedianZb1111 = medfilt2(KmedianZb11,[11 11],"symmetric");
KmedianZb1113 = medfilt2(KmedianZb11,[13 13],"symmetric");
KmedianZb1115 = medfilt2(KmedianZb11,[15 15],"symmetric");
KmedianZb133 = medfilt2(KmedianZb13,[3 3],"symmetric");
KmedianZb135 = medfilt2(KmedianZb13,[5 5],"symmetric");
KmedianZb137 = medfilt2(KmedianZb13,[7 7],"symmetric");
KmedianZb139 = medfilt2(KmedianZb13,[9 9],"symmetric");
KmedianZb1311 = medfilt2(KmedianZb13,[11 11],"symmetric");
KmedianZb1313 = medfilt2(KmedianZb13,[13 13],"symmetric");
KmedianZb1315 = medfilt2(KmedianZb13,[15 15],"symmetric");
KmedianZb153 = medfilt2(KmedianZb15,[3 3],"symmetric");
KmedianZb155 = medfilt2(KmedianZb15,[5 5],"symmetric");
KmedianZb157 = medfilt2(KmedianZb15,[7 7],"symmetric");
KmedianZb159 = medfilt2(KmedianZb15,[9 9],"symmetric");
KmedianZb1511 = medfilt2(KmedianZb15,[11 11],"symmetric");
KmedianZb1513 = medfilt2(KmedianZb15,[13 13],"symmetric");
KmedianZb1515 = medfilt2(KmedianZb15,[15 15],"symmetric");

errb3 = immse(R, KmedianZb3);
fprintf('MSE : %0.4f\n', errb3);

```

MSE : 1531.8901

```
errb5 = immse(R, KmedianZb5);  
fprintf('MSE : %0.4f\n', errb5);
```

MSE : 858.1459

```
errb7 = immse(R, KmedianZb7);  
fprintf('MSE : %0.4f\n', errb7);
```

MSE : 501.0550

```
errb9 = immse(R, KmedianZb9);  
fprintf('MSE : %0.4f\n', errb9);
```

MSE : 396.9814

```
errb11 = immse(R, KmedianZb11);  
fprintf('MSE : %0.4f\n', errb11);
```

MSE : 392.2162

```
errb13 = immse(R, KmedianZb13);  
fprintf('MSE : %0.4f\n', errb13);
```

MSE : 411.0406

```
errb15 = immse(R, KmedianZb15);  
fprintf('MSE : %0.4f\n', errb15);
```

MSE : 432.6572

```
errb33 = immse(R, KmedianZb33);  
fprintf('MSE : %0.4f\n', errb33);
```

MSE : 1206.2821

```
errb35 = immse(R, KmedianZb35);  
fprintf('MSE : %0.4f\n', errb35);
```

MSE : 737.5221

```
errb37 = immse(R, KmedianZb37);  
fprintf('MSE : %0.4f\n', errb37);
```

MSE : 477.4325

```
errb39 = immse(R, KmedianZb39);  
fprintf('MSE : %0.4f\n', errb39);
```

MSE : 392.5694

```
errb311 = immse(R, KmedianZb311);  
fprintf('MSE : %0.4f\n', errb311);
```

MSE : 387.7821

```
errb313 = immse(R, KmedianZb313);  
fprintf('MSE : %0.4f\n', errb313);
```

MSE : 407.1090

```
errb315 = immse(R, KmedianZb315);  
fprintf('MSE : %0.4f\n', errb315);
```

MSE : 428.6922

```
errb53 = immse(R, KmedianZb53);  
fprintf('MSE : %0.4f\n', errb53);
```

MSE : 733.6941

```
errb55 = immse(R, KmedianZb55);  
fprintf('MSE : %0.4f\n', errb55);
```

MSE : 546.5762

```
errb57 = immse(R, KmedianZb57);  
fprintf('MSE : %0.4f\n', errb57);
```

MSE : 418.6216

```
errb59 = immse(R, KmedianZb59);  
fprintf('MSE : %0.4f\n', errb59);
```

MSE : 376.0974

```
errb511 = immse(R, KmedianZb511);  
fprintf('MSE : %0.4f\n', errb511);
```

MSE : 380.3314

```
errb513 = immse(R, KmedianZb513);  
fprintf('MSE : %0.4f\n', errb513);
```

MSE : 400.8693

```
errb515 = immse(R, KmedianZb515);  
fprintf('MSE : %0.4f\n', errb515);
```

MSE : 422.0153

```
errb73 = immse(R, KmedianZb73);  
fprintf('MSE : %0.4f\n', errb73);
```

MSE : 470.2277

```
errb75 = immse(R, KmedianZb75);  
fprintf('MSE : %0.4f\n', errb75);
```

MSE : 415.6606

```
errb77 = immse(R, KmedianZb77);  
fprintf('MSE : %0.4f\n', errb77);
```

MSE : 376.5629

```
errb79 = immse(R, KmedianZb79);  
fprintf('MSE : %0.4f\n', errb79);
```

MSE : 365.2094

```
errb711 = immse(R, KmedianZb711);  
fprintf('MSE : %0.4f\n', errb711);
```

MSE : 377.4145

```
errb713 = immse(R, KmedianZb713);  
fprintf('MSE : %0.4f\n', errb713);
```

MSE : 396.9891

```
errb715 = immse(R, KmedianZb715);  
fprintf('MSE : %0.4f\n', errb715);
```

MSE : 417.5760

```
errb93 = immse(R, KmedianZb93);  
fprintf('MSE : %0.4f\n', errb93);
```

MSE : 388.2526

```
errb95 = immse(R, KmedianZb95);  
fprintf('MSE : %0.4f\n', errb95);
```

MSE : 375.6967

```
errb97 = immse(R, KmedianZb97);  
fprintf('MSE : %0.4f\n', errb97);
```

MSE : 368.4649

```
errb99 = immse(R, KmedianZb99);  
fprintf('MSE : %0.4f\n', errb99);
```

MSE : 371.5747

```
errb911 = immse(R, KmedianZb911);  
fprintf('MSE : %0.4f\n', errb911);
```

MSE : 381.5934

```
errb913 = immse(R, KmedianZb913);  
fprintf('MSE : %0.4f\n', errb913);
```

MSE : 397.1843

```
errb915 = immse(R, KmedianZb915);  
fprintf('MSE : %0.4f\n', errb915);
```

MSE : 416.3918

```
errb113 = immse(R, KmedianZb113);
```

```
fprintf('MSE : %0.4f\n', errb113);
```

MSE : 389.7335

```
errb115 = immse(R, KmedianZb115);  
fprintf('MSE : %0.4f\n', errb115);
```

MSE : 385.2758

```
errb117 = immse(R, KmedianZb117);  
fprintf('MSE : %0.4f\n', errb117);
```

MSE : 383.8244

```
errb119 = immse(R, KmedianZb119);  
fprintf('MSE : %0.4f\n', errb119);
```

MSE : 385.9105

```
errb1111 = immse(R, KmedianZb1111);  
fprintf('MSE : %0.4f\n', errb1111);
```

MSE : 394.1423

```
errb1113 = immse(R, KmedianZb1113);  
fprintf('MSE : %0.4f\n', errb1113);
```

MSE : 406.0925

```
errb1115 = immse(R, KmedianZb1115);  
fprintf('MSE : %0.4f\n', errb1115);
```

MSE : 421.6538

```
errb133 = immse(R, KmedianZb133);  
fprintf('MSE : %0.4f\n', errb133);
```

MSE : 409.7262

```
errb135 = immse(R, KmedianZb135);  
fprintf('MSE : %0.4f\n', errb135);
```

MSE : 407.5118

```
errb137 = immse(R, KmedianZb137);  
fprintf('MSE : %0.4f\n', errb137);
```

MSE : 406.8081

```
errb139 = immse(R, KmedianZb139);  
fprintf('MSE : %0.4f\n', errb139);
```

MSE : 407.6231

```
errb1311 = immse(R, KmedianZb1311);  
fprintf('MSE : %0.4f\n', errb1311);
```

MSE : 412.5522

```
errb1313 = immse(R, KmedianZb1313);  
fprintf('MSE : %0.4f\n', errb1313);
```

MSE : 420.9821

```
errb1315 = immse(R, KmedianZb1315);  
fprintf('MSE : %0.4f\n', errb1315);
```

MSE : 433.0515

```
errb153 = immse(R, KmedianZb153);  
fprintf('MSE : %0.4f\n', errb153);
```

MSE : 432.0504

```
errb155 = immse(R, KmedianZb155);  
fprintf('MSE : %0.4f\n', errb155);
```

MSE : 430.0218

```
errb157 = immse(R, KmedianZb157);  
fprintf('MSE : %0.4f\n', errb157);
```

MSE : 428.9053

```
errb159 = immse(R, KmedianZb159);  
fprintf('MSE : %0.4f\n', errb159);
```

MSE : 429.4490

```
errb1511 = immse(R, KmedianZb1511);  
fprintf('MSE : %0.4f\n', errb1511);
```

MSE : 432.0478

```
errb1513 = immse(R, KmedianZb1513);  
fprintf('MSE : %0.4f\n', errb1513);
```

MSE : 438.0363

```
errb1515 = immse(R, KmedianZb1515);  
fprintf('MSE : %0.4f\n', errb1515);
```

MSE : 447.2158

これらの中で最も小さいMSEは3\*3,7\*7,9\*9の順に処理したものである.

・メディアンフィルタ(7\*7)を1回処理し,2回目,3回目に各メディアンフィルタを処理した時のそれぞれのMSEの比較

```
KmedianZc = medfilt2(I,[7 7],"symmetric");  
KmedianZc3 = medfilt2(KmedianZc,[3 3],"symmetric");  
KmedianZc5 = medfilt2(KmedianZc,[5 5],"symmetric");  
KmedianZc7 = medfilt2(KmedianZc,[7 7],"symmetric");
```



```

KmedianZc9 = medfilt2(KmedianZc,[9 9],"symmetric");
KmedianZc11 = medfilt2(KmedianZc,[11 11],"symmetric");
KmedianZc13 = medfilt2(KmedianZc,[13 13],"symmetric");
KmedianZc15 = medfilt2(KmedianZc,[15 15],"symmetric");
KmedianZc33 = medfilt2(KmedianZc3,[3 3],"symmetric");
KmedianZc35 = medfilt2(KmedianZc3,[5 5],"symmetric");
KmedianZc37 = medfilt2(KmedianZc3,[7 7],"symmetric");
KmedianZc39 = medfilt2(KmedianZc3,[9 9],"symmetric");
KmedianZc311 = medfilt2(KmedianZc3,[11 11],"symmetric");
KmedianZc313 = medfilt2(KmedianZc3,[13 13],"symmetric");
KmedianZc315 = medfilt2(KmedianZc3,[15 15],"symmetric");
KmedianZc53 = medfilt2(KmedianZc5,[3 3],"symmetric");
KmedianZc55 = medfilt2(KmedianZc5,[5 5],"symmetric");
KmedianZc57 = medfilt2(KmedianZc5,[7 7],"symmetric");
KmedianZc59 = medfilt2(KmedianZc5,[9 9],"symmetric");
KmedianZc511 = medfilt2(KmedianZc5,[11 11],"symmetric");
KmedianZc513 = medfilt2(KmedianZc5,[13 13],"symmetric");
KmedianZc515 = medfilt2(KmedianZc5,[15 15],"symmetric");
KmedianZc73 = medfilt2(KmedianZc7,[3 3],"symmetric");
KmedianZc75 = medfilt2(KmedianZc7,[5 5],"symmetric");
KmedianZc77 = medfilt2(KmedianZc7,[7 7],"symmetric");
KmedianZc79 = medfilt2(KmedianZc7,[9 9],"symmetric");
KmedianZc711 = medfilt2(KmedianZc7,[11 11],"symmetric");
KmedianZc713 = medfilt2(KmedianZc7,[13 13],"symmetric");
KmedianZc715 = medfilt2(KmedianZc7,[15 15],"symmetric");
KmedianZc93 = medfilt2(KmedianZc9,[3 3],"symmetric");
KmedianZc95 = medfilt2(KmedianZc9,[5 5],"symmetric");
KmedianZc97 = medfilt2(KmedianZc9,[7 7],"symmetric");
KmedianZc99 = medfilt2(KmedianZc9,[9 9],"symmetric");
KmedianZc911 = medfilt2(KmedianZc9,[11 11],"symmetric");
KmedianZc913 = medfilt2(KmedianZc9,[13 13],"symmetric");
KmedianZc915 = medfilt2(KmedianZc9,[15 15],"symmetric");
KmedianZc113 = medfilt2(KmedianZc11,[3 3],"symmetric");
KmedianZc115 = medfilt2(KmedianZc11,[5 5],"symmetric");
KmedianZc117 = medfilt2(KmedianZc11,[7 7],"symmetric");
KmedianZc119 = medfilt2(KmedianZc11,[9 9],"symmetric");
KmedianZc1111 = medfilt2(KmedianZc11,[11 11],"symmetric");
KmedianZc1113 = medfilt2(KmedianZc11,[13 13],"symmetric");
KmedianZc1115 = medfilt2(KmedianZc11,[15 15],"symmetric");
KmedianZc133 = medfilt2(KmedianZc13,[3 3],"symmetric");
KmedianZc135 = medfilt2(KmedianZc13,[5 5],"symmetric");
KmedianZc137 = medfilt2(KmedianZc13,[7 7],"symmetric");
KmedianZc139 = medfilt2(KmedianZc13,[9 9],"symmetric");
KmedianZc1311 = medfilt2(KmedianZc13,[11 11],"symmetric");
KmedianZc1313 = medfilt2(KmedianZc13,[13 13],"symmetric");
KmedianZc1315 = medfilt2(KmedianZc13,[15 15],"symmetric");
KmedianZc153 = medfilt2(KmedianZc15,[3 3],"symmetric");
KmedianZc155 = medfilt2(KmedianZc15,[5 5],"symmetric");
KmedianZc157 = medfilt2(KmedianZc15,[7 7],"symmetric");
KmedianZc159 = medfilt2(KmedianZc15,[9 9],"symmetric");
KmedianZc1511 = medfilt2(KmedianZc15,[11 11],"symmetric");
KmedianZc1513 = medfilt2(KmedianZc15,[13 13],"symmetric");
KmedianZc1515 = medfilt2(KmedianZc15,[15 15],"symmetric");

```

```
errc3 = immse(R, KmedianZc3);  
fprintf('MSE : %0.4f\n', errc3);
```

MSE : 645.7379

```
errc5 = immse(R, KmedianZc5);  
fprintf('MSE : %0.4f\n', errc5);
```

MSE : 480.5162

```
errc7 = immse(R, KmedianZc7);  
fprintf('MSE : %0.4f\n', errc7);
```

MSE : 395.8334

```
errc9 = immse(R, KmedianZc9);  
fprintf('MSE : %0.4f\n', errc9);
```

MSE : 370.4663

```
errc11 = immse(R, KmedianZc11);  
fprintf('MSE : %0.4f\n', errc11);
```

MSE : 379.7562

```
errc13 = immse(R, KmedianZc13);  
fprintf('MSE : %0.4f\n', errc13);
```

MSE : 399.1569

```
errc15 = immse(R, KmedianZc15);  
fprintf('MSE : %0.4f\n', errc15);
```

MSE : 420.7688

```
errc33 = immse(R, KmedianZc33);  
fprintf('MSE : %0.4f\n', errc33);
```

MSE : 568.3770

```
errc35 = immse(R, KmedianZc35);  
fprintf('MSE : %0.4f\n', errc35);
```

MSE : 457.3925

```
errc37 = immse(R, KmedianZc37);  
fprintf('MSE : %0.4f\n', errc37);
```

MSE : 388.6556

```
errc39 = immse(R, KmedianZc39);  
fprintf('MSE : %0.4f\n', errc39);
```

MSE : 370.7145

```
errc311 = immse(R, KmedianZc311);  
fprintf('MSE : %0.4f\n', errc311);
```

MSE : 379.8045

```
errc313 = immse(R, KmedianZc313);  
fprintf('MSE : %0.4f\n', errc313);
```

MSE : 398.7668

```
errc315 = immse(R, KmedianZc315);  
fprintf('MSE : %0.4f\n', errc315);
```

MSE : 419.6138

```
errc53 = immse(R, KmedianZc53);  
fprintf('MSE : %0.4f\n', errc53);
```

MSE : 454.4024

```
errc55 = immse(R, KmedianZc55);  
fprintf('MSE : %0.4f\n', errc55);
```

MSE : 405.8793

```
errc57 = immse(R, KmedianZc57);  
fprintf('MSE : %0.4f\n', errc57);
```

MSE : 370.8002

```
errc59 = immse(R, KmedianZc59);  
fprintf('MSE : %0.4f\n', errc59);
```

MSE : 366.1559

```
errc511 = immse(R, KmedianZc511);  
fprintf('MSE : %0.4f\n', errc511);
```

MSE : 378.2156

```
errc513 = immse(R, KmedianZc513);  
fprintf('MSE : %0.4f\n', errc513);
```

MSE : 396.9664

```
errc515 = immse(R, KmedianZc515);  
fprintf('MSE : %0.4f\n', errc515);
```

MSE : 417.2787

```
errc73 = immse(R, KmedianZc73);  
fprintf('MSE : %0.4f\n', errc73);
```

MSE : 386.3564

```
errc75 = immse(R, KmedianZc75);  
fprintf('MSE : %0.4f\n', errc75);
```

MSE : 372.8819

```
errc77 = immse(R, KmedianZc77);  
fprintf('MSE : %0.4f\n', errc77);
```

MSE : 365.3499

```
errc79 = immse(R, KmedianZc79);  
fprintf('MSE : %0.4f\n', errc79);
```

MSE : 367.5422

```
errc711 = immse(R, KmedianZc711);  
fprintf('MSE : %0.4f\n', errc711);
```

MSE : 378.5247

```
errc713 = immse(R, KmedianZc713);  
fprintf('MSE : %0.4f\n', errc713);
```

MSE : 396.9924

```
errc715 = immse(R, KmedianZc715);  
fprintf('MSE : %0.4f\n', errc715);
```

MSE : 416.7768

```
errc93 = immse(R, KmedianZc93);  
fprintf('MSE : %0.4f\n', errc93);
```

MSE : 369.3856

```
errc95 = immse(R, KmedianZc95);  
fprintf('MSE : %0.4f\n', errc95);
```

MSE : 367.9591

```
errc97 = immse(R, KmedianZc97);  
fprintf('MSE : %0.4f\n', errc97);
```

MSE : 368.9220

```
errc99 = immse(R, KmedianZc99);  
fprintf('MSE : %0.4f\n', errc99);
```

MSE : 374.1419

```
errc911 = immse(R, KmedianZc911);  
fprintf('MSE : %0.4f\n', errc911);
```

MSE : 385.1412

```
errc913 = immse(R, KmedianZc913);  
fprintf('MSE : %0.4f\n', errc913);
```

MSE : 400.5925

```
errc915 = immse(R, KmedianZc915);  
fprintf('MSE : %0.4f\n', errc915);
```

MSE : 417.8016

```
errc113 = immse(R, KmedianZc113);  
fprintf('MSE : %0.4f\n', errc113);
```

MSE : 379.3181

```
errc115 = immse(R, KmedianZc115);  
fprintf('MSE : %0.4f\n', errc115);
```

MSE : 379.6452

```
errc117 = immse(R, KmedianZc117);  
fprintf('MSE : %0.4f\n', errc117);
```

MSE : 381.7132

```
errc119 = immse(R, KmedianZc119);  
fprintf('MSE : %0.4f\n', errc119);
```

MSE : 387.0109

```
errc1111 = immse(R, KmedianZc1111);  
fprintf('MSE : %0.4f\n', errc1111);
```

MSE : 395.3444

```
errc1113 = immse(R, KmedianZc1113);  
fprintf('MSE : %0.4f\n', errc1113);
```

MSE : 407.3755

```
errc1115 = immse(R, KmedianZc1115);  
fprintf('MSE : %0.4f\n', errc1115);
```

MSE : 422.6002

```
errc133 = immse(R, KmedianZc133);  
fprintf('MSE : %0.4f\n', errc133);
```

MSE : 398.7769

```
errc135 = immse(R, KmedianZc135);  
fprintf('MSE : %0.4f\n', errc135);
```

MSE : 398.9255

```
errc137 = immse(R, KmedianZc137);  
fprintf('MSE : %0.4f\n', errc137);
```

MSE : 400.6315

```
errc139 = immse(R, KmedianZc139);  
fprintf('MSE : %0.4f\n', errc139);
```

MSE : 403.9822

```
errc1311 = immse(R, KmedianZc1311);  
fprintf('MSE : %0.4f\n', errc1311);
```

MSE : 409.9600

```
errc1313 = immse(R, KmedianZc1313);  
fprintf('MSE : %0.4f\n', errc1313);
```

MSE : 419.4509

```
errc1315 = immse(R, KmedianZc1315);  
fprintf('MSE : %0.4f\n', errc1315);
```

MSE : 431.5997

```
errc153 = immse(R, KmedianZc153);  
fprintf('MSE : %0.4f\n', errc153);
```

MSE : 420.5773

```
errc155 = immse(R, KmedianZc155);  
fprintf('MSE : %0.4f\n', errc155);
```

MSE : 420.5430

```
errc157 = immse(R, KmedianZc157);  
fprintf('MSE : %0.4f\n', errc157);
```

MSE : 421.3498

```
errc159 = immse(R, KmedianZc159);  
fprintf('MSE : %0.4f\n', errc159);
```

MSE : 423.3962

```
errc1511 = immse(R, KmedianZc1511);  
fprintf('MSE : %0.4f\n', errc1511);
```

MSE : 427.8382

```
errc1513 = immse(R, KmedianZc1513);  
fprintf('MSE : %0.4f\n', errc1513);
```

MSE : 434.6570

```
errc1515 = immse(R, KmedianZc1515);  
fprintf('MSE : %0.4f\n', errc1515);
```

MSE : 444.3075

・メディアンフィルタ(9\*9)を1回処理し,2回目,3回目に各メディアンフィルタを処理した時のそれぞれのMSEの比較

```
KmedianZd = medfilt2(I,[9 9],"symmetric");  
KmedianZd3 = medfilt2(KmedianZd,[3 3],"symmetric");  
KmedianZd5 = medfilt2(KmedianZd,[5 5],"symmetric");
```

```

KmedianZd7 = medfilt2(KmedianZd,[7 7],"symmetric");
KmedianZd9 = medfilt2(KmedianZd,[9 9],"symmetric");
KmedianZd11 = medfilt2(KmedianZd,[11 11],"symmetric");
KmedianZd13 = medfilt2(KmedianZd,[13 13],"symmetric");
KmedianZd15 = medfilt2(KmedianZd,[15 15],"symmetric");
KmedianZd33 = medfilt2(KmedianZd3,[3 3],"symmetric");
KmedianZd35 = medfilt2(KmedianZd3,[5 5],"symmetric");
KmedianZd37 = medfilt2(KmedianZd3,[7 7],"symmetric");
KmedianZd39 = medfilt2(KmedianZd3,[9 9],"symmetric");
KmedianZd311 = medfilt2(KmedianZd3,[11 11],"symmetric");
KmedianZd313 = medfilt2(KmedianZd3,[13 13],"symmetric");
KmedianZd315 = medfilt2(KmedianZd3,[15 15],"symmetric");
KmedianZd53 = medfilt2(KmedianZd5,[3 3],"symmetric");
KmedianZd55 = medfilt2(KmedianZd5,[5 5],"symmetric");
KmedianZd57 = medfilt2(KmedianZd5,[7 7],"symmetric");
KmedianZd59 = medfilt2(KmedianZd5,[9 9],"symmetric");
KmedianZd511 = medfilt2(KmedianZd5,[11 11],"symmetric");
KmedianZd513 = medfilt2(KmedianZd5,[13 13],"symmetric");
KmedianZd515 = medfilt2(KmedianZd5,[15 15],"symmetric");
KmedianZd73 = medfilt2(KmedianZd7,[3 3],"symmetric");
KmedianZd75 = medfilt2(KmedianZd7,[5 5],"symmetric");
KmedianZd77 = medfilt2(KmedianZd7,[7 7],"symmetric");
KmedianZd79 = medfilt2(KmedianZd7,[9 9],"symmetric");
KmedianZd711 = medfilt2(KmedianZd7,[11 11],"symmetric");
KmedianZd713 = medfilt2(KmedianZd7,[13 13],"symmetric");
KmedianZd715 = medfilt2(KmedianZd7,[15 15],"symmetric");
KmedianZd93 = medfilt2(KmedianZd9,[3 3],"symmetric");
KmedianZd95 = medfilt2(KmedianZd9,[5 5],"symmetric");
KmedianZd97 = medfilt2(KmedianZd9,[7 7],"symmetric");
KmedianZd99 = medfilt2(KmedianZd9,[9 9],"symmetric");
KmedianZd911 = medfilt2(KmedianZd9,[11 11],"symmetric");
KmedianZd913 = medfilt2(KmedianZd9,[13 13],"symmetric");
KmedianZd915 = medfilt2(KmedianZd9,[15 15],"symmetric");
KmedianZd113 = medfilt2(KmedianZd11,[3 3],"symmetric");
KmedianZd115 = medfilt2(KmedianZd11,[5 5],"symmetric");
KmedianZd117 = medfilt2(KmedianZd11,[7 7],"symmetric");
KmedianZd119 = medfilt2(KmedianZd11,[9 9],"symmetric");
KmedianZd1111 = medfilt2(KmedianZd11,[11 11],"symmetric");
KmedianZd1113 = medfilt2(KmedianZd11,[13 13],"symmetric");
KmedianZd1115 = medfilt2(KmedianZd11,[15 15],"symmetric");
KmedianZd133 = medfilt2(KmedianZd13,[3 3],"symmetric");
KmedianZd135 = medfilt2(KmedianZd13,[5 5],"symmetric");
KmedianZd137 = medfilt2(KmedianZd13,[7 7],"symmetric");
KmedianZd139 = medfilt2(KmedianZd13,[9 9],"symmetric");
KmedianZd1311 = medfilt2(KmedianZd13,[11 11],"symmetric");
KmedianZd1313 = medfilt2(KmedianZd13,[13 13],"symmetric");
KmedianZd1315 = medfilt2(KmedianZd13,[15 15],"symmetric");
KmedianZd153 = medfilt2(KmedianZd15,[3 3],"symmetric");
KmedianZd155 = medfilt2(KmedianZd15,[5 5],"symmetric");
KmedianZd157 = medfilt2(KmedianZd15,[7 7],"symmetric");
KmedianZd159 = medfilt2(KmedianZd15,[9 9],"symmetric");
KmedianZd1511 = medfilt2(KmedianZd15,[11 11],"symmetric");
KmedianZd1513 = medfilt2(KmedianZd15,[13 13],"symmetric");
KmedianZd1515 = medfilt2(KmedianZd15,[15 15],"symmetric");

```



```
errd3 = immse(R, KmedianZd3);  
fprintf('MSE : %0.4f\n', errd3);
```

MSE : 449.9375

```
errd5 = immse(R, KmedianZd5);  
fprintf('MSE : %0.4f\n', errd5);
```

MSE : 400.2030

```
errd7 = immse(R, KmedianZd7);  
fprintf('MSE : %0.4f\n', errd7);
```

MSE : 377.9444

```
errd9 = immse(R, KmedianZd9);  
fprintf('MSE : %0.4f\n', errd9);
```

MSE : 374.0417

```
errd11 = immse(R, KmedianZd11);  
fprintf('MSE : %0.4f\n', errd11);
```

MSE : 382.2246

```
errd13 = immse(R, KmedianZd13);  
fprintf('MSE : %0.4f\n', errd13);
```

MSE : 399.5840

```
errd15 = immse(R, KmedianZd15);  
fprintf('MSE : %0.4f\n', errd15);
```

MSE : 419.8428

```
errd33 = immse(R, KmedianZd33);  
fprintf('MSE : %0.4f\n', errd33);
```

MSE : 427.0164

```
errd35 = immse(R, KmedianZd35);  
fprintf('MSE : %0.4f\n', errd35);
```

MSE : 393.7563

```
errd37 = immse(R, KmedianZd37);  
fprintf('MSE : %0.4f\n', errd37);
```

MSE : 377.8794

```
errd39 = immse(R, KmedianZd39);  
fprintf('MSE : %0.4f\n', errd39);
```

MSE : 375.5365

```
errd311 = immse(R, KmedianZd311);  
fprintf('MSE : %0.4f\n', errd311);
```

MSE : 383.2899

```
errd313 = immse(R, KmedianZd313);  
fprintf('MSE : %0.4f\n', errd313);
```

MSE : 400.0360

```
errd315 = immse(R, KmedianZd315);  
fprintf('MSE : %0.4f\n', errd315);
```

MSE : 419.6598

```
errd53 = immse(R, KmedianZd53);  
fprintf('MSE : %0.4f\n', errd53);
```

MSE : 393.1725

```
errd55 = immse(R, KmedianZd55);  
fprintf('MSE : %0.4f\n', errd55);
```

MSE : 382.4957

```
errd57 = immse(R, KmedianZd57);  
fprintf('MSE : %0.4f\n', errd57);
```

MSE : 376.4061

```
errd59 = immse(R, KmedianZd59);  
fprintf('MSE : %0.4f\n', errd59);
```

MSE : 377.0677

```
errd511 = immse(R, KmedianZd511);  
fprintf('MSE : %0.4f\n', errd511);
```

MSE : 385.1318

```
errd513 = immse(R, KmedianZd513);  
fprintf('MSE : %0.4f\n', errd513);
```

MSE : 400.4807

```
errd515 = immse(R, KmedianZd515);  
fprintf('MSE : %0.4f\n', errd515);
```

MSE : 419.2410

```
errd73 = immse(R, KmedianZd73);  
fprintf('MSE : %0.4f\n', errd73);
```

MSE : 376.7887

```
errd75 = immse(R, KmedianZd75);  
fprintf('MSE : %0.4f\n', errd75);
```

MSE : 375.4699

```
errd77 = immse(R, KmedianZd77);
```

```
fprintf('MSE : %0.4f\n', errd77);
```

MSE : 375.3564

```
errd79 = immse(R, KmedianZd79);  
fprintf('MSE : %0.4f\n', errd79);
```

MSE : 378.4085

```
errd711 = immse(R, KmedianZd711);  
fprintf('MSE : %0.4f\n', errd711);
```

MSE : 388.1704

```
errd713 = immse(R, KmedianZd713);  
fprintf('MSE : %0.4f\n', errd713);
```

MSE : 402.4585

```
errd715 = immse(R, KmedianZd715);  
fprintf('MSE : %0.4f\n', errd715);
```

MSE : 420.5953

```
errd93 = immse(R, KmedianZd93);  
fprintf('MSE : %0.4f\n', errd93);
```

MSE : 374.5270

```
errd95 = immse(R, KmedianZd95);  
fprintf('MSE : %0.4f\n', errd95);
```

MSE : 376.4712

```
errd97 = immse(R, KmedianZd97);  
fprintf('MSE : %0.4f\n', errd97);
```

MSE : 378.7628

```
errd99 = immse(R, KmedianZd99);  
fprintf('MSE : %0.4f\n', errd99);
```

MSE : 385.0727

```
errd911 = immse(R, KmedianZd911);  
fprintf('MSE : %0.4f\n', errd911);
```

MSE : 394.3465

```
errd913 = immse(R, KmedianZd913);  
fprintf('MSE : %0.4f\n', errd913);
```

MSE : 407.9145

```
errd915 = immse(R, KmedianZd915);  
fprintf('MSE : %0.4f\n', errd915);
```

MSE : 424.1912

```
errd113 = immse(R, KmedianZd113);  
fprintf('MSE : %0.4f\n', errd113);
```

MSE : 382.6504

```
errd115 = immse(R, KmedianZd115);  
fprintf('MSE : %0.4f\n', errd115);
```

MSE : 385.0154

```
errd117 = immse(R, KmedianZd117);  
fprintf('MSE : %0.4f\n', errd117);
```

MSE : 388.9585

```
errd119 = immse(R, KmedianZd119);  
fprintf('MSE : %0.4f\n', errd119);
```

MSE : 394.7332

```
errd1111 = immse(R, KmedianZd1111);  
fprintf('MSE : %0.4f\n', errd1111);
```

MSE : 403.6846

```
errd1113 = immse(R, KmedianZd1113);  
fprintf('MSE : %0.4f\n', errd1113);
```

MSE : 415.0466

```
errd1115 = immse(R, KmedianZd1115);  
fprintf('MSE : %0.4f\n', errd1115);
```

MSE : 429.8478

```
errd133 = immse(R, KmedianZd133);  
fprintf('MSE : %0.4f\n', errd133);
```

MSE : 399.7555

```
errd135 = immse(R, KmedianZd135);  
fprintf('MSE : %0.4f\n', errd135);
```

MSE : 401.2392

```
errd137 = immse(R, KmedianZd137);  
fprintf('MSE : %0.4f\n', errd137);
```

MSE : 404.5267

```
errd139 = immse(R, KmedianZd139);  
fprintf('MSE : %0.4f\n', errd139);
```

MSE : 409.3459

```
errd1311 = immse(R, KmedianZd1311);  
fprintf('MSE : %0.4f\n', errd1311);
```

MSE : 416.7811

```
errd1313 = immse(R, KmedianZd1313);  
fprintf('MSE : %0.4f\n', errd1313);
```

MSE : 426.2882

```
errd1315 = immse(R, KmedianZd1315);  
fprintf('MSE : %0.4f\n', errd1315);
```

MSE : 438.6056

```
errd153 = immse(R, KmedianZd153);  
fprintf('MSE : %0.4f\n', errd153);
```

MSE : 419.9098

```
errd155 = immse(R, KmedianZd155);  
fprintf('MSE : %0.4f\n', errd155);
```

MSE : 420.8361

```
errd157 = immse(R, KmedianZd157);  
fprintf('MSE : %0.4f\n', errd157);
```

MSE : 423.2022

```
errd159 = immse(R, KmedianZd159);  
fprintf('MSE : %0.4f\n', errd159);
```

MSE : 427.2558

```
errd1511 = immse(R, KmedianZd1511);  
fprintf('MSE : %0.4f\n', errd1511);
```

MSE : 433.0745

```
errd1513 = immse(R, KmedianZd1513);  
fprintf('MSE : %0.4f\n', errd1513);
```

MSE : 440.6280

```
errd1515 = immse(R, KmedianZd1515);  
fprintf('MSE : %0.4f\n', errd1515);
```

MSE : 450.5687

・メディアンフィルタ(11\*11)を1回処理し,2回目,3回目に各メディアンフィルタを処理した時のそれぞれのMSEの比較

```
KmedianZe = medfilt2(I,[11 11],"symmetric");  
KmedianZe3 = medfilt2(KmedianZe,[3 3],"symmetric");  
KmedianZe5 = medfilt2(KmedianZe,[5 5],"symmetric");  
KmedianZe7 = medfilt2(KmedianZe,[7 7],"symmetric");  
KmedianZe9 = medfilt2(KmedianZe,[9 9],"symmetric");  
KmedianZe11 = medfilt2(KmedianZe,[11 11],"symmetric");  
KmedianZe13 = medfilt2(KmedianZe,[13 13],"symmetric");
```

```

KmedianZe15 = medfilt2(KmedianZe,[15 15],"symmetric");
KmedianZe33 = medfilt2(KmedianZe3,[3 3],"symmetric");
KmedianZe35 = medfilt2(KmedianZe3,[5 5],"symmetric");
KmedianZe37 = medfilt2(KmedianZe3,[7 7],"symmetric");
KmedianZe39 = medfilt2(KmedianZe3,[9 9],"symmetric");
KmedianZe311 = medfilt2(KmedianZe3,[11 11],"symmetric");
KmedianZe313 = medfilt2(KmedianZe3,[13 13],"symmetric");
KmedianZe315 = medfilt2(KmedianZe3,[15 15],"symmetric");
KmedianZe53 = medfilt2(KmedianZe5,[3 3],"symmetric");
KmedianZe55 = medfilt2(KmedianZe5,[5 5],"symmetric");
KmedianZe57 = medfilt2(KmedianZe5,[7 7],"symmetric");
KmedianZe59 = medfilt2(KmedianZe5,[9 9],"symmetric");
KmedianZe511 = medfilt2(KmedianZe5,[11 11],"symmetric");
KmedianZe513 = medfilt2(KmedianZe5,[13 13],"symmetric");
KmedianZe515 = medfilt2(KmedianZe5,[15 15],"symmetric");
KmedianZe73 = medfilt2(KmedianZe7,[3 3],"symmetric");
KmedianZe75 = medfilt2(KmedianZe7,[5 5],"symmetric");
KmedianZe77 = medfilt2(KmedianZe7,[7 7],"symmetric");
KmedianZe79 = medfilt2(KmedianZe7,[9 9],"symmetric");
KmedianZe711 = medfilt2(KmedianZe7,[11 11],"symmetric");
KmedianZe713 = medfilt2(KmedianZe7,[13 13],"symmetric");
KmedianZe715 = medfilt2(KmedianZe7,[15 15],"symmetric");
KmedianZe93 = medfilt2(KmedianZe9,[3 3],"symmetric");
KmedianZe95 = medfilt2(KmedianZe9,[5 5],"symmetric");
KmedianZe97 = medfilt2(KmedianZe9,[7 7],"symmetric");
KmedianZe99 = medfilt2(KmedianZe9,[9 9],"symmetric");
KmedianZe911 = medfilt2(KmedianZe9,[11 11],"symmetric");
KmedianZe913 = medfilt2(KmedianZe9,[13 13],"symmetric");
KmedianZe915 = medfilt2(KmedianZe9,[15 15],"symmetric");
KmedianZe113 = medfilt2(KmedianZe11,[3 3],"symmetric");
KmedianZe115 = medfilt2(KmedianZe11,[5 5],"symmetric");
KmedianZe117 = medfilt2(KmedianZe11,[7 7],"symmetric");
KmedianZe119 = medfilt2(KmedianZe11,[9 9],"symmetric");
KmedianZe1111 = medfilt2(KmedianZe11,[11 11],"symmetric");
KmedianZe1113 = medfilt2(KmedianZe11,[13 13],"symmetric");
KmedianZe1115 = medfilt2(KmedianZe11,[15 15],"symmetric");
KmedianZe133 = medfilt2(KmedianZe13,[3 3],"symmetric");
KmedianZe135 = medfilt2(KmedianZe13,[5 5],"symmetric");
KmedianZe137 = medfilt2(KmedianZe13,[7 7],"symmetric");
KmedianZe139 = medfilt2(KmedianZe13,[9 9],"symmetric");
KmedianZe1311 = medfilt2(KmedianZe13,[11 11],"symmetric");
KmedianZe1313 = medfilt2(KmedianZe13,[13 13],"symmetric");
KmedianZe1315 = medfilt2(KmedianZe13,[15 15],"symmetric");
KmedianZe153 = medfilt2(KmedianZe15,[3 3],"symmetric");
KmedianZe155 = medfilt2(KmedianZe15,[5 5],"symmetric");
KmedianZe157 = medfilt2(KmedianZe15,[7 7],"symmetric");
KmedianZe159 = medfilt2(KmedianZe15,[9 9],"symmetric");
KmedianZe1511 = medfilt2(KmedianZe15,[11 11],"symmetric");
KmedianZe1513 = medfilt2(KmedianZe15,[13 13],"symmetric");
KmedianZe1515 = medfilt2(KmedianZe15,[15 15],"symmetric");

erre3 = immse(R, KmedianZe3);
fprintf('MSE : %0.4f\n', erre3);

```

MSE : 422.9802

```
erre5 = immse(R, KmedianZe5);  
fprintf('MSE : %0.4f\n', erre5);
```

MSE : 406.4375

```
erre7 = immse(R, KmedianZe7);  
fprintf('MSE : %0.4f\n', erre7);
```

MSE : 397.0032

```
erre9 = immse(R, KmedianZe9);  
fprintf('MSE : %0.4f\n', erre9);
```

MSE : 392.7447

```
erre11 = immse(R, KmedianZe11);  
fprintf('MSE : %0.4f\n', erre11);
```

MSE : 397.7845

```
erre13 = immse(R, KmedianZe13);  
fprintf('MSE : %0.4f\n', erre13);
```

MSE : 409.6339

```
erre15 = immse(R, KmedianZe15);  
fprintf('MSE : %0.4f\n', erre15);
```

MSE : 425.6054

```
erre33 = immse(R, KmedianZe33);  
fprintf('MSE : %0.4f\n', erre33);
```

MSE : 416.8769

```
erre35 = immse(R, KmedianZe35);  
fprintf('MSE : %0.4f\n', erre35);
```

MSE : 403.9116

```
erre37 = immse(R, KmedianZe37);  
fprintf('MSE : %0.4f\n', erre37);
```

MSE : 397.2544

```
erre39 = immse(R, KmedianZe39);  
fprintf('MSE : %0.4f\n', erre39);
```

MSE : 394.1426

```
erre311 = immse(R, KmedianZe311);  
fprintf('MSE : %0.4f\n', erre311);
```

MSE : 399.0572

```
erre313 = immse(R, KmedianZe313);
```



```
fprintf('MSE : %0.4f\n', erre313);
```

MSE : 410.5545

```
erre315 = immse(R, KmedianZe315);  
fprintf('MSE : %0.4f\n', erre315);
```

MSE : 425.5770

```
erre53 = immse(R, KmedianZe53);  
fprintf('MSE : %0.4f\n', erre53);
```

MSE : 404.7013

```
erre55 = immse(R, KmedianZe55);  
fprintf('MSE : %0.4f\n', erre55);
```

MSE : 400.1985

```
erre57 = immse(R, KmedianZe57);  
fprintf('MSE : %0.4f\n', erre57);
```

MSE : 396.0204

```
erre59 = immse(R, KmedianZe59);  
fprintf('MSE : %0.4f\n', erre59);
```

MSE : 396.1796

```
erre511 = immse(R, KmedianZe511);  
fprintf('MSE : %0.4f\n', erre511);
```

MSE : 402.0681

```
erre513 = immse(R, KmedianZe513);  
fprintf('MSE : %0.4f\n', erre513);
```

MSE : 412.3383

```
erre515 = immse(R, KmedianZe515);  
fprintf('MSE : %0.4f\n', erre515);
```

MSE : 427.1287

```
erre73 = immse(R, KmedianZe73);  
fprintf('MSE : %0.4f\n', erre73);
```

MSE : 396.7148

```
erre75 = immse(R, KmedianZe75);  
fprintf('MSE : %0.4f\n', erre75);
```

MSE : 395.2875

```
erre77 = immse(R, KmedianZe77);  
fprintf('MSE : %0.4f\n', erre77);
```

MSE : 395.4746

```
erre79 = immse(R, KmedianZe79);  
fprintf('MSE : %0.4f\n', erre79);
```

MSE : 398.5988

```
erre711 = immse(R, KmedianZe711);  
fprintf('MSE : %0.4f\n', erre711);
```

MSE : 404.7864

```
erre713 = immse(R, KmedianZe713);  
fprintf('MSE : %0.4f\n', erre713);
```

MSE : 414.9570

```
erre715 = immse(R, KmedianZe715);  
fprintf('MSE : %0.4f\n', erre715);
```

MSE : 429.1378

```
erre93 = immse(R, KmedianZe93);  
fprintf('MSE : %0.4f\n', erre93);
```

MSE : 393.4012

```
erre95 = immse(R, KmedianZe95);  
fprintf('MSE : %0.4f\n', erre95);
```

MSE : 395.5769

```
erre97 = immse(R, KmedianZe97);  
fprintf('MSE : %0.4f\n', erre97);
```

MSE : 398.0406

```
erre99 = immse(R, KmedianZe99);  
fprintf('MSE : %0.4f\n', erre99);
```

MSE : 402.7035

```
erre911 = immse(R, KmedianZe911);  
fprintf('MSE : %0.4f\n', erre911);
```

MSE : 409.6269

```
erre913 = immse(R, KmedianZe913);  
fprintf('MSE : %0.4f\n', erre913);
```

MSE : 419.7319

```
erre915 = immse(R, KmedianZe915);  
fprintf('MSE : %0.4f\n', erre915);
```

MSE : 433.5101

```
erre113 = immse(R, KmedianZe113);  
fprintf('MSE : %0.4f\n', erre113);
```

MSE : 398.4182

```
erre115 = immse(R, KmedianZe115);  
fprintf('MSE : %0.4f\n', erre115);
```

MSE : 401.4197

```
erre117 = immse(R, KmedianZe117);  
fprintf('MSE : %0.4f\n', erre117);
```

MSE : 405.0331

```
erre119 = immse(R, KmedianZe119);  
fprintf('MSE : %0.4f\n', erre119);
```

MSE : 410.4356

```
erre1111 = immse(R, KmedianZe1111);  
fprintf('MSE : %0.4f\n', erre1111);
```

MSE : 417.4260

```
erre1113 = immse(R, KmedianZe1113);  
fprintf('MSE : %0.4f\n', erre1113);
```

MSE : 426.8480

```
erre1115 = immse(R, KmedianZe1115);  
fprintf('MSE : %0.4f\n', erre1115);
```

MSE : 439.4021

```
erre133 = immse(R, KmedianZe133);  
fprintf('MSE : %0.4f\n', erre133);
```

MSE : 410.0900

```
erre135 = immse(R, KmedianZe135);  
fprintf('MSE : %0.4f\n', erre135);
```

MSE : 412.4255

```
erre137 = immse(R, KmedianZe137);  
fprintf('MSE : %0.4f\n', erre137);
```

MSE : 416.1450

```
erre139 = immse(R, KmedianZe139);  
fprintf('MSE : %0.4f\n', erre139);
```

MSE : 420.8480

```
erre1311 = immse(R, KmedianZe1311);  
fprintf('MSE : %0.4f\n', erre1311);
```

MSE : 428.0797

```
erre1313 = immse(R, KmedianZe1313);
```

```
fprintf('MSE : %0.4f\n', erre1313);
```

MSE : 436.8030

```
erre1315 = immse(R, KmedianZe1315);  
fprintf('MSE : %0.4f\n', erre1315);
```

MSE : 447.8666

```
erre153 = immse(R, KmedianZe153);  
fprintf('MSE : %0.4f\n', erre153);
```

MSE : 425.8652

```
erre155 = immse(R, KmedianZe155);  
fprintf('MSE : %0.4f\n', erre155);
```

MSE : 427.5698

```
erre157 = immse(R, KmedianZe157);  
fprintf('MSE : %0.4f\n', erre157);
```

MSE : 430.7348

```
erre159 = immse(R, KmedianZe159);  
fprintf('MSE : %0.4f\n', erre159);
```

MSE : 435.0858

```
erre1511 = immse(R, KmedianZe1511);  
fprintf('MSE : %0.4f\n', erre1511);
```

MSE : 441.1367

```
erre1513 = immse(R, KmedianZe1513);  
fprintf('MSE : %0.4f\n', erre1513);
```

MSE : 448.9873

```
erre1515 = immse(R, KmedianZe1515);  
fprintf('MSE : %0.4f\n', erre1515);
```

MSE : 458.6157

- ・メディアンフィルタ(13\*13)を1回処理し, 2回目, 3回目に各メディアンフィルタを処理した時のそれぞれのMSEの比較

```
KmedianZf = medfilt2(I,[13 13],"symmetric");  
KmedianZf3 = medfilt2(KmedianZf,[3 3],"symmetric");  
KmedianZf5 = medfilt2(KmedianZf,[5 5],"symmetric");  
KmedianZf7 = medfilt2(KmedianZf,[7 7],"symmetric");  
KmedianZf9 = medfilt2(KmedianZf,[9 9],"symmetric");  
KmedianZf11 = medfilt2(KmedianZf,[11 11],"symmetric");  
KmedianZf13 = medfilt2(KmedianZf,[13 13],"symmetric");  
KmedianZf15 = medfilt2(KmedianZf,[15 15],"symmetric");  
KmedianZf33 = medfilt2(KmedianZf3,[3 3],"symmetric");  
KmedianZf35 = medfilt2(KmedianZf3,[5 5],"symmetric");
```

```

KmedianZf37 = medfilt2(KmedianZf3,[7 7],"symmetric");
KmedianZf39 = medfilt2(KmedianZf3,[9 9],"symmetric");
KmedianZf311 = medfilt2(KmedianZf3,[11 11],"symmetric");
KmedianZf313 = medfilt2(KmedianZf3,[13 13],"symmetric");
KmedianZf315 = medfilt2(KmedianZf3,[15 15],"symmetric");
KmedianZf53 = medfilt2(KmedianZf5,[3 3],"symmetric");
KmedianZf55 = medfilt2(KmedianZf5,[5 5],"symmetric");
KmedianZf57 = medfilt2(KmedianZf5,[7 7],"symmetric");
KmedianZf59 = medfilt2(KmedianZf5,[9 9],"symmetric");
KmedianZf511 = medfilt2(KmedianZf5,[11 11],"symmetric");
KmedianZf513 = medfilt2(KmedianZf5,[13 13],"symmetric");
KmedianZf515 = medfilt2(KmedianZf5,[15 15],"symmetric");
KmedianZf73 = medfilt2(KmedianZf7,[3 3],"symmetric");
KmedianZf75 = medfilt2(KmedianZf7,[5 5],"symmetric");
KmedianZf77 = medfilt2(KmedianZf7,[7 7],"symmetric");
KmedianZf79 = medfilt2(KmedianZf7,[9 9],"symmetric");
KmedianZf711 = medfilt2(KmedianZf7,[11 11],"symmetric");
KmedianZf713 = medfilt2(KmedianZf7,[13 13],"symmetric");
KmedianZf715 = medfilt2(KmedianZf7,[15 15],"symmetric");
KmedianZf93 = medfilt2(KmedianZf9,[3 3],"symmetric");
KmedianZf95 = medfilt2(KmedianZf9,[5 5],"symmetric");
KmedianZf97 = medfilt2(KmedianZf9,[7 7],"symmetric");
KmedianZf99 = medfilt2(KmedianZf9,[9 9],"symmetric");
KmedianZf911 = medfilt2(KmedianZf9,[11 11],"symmetric");
KmedianZf913 = medfilt2(KmedianZf9,[13 13],"symmetric");
KmedianZf915 = medfilt2(KmedianZf9,[15 15],"symmetric");
KmedianZf113 = medfilt2(KmedianZf11,[3 3],"symmetric");
KmedianZf115 = medfilt2(KmedianZf11,[5 5],"symmetric");
KmedianZf117 = medfilt2(KmedianZf11,[7 7],"symmetric");
KmedianZf119 = medfilt2(KmedianZf11,[9 9],"symmetric");
KmedianZf1111 = medfilt2(KmedianZf11,[11 11],"symmetric");
KmedianZf1113 = medfilt2(KmedianZf11,[13 13],"symmetric");
KmedianZf1115 = medfilt2(KmedianZf11,[15 15],"symmetric");
KmedianZf133 = medfilt2(KmedianZf13,[3 3],"symmetric");
KmedianZf135 = medfilt2(KmedianZf13,[5 5],"symmetric");
KmedianZf137 = medfilt2(KmedianZf13,[7 7],"symmetric");
KmedianZf139 = medfilt2(KmedianZf13,[9 9],"symmetric");
KmedianZf1311 = medfilt2(KmedianZf13,[11 11],"symmetric");
KmedianZf1313 = medfilt2(KmedianZf13,[13 13],"symmetric");
KmedianZf1315 = medfilt2(KmedianZf13,[15 15],"symmetric");
KmedianZf153 = medfilt2(KmedianZf15,[3 3],"symmetric");
KmedianZf155 = medfilt2(KmedianZf15,[5 5],"symmetric");
KmedianZf157 = medfilt2(KmedianZf15,[7 7],"symmetric");
KmedianZf159 = medfilt2(KmedianZf15,[9 9],"symmetric");
KmedianZf1511 = medfilt2(KmedianZf15,[11 11],"symmetric");
KmedianZf1513 = medfilt2(KmedianZf15,[13 13],"symmetric");
KmedianZf1515 = medfilt2(KmedianZf15,[15 15],"symmetric");

errf3 = immse(R, KmedianZf3);
fprintf('MSE : %0.4f\n', errf3);

```

MSE : 437.1682

```
errf5 = immse(R, KmedianZf5);
```

```
fprintf('MSE : %0.4f\n', errf5);
```

MSE : 427.9769

```
errf7 = immse(R, KmedianZf7);  
fprintf('MSE : %0.4f\n', errf7);
```

MSE : 420.9451

```
errf9 = immse(R, KmedianZf9);  
fprintf('MSE : %0.4f\n', errf9);
```

MSE : 418.4573

```
errf11 = immse(R, KmedianZf11);  
fprintf('MSE : %0.4f\n', errf11);
```

MSE : 420.5280

```
errf13 = immse(R, KmedianZf13);  
fprintf('MSE : %0.4f\n', errf13);
```

MSE : 426.7636

```
errf15 = immse(R, KmedianZf15);  
fprintf('MSE : %0.4f\n', errf15);
```

MSE : 437.6549

```
errf33 = immse(R, KmedianZf33);  
fprintf('MSE : %0.4f\n', errf33);
```

MSE : 434.2159

```
errf35 = immse(R, KmedianZf35);  
fprintf('MSE : %0.4f\n', errf35);
```

MSE : 426.4522

```
errf37 = immse(R, KmedianZf37);  
fprintf('MSE : %0.4f\n', errf37);
```

MSE : 420.9483

```
errf39 = immse(R, KmedianZf39);  
fprintf('MSE : %0.4f\n', errf39);
```

MSE : 419.2252

```
errf311 = immse(R, KmedianZf311);  
fprintf('MSE : %0.4f\n', errf311);
```

MSE : 421.7398

```
errf313 = immse(R, KmedianZf313);  
fprintf('MSE : %0.4f\n', errf313);
```

MSE : 428.0193

```
errf315 = immse(R, KmedianZf315);  
fprintf('MSE : %0.4f\n', errf315);
```

MSE : 438.7283

```
errf53 = immse(R, KmedianZf53);  
fprintf('MSE : %0.4f\n', errf53);
```

MSE : 426.9568

```
errf55 = immse(R, KmedianZf55);  
fprintf('MSE : %0.4f\n', errf55);
```

MSE : 423.3699

```
errf57 = immse(R, KmedianZf57);  
fprintf('MSE : %0.4f\n', errf57);
```

MSE : 420.6288

```
errf59 = immse(R, KmedianZf59);  
fprintf('MSE : %0.4f\n', errf59);
```

MSE : 420.0408

```
errf511 = immse(R, KmedianZf511);  
fprintf('MSE : %0.4f\n', errf511);
```

MSE : 423.2679

```
errf513 = immse(R, KmedianZf513);  
fprintf('MSE : %0.4f\n', errf513);
```

MSE : 430.1997

```
errf515 = immse(R, KmedianZf515);  
fprintf('MSE : %0.4f\n', errf515);
```

MSE : 440.4785

```
errf73 = immse(R, KmedianZf73);  
fprintf('MSE : %0.4f\n', errf73);
```

MSE : 420.8582

```
errf75 = immse(R, KmedianZf75);  
fprintf('MSE : %0.4f\n', errf75);
```

MSE : 420.1854

```
errf77 = immse(R, KmedianZf77);  
fprintf('MSE : %0.4f\n', errf77);
```

MSE : 420.1485

```
errf79 = immse(R, KmedianZf79);  
fprintf('MSE : %0.4f\n', errf79);
```



MSE : 421.9233

```
errf711 = immse(R, KmedianZf711);  
fprintf('MSE : %0.4f\n', errf711);
```

MSE : 425.8190

```
errf713 = immse(R, KmedianZf713);  
fprintf('MSE : %0.4f\n', errf713);
```

MSE : 432.8297

```
errf715 = immse(R, KmedianZf715);  
fprintf('MSE : %0.4f\n', errf715);
```

MSE : 443.0169

```
errf93 = immse(R, KmedianZf93);  
fprintf('MSE : %0.4f\n', errf93);
```

MSE : 418.7323

```
errf95 = immse(R, KmedianZf95);  
fprintf('MSE : %0.4f\n', errf95);
```

MSE : 420.0209

```
errf97 = immse(R, KmedianZf97);  
fprintf('MSE : %0.4f\n', errf97);
```

MSE : 421.7861

```
errf99 = immse(R, KmedianZf99);  
fprintf('MSE : %0.4f\n', errf99);
```

MSE : 424.6979

```
errf911 = immse(R, KmedianZf911);  
fprintf('MSE : %0.4f\n', errf911);
```

MSE : 429.5664

```
errf913 = immse(R, KmedianZf913);  
fprintf('MSE : %0.4f\n', errf913);
```

MSE : 436.9738

```
errf915 = immse(R, KmedianZf915);  
fprintf('MSE : %0.4f\n', errf915);
```

MSE : 447.3830

```
errf113 = immse(R, KmedianZf113);  
fprintf('MSE : %0.4f\n', errf113);
```

MSE : 420.9151

```
errf115 = immse(R, KmedianZf115);
```

```
fprintf('MSE : %0.4f\n', errf115);
```

MSE : 423.1779

```
errf117 = immse(R, KmedianZf117);  
fprintf('MSE : %0.4f\n', errf117);
```

MSE : 426.0113

```
errf119 = immse(R, KmedianZf119);  
fprintf('MSE : %0.4f\n', errf119);
```

MSE : 429.9436

```
errf1111 = immse(R, KmedianZf1111);  
fprintf('MSE : %0.4f\n', errf1111);
```

MSE : 435.5780

```
errf1113 = immse(R, KmedianZf1113);  
fprintf('MSE : %0.4f\n', errf1113);
```

MSE : 442.9848

```
errf1115 = immse(R, KmedianZf1115);  
fprintf('MSE : %0.4f\n', errf1115);
```

MSE : 453.2419

```
errf133 = immse(R, KmedianZf133);  
fprintf('MSE : %0.4f\n', errf133);
```

MSE : 427.3043

```
errf135 = immse(R, KmedianZf135);  
fprintf('MSE : %0.4f\n', errf135);
```

MSE : 429.7467

```
errf137 = immse(R, KmedianZf137);  
fprintf('MSE : %0.4f\n', errf137);
```

MSE : 433.2535

```
errf139 = immse(R, KmedianZf139);  
fprintf('MSE : %0.4f\n', errf139);
```

MSE : 437.5956

```
errf1311 = immse(R, KmedianZf1311);  
fprintf('MSE : %0.4f\n', errf1311);
```

MSE : 443.5591

```
errf1313 = immse(R, KmedianZf1313);  
fprintf('MSE : %0.4f\n', errf1313);
```

MSE : 451.2382

```
errf1315 = immse(R, KmedianZf1315);  
fprintf('MSE : %0.4f\n', errf1315);
```

MSE : 460.8252

```
errf153 = immse(R, KmedianZf153);  
fprintf('MSE : %0.4f\n', errf153);
```

MSE : 438.0841

```
errf155 = immse(R, KmedianZf155);  
fprintf('MSE : %0.4f\n', errf155);
```

MSE : 440.1667

```
errf157 = immse(R, KmedianZf157);  
fprintf('MSE : %0.4f\n', errf157);
```

MSE : 443.6095

```
errf159 = immse(R, KmedianZf159);  
fprintf('MSE : %0.4f\n', errf159);
```

MSE : 447.9875

```
errf1511 = immse(R, KmedianZf1511);  
fprintf('MSE : %0.4f\n', errf1511);
```

MSE : 453.9788

```
errf1513 = immse(R, KmedianZf1513);  
fprintf('MSE : %0.4f\n', errf1513);
```

MSE : 461.3004

```
errf1515 = immse(R, KmedianZf1515);  
fprintf('MSE : %0.4f\n', errf1515);
```

MSE : 470.3598

・メディアンフィルタ(15\*15)を1回処理し,2回目,3回目に各メディアンフィルタを処理した時のそれぞれのMSEの比較

```
KmedianZg = medfilt2(I,[15 15],"symmetric");  
KmedianZg3 = medfilt2(KmedianZg,[3 3],"symmetric");  
KmedianZg5 = medfilt2(KmedianZg,[5 5],"symmetric");  
KmedianZg7 = medfilt2(KmedianZg,[7 7],"symmetric");  
KmedianZg9 = medfilt2(KmedianZg,[9 9],"symmetric");  
KmedianZg11 = medfilt2(KmedianZg,[11 11],"symmetric");  
KmedianZg13 = medfilt2(KmedianZg,[13 13],"symmetric");  
KmedianZg15 = medfilt2(KmedianZg,[15 15],"symmetric");  
KmedianZg33 = medfilt2(KmedianZg3,[3 3],"symmetric");  
KmedianZg35 = medfilt2(KmedianZg3,[5 5],"symmetric");  
KmedianZg37 = medfilt2(KmedianZg3,[7 7],"symmetric");  
KmedianZg39 = medfilt2(KmedianZg3,[9 9],"symmetric");  
KmedianZg311 = medfilt2(KmedianZg3,[11 11],"symmetric");
```

```

KmedianZg313 = medfilt2(KmedianZg3,[13 13],"symmetric");
KmedianZg315 = medfilt2(KmedianZg3,[15 15],"symmetric");
KmedianZg53 = medfilt2(KmedianZg5,[3 3],"symmetric");
KmedianZg55 = medfilt2(KmedianZg5,[5 5],"symmetric");
KmedianZg57 = medfilt2(KmedianZg5,[7 7],"symmetric");
KmedianZg59 = medfilt2(KmedianZg5,[9 9],"symmetric");
KmedianZg511 = medfilt2(KmedianZg5,[11 11],"symmetric");
KmedianZg513 = medfilt2(KmedianZg5,[13 13],"symmetric");
KmedianZg515 = medfilt2(KmedianZg5,[15 15],"symmetric");
KmedianZg73 = medfilt2(KmedianZg7,[3 3],"symmetric");
KmedianZg75 = medfilt2(KmedianZg7,[5 5],"symmetric");
KmedianZg77 = medfilt2(KmedianZg7,[7 7],"symmetric");
KmedianZg79 = medfilt2(KmedianZg7,[9 9],"symmetric");
KmedianZg711 = medfilt2(KmedianZg7,[11 11],"symmetric");
KmedianZg713 = medfilt2(KmedianZg7,[13 13],"symmetric");
KmedianZg715 = medfilt2(KmedianZg7,[15 15],"symmetric");
KmedianZg93 = medfilt2(KmedianZg9,[3 3],"symmetric");
KmedianZg95 = medfilt2(KmedianZg9,[5 5],"symmetric");
KmedianZg97 = medfilt2(KmedianZg9,[7 7],"symmetric");
KmedianZg99 = medfilt2(KmedianZg9,[9 9],"symmetric");
KmedianZg911 = medfilt2(KmedianZg9,[11 11],"symmetric");
KmedianZg913 = medfilt2(KmedianZg9,[13 13],"symmetric");
KmedianZg915 = medfilt2(KmedianZg9,[15 15],"symmetric");
KmedianZg113 = medfilt2(KmedianZg11,[3 3],"symmetric");
KmedianZg115 = medfilt2(KmedianZg11,[5 5],"symmetric");
KmedianZg117 = medfilt2(KmedianZg11,[7 7],"symmetric");
KmedianZg119 = medfilt2(KmedianZg11,[9 9],"symmetric");
KmedianZg1111 = medfilt2(KmedianZg11,[11 11],"symmetric");
KmedianZg1113 = medfilt2(KmedianZg11,[13 13],"symmetric");
KmedianZg1115 = medfilt2(KmedianZg11,[15 15],"symmetric");
KmedianZg133 = medfilt2(KmedianZg13,[3 3],"symmetric");
KmedianZg135 = medfilt2(KmedianZg13,[5 5],"symmetric");
KmedianZg137 = medfilt2(KmedianZg13,[7 7],"symmetric");
KmedianZg139 = medfilt2(KmedianZg13,[9 9],"symmetric");
KmedianZg1311 = medfilt2(KmedianZg13,[11 11],"symmetric");
KmedianZg1313 = medfilt2(KmedianZg13,[13 13],"symmetric");
KmedianZg1315 = medfilt2(KmedianZg13,[15 15],"symmetric");
KmedianZg153 = medfilt2(KmedianZg15,[3 3],"symmetric");
KmedianZg155 = medfilt2(KmedianZg15,[5 5],"symmetric");
KmedianZg157 = medfilt2(KmedianZg15,[7 7],"symmetric");
KmedianZg159 = medfilt2(KmedianZg15,[9 9],"symmetric");
KmedianZg1511 = medfilt2(KmedianZg15,[11 11],"symmetric");
KmedianZg1513 = medfilt2(KmedianZg15,[13 13],"symmetric");
KmedianZg1515 = medfilt2(KmedianZg15,[15 15],"symmetric");

errg3 = immse(R, KmedianZg3);
fprintf('MSE : %.4f\n', errg3);

```

MSE : 455.6628

```

errg5 = immse(R, KmedianZg5);
fprintf('MSE : %.4f\n', errg5);

```

MSE : 449.7995

```
errg7 = immse(R, KmedianZg7);  
fprintf('MSE : %0.4f\n', errg7);
```

MSE : 445.7206

```
errg9 = immse(R, KmedianZg9);  
fprintf('MSE : %0.4f\n', errg9);
```

MSE : 443.0023

```
errg11 = immse(R, KmedianZg11);  
fprintf('MSE : %0.4f\n', errg11);
```

MSE : 443.2394

```
errg13 = immse(R, KmedianZg13);  
fprintf('MSE : %0.4f\n', errg13);
```

MSE : 446.8414

```
errg15 = immse(R, KmedianZg15);  
fprintf('MSE : %0.4f\n', errg15);
```

MSE : 454.1732

```
errg33 = immse(R, KmedianZg33);  
fprintf('MSE : %0.4f\n', errg33);
```

MSE : 453.8987

```
errg35 = immse(R, KmedianZg35);  
fprintf('MSE : %0.4f\n', errg35);
```

MSE : 449.0134

```
errg37 = immse(R, KmedianZg37);  
fprintf('MSE : %0.4f\n', errg37);
```

MSE : 445.3930

```
errg39 = immse(R, KmedianZg39);  
fprintf('MSE : %0.4f\n', errg39);
```

MSE : 443.4286

```
errg311 = immse(R, KmedianZg311);  
fprintf('MSE : %0.4f\n', errg311);
```

MSE : 444.1316

```
errg313 = immse(R, KmedianZg313);  
fprintf('MSE : %0.4f\n', errg313);
```

MSE : 447.6982

```
errg315 = immse(R, KmedianZg315);  
fprintf('MSE : %0.4f\n', errg315);
```

MSE : 455.2505

```
errg53 = immse(R, KmedianZg53);  
fprintf('MSE : %0.4f\n', errg53);
```

MSE : 449.2522

```
errg55 = immse(R, KmedianZg55);  
fprintf('MSE : %0.4f\n', errg55);
```

MSE : 447.0051

```
errg57 = immse(R, KmedianZg57);  
fprintf('MSE : %0.4f\n', errg57);
```

MSE : 444.7087

```
errg59 = immse(R, KmedianZg59);  
fprintf('MSE : %0.4f\n', errg59);
```

MSE : 443.8278

```
errg511 = immse(R, KmedianZg511);  
fprintf('MSE : %0.4f\n', errg511);
```

MSE : 445.2051

```
errg513 = immse(R, KmedianZg513);  
fprintf('MSE : %0.4f\n', errg513);
```

MSE : 449.5032

```
errg515 = immse(R, KmedianZg515);  
fprintf('MSE : %0.4f\n', errg515);
```

MSE : 457.2984

```
errg73 = immse(R, KmedianZg73);  
fprintf('MSE : %0.4f\n', errg73);
```

MSE : 445.5057

```
errg75 = immse(R, KmedianZg75);  
fprintf('MSE : %0.4f\n', errg75);
```

MSE : 444.9006

```
errg77 = immse(R, KmedianZg77);  
fprintf('MSE : %0.4f\n', errg77);
```

MSE : 444.5072

```
errg79 = immse(R, KmedianZg79);  
fprintf('MSE : %0.4f\n', errg79);
```

MSE : 444.7793

```
errg711 = immse(R, KmedianZg711);
```

```
fprintf('MSE : %0.4f\n', errg711);
```

MSE : 447.3312

```
errg713 = immse(R, KmedianZg713);  
fprintf('MSE : %0.4f\n', errg713);
```

MSE : 452.1490

```
errg715 = immse(R, KmedianZg715);  
fprintf('MSE : %0.4f\n', errg715);
```

MSE : 460.2225

```
errg93 = immse(R, KmedianZg93);  
fprintf('MSE : %0.4f\n', errg93);
```

MSE : 443.0824

```
errg95 = immse(R, KmedianZg95);  
fprintf('MSE : %0.4f\n', errg95);
```

MSE : 443.5986

```
errg97 = immse(R, KmedianZg97);  
fprintf('MSE : %0.4f\n', errg97);
```

MSE : 444.7460

```
errg99 = immse(R, KmedianZg99);  
fprintf('MSE : %0.4f\n', errg99);
```

MSE : 446.7335

```
errg911 = immse(R, KmedianZg911);  
fprintf('MSE : %0.4f\n', errg911);
```

MSE : 450.0170

```
errg913 = immse(R, KmedianZg913);  
fprintf('MSE : %0.4f\n', errg913);
```

MSE : 455.6802

```
errg915 = immse(R, KmedianZg915);  
fprintf('MSE : %0.4f\n', errg915);
```

MSE : 464.0146

```
errg113 = immse(R, KmedianZg113);  
fprintf('MSE : %0.4f\n', errg113);
```

MSE : 443.4906

```
errg115 = immse(R, KmedianZg115);  
fprintf('MSE : %0.4f\n', errg115);
```

MSE : 444.9884

```
errg117 = immse(R, KmedianZg117);  
fprintf('MSE : %0.4f\n', errg117);
```

MSE : 447.3094

```
errg119 = immse(R, KmedianZg119);  
fprintf('MSE : %0.4f\n', errg119);
```

MSE : 450.3617

```
errg1111 = immse(R, KmedianZg1111);  
fprintf('MSE : %0.4f\n', errg1111);
```

MSE : 454.6608

```
errg1113 = immse(R, KmedianZg1113);  
fprintf('MSE : %0.4f\n', errg1113);
```

MSE : 460.8382

```
errg1115 = immse(R, KmedianZg1115);  
fprintf('MSE : %0.4f\n', errg1115);
```

MSE : 469.4532

```
errg133 = immse(R, KmedianZg133);  
fprintf('MSE : %0.4f\n', errg133);
```

MSE : 447.2505

```
errg135 = immse(R, KmedianZg135);  
fprintf('MSE : %0.4f\n', errg135);
```

MSE : 449.1063

```
errg137 = immse(R, KmedianZg137);  
fprintf('MSE : %0.4f\n', errg137);
```

MSE : 452.4359

```
errg139 = immse(R, KmedianZg139);  
fprintf('MSE : %0.4f\n', errg139);
```

MSE : 456.1249

```
errg1311 = immse(R, KmedianZg1311);  
fprintf('MSE : %0.4f\n', errg1311);
```

MSE : 461.4549

```
errg1313 = immse(R, KmedianZg1313);  
fprintf('MSE : %0.4f\n', errg1313);
```

MSE : 468.0419

```
errg1315 = immse(R, KmedianZg1315);  
fprintf('MSE : %0.4f\n', errg1315);
```



MSE : 476.3450

```
errg153 = immse(R, KmedianZg153);  
fprintf('MSE : %0.4f\n', errg153);
```

MSE : 454.6186

```
errg155 = immse(R, KmedianZg155);  
fprintf('MSE : %0.4f\n', errg155);
```

MSE : 456.7163

```
errg157 = immse(R, KmedianZg157);  
fprintf('MSE : %0.4f\n', errg157);
```

MSE : 460.3903

```
errg159 = immse(R, KmedianZg159);  
fprintf('MSE : %0.4f\n', errg159);
```

MSE : 464.4411

```
errg1511 = immse(R, KmedianZg1511);  
fprintf('MSE : %0.4f\n', errg1511);
```

MSE : 469.7927

```
errg1513 = immse(R, KmedianZg1513);  
fprintf('MSE : %0.4f\n', errg1513);
```

MSE : 476.3059

```
errg1515 = immse(R, KmedianZg1515);  
fprintf('MSE : %0.4f\n', errg1515);
```

MSE : 484.5585