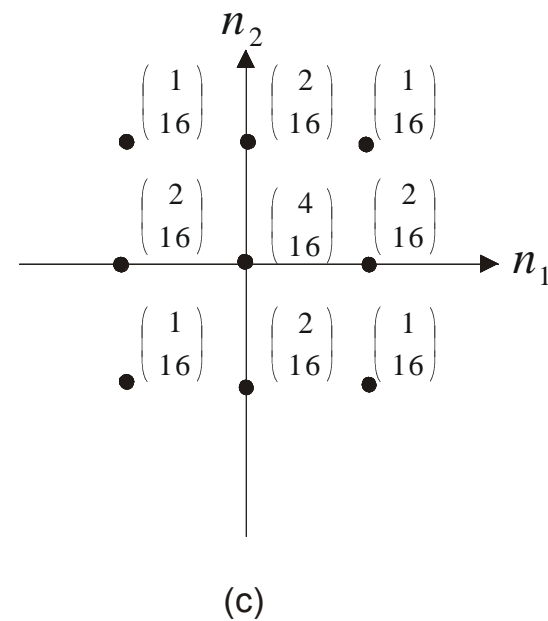
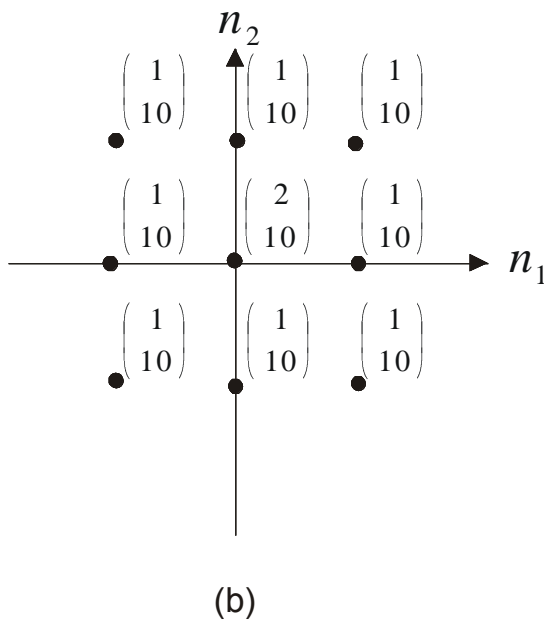
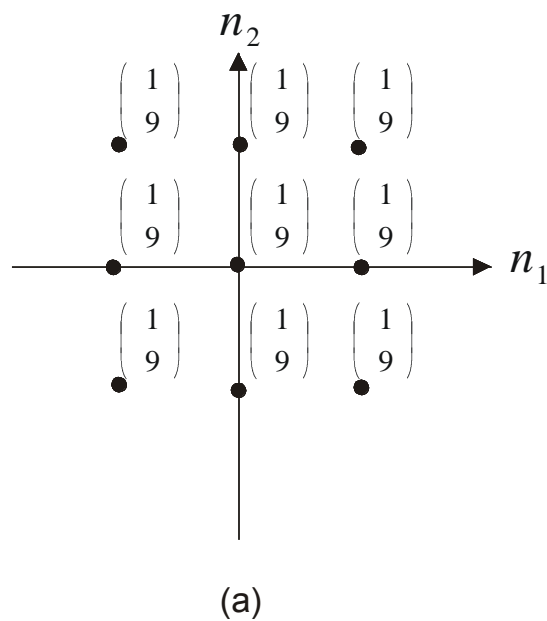


$$\frac{1}{9} \cdot \begin{array}{|c|c|c|} \hline 1 & 1 & 1 \\ \hline 1 & 1 & 1 \\ \hline 1 & 1 & 1 \\ \hline \end{array}$$

$$\frac{1}{10} \cdot \begin{array}{|c|c|c|} \hline 1 & 1 & 1 \\ \hline 1 & 2 & 1 \\ \hline 1 & 1 & 1 \\ \hline \end{array}$$

$$\frac{1}{16} \cdot \begin{array}{|c|c|c|} \hline 1 & 2 & 1 \\ \hline 2 & 4 & 2 \\ \hline 1 & 2 & 1 \\ \hline \end{array}$$


dolnopriepustná filtrácia



dolnopriepustná filtrácia

$$\frac{1}{273}$$

1	4	7	4	1
4	16	26	16	4
7	26	41	26	7
4	16	26	16	4
1	4	7	4	1

dolnopriepustná filtrácia - Gauussian

$$g(x, y) = \frac{1}{2\pi\sigma^2} e^{-\frac{x^2+y^2}{2\sigma^2}}$$

- 3x3

[1 2 1]
[2 4 2]
[1 2 1]

- 5x5

[1 1 2 1 1]
[1 2 4 2 1]
[2 4 8 4 2]
[1 2 4 2 1]
[1 1 2 1 1]

- 7x7

[1 1 2 2 2 1 1]
[1 2 2 4 2 2 1]
[2 2 4 8 4 2 2]
[2 4 8 16 8 4 2]
[2 2 4 8 4 2 2]
[1 2 2 4 2 2 1]
[1 1 2 2 2 1 1]

dolnopriepustná filtrácia - Gauussian



DP filter, Gaussov šum, Gaussovo jadro 3x3, 5x5



0.0, 0.2, 0.0
 0.2, 0.2, 0.2,
 0.0, 0.2, 0.0

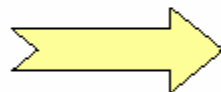
0, 0, 1, 0, 0,
 0, 1, 1, 1, 0,
 1, 1, 1, 1, 1, * 1/13
 0, 1, 1, 1, 0,
 0, 0, 1, 0, 0,



1, 0, 0, 0, 0, 0, 0, 0, 0,
 0, **1**, 0, 0, 0, 0, 0, 0, 0,
 0, 0, **1**, 0, 0, 0, 0, 0, 0,
 0, 0, 0, **1**, 0, 0, 0, 0, 0,
 0, 0, 0, 0, **1**, 0, 0, 0, 0,
 0, 0, 0, 0, 0, **1**, 0, 0, 0,
 0, 0, 0, 0, 0, 0, **1**, 0, 0,
 0, 0, 0, 0, 0, 0, 0, **1**, 0,
 0, 0, 0, 0, 0, 0, 0, 0, **1**,

*1/9

63	0	67
88	0	93
255	110	255



63	0	67
88	88	93
255	110	255

63	0	67	88	0	93	255	110	255
----	---	----	----	---	----	-----	-----	-----

0	0	63	67	88	93	110	255	255
---	---	----	----	----	----	-----	-----	-----

medianová filtrácia



medianová filtrácia



DP

- carrés (7x7)

```
[1 1 1 1 1 1 1]
[1 1 1 1 1 1 1]
[1 1 1 1 1 1 1]
[1 1 1 1 1 1 1]
[1 1 1 1 1 1 1]
[1 1 1 1 1 1 1]
[1 1 1 1 1 1 1]
```

- diamand (7x7)

```
[0 0 0 1 0 0 0]
[0 0 1 1 1 0 0]
[0 1 1 1 1 1 0]
[1 1 1 1 1 1 1]
[0 1 1 1 1 1 0]
[0 0 1 1 1 0 0]
[0 0 0 1 0 0 0]
```

- carrés (3x3)

```
[1 1 1]
[1 1 1]
[1 1 1]
```

- en croix (7x7)

```
[0 0 0 1 0 0 0]
[0 0 0 1 0 0 0]
[0 0 0 1 0 0 0]
[1 1 1 1 1 1 1]
[0 0 0 1 0 0 0]
[0 0 0 1 0 0 0]
[0 0 0 1 0 0 0]
```

- en croix (3x3)

```
[0 1 0]
[1 1 1]
[0 1 0]
```

medianová filtrácia



medianová filtrácia Gaussov šum



MEAN 3x3



MEDIAN 3x3



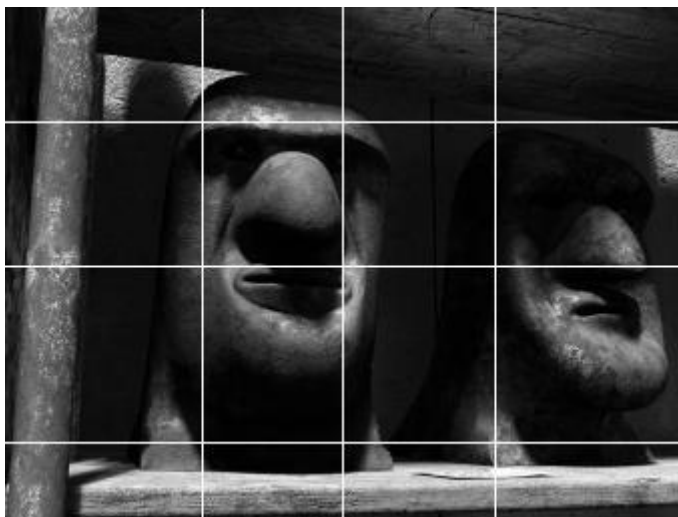
MEDIAN 5x5



MEDIAN 9x9



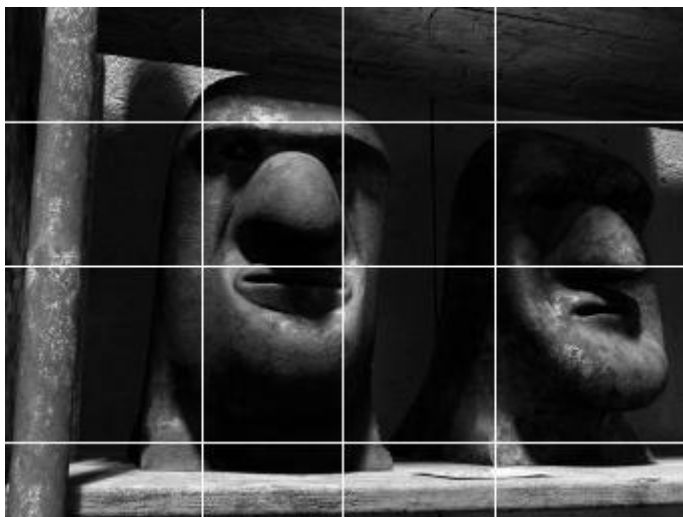
MEDIAN 15x15



ORIGINÁL



MED PO STĹPCOCH MED PO RIADKOCH



ORIGINÁL



2D MED 3x3

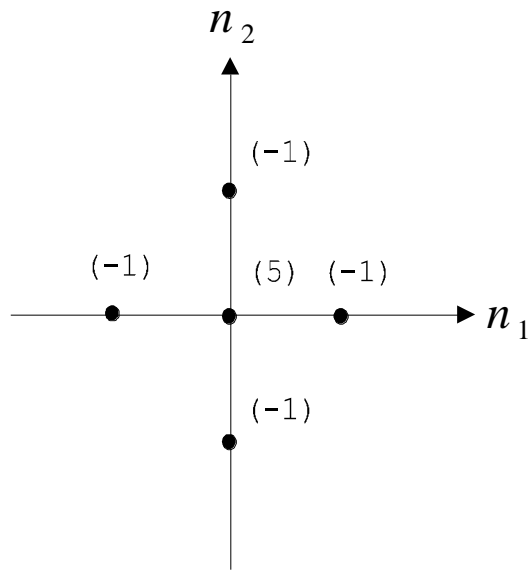


2D MED 5x5

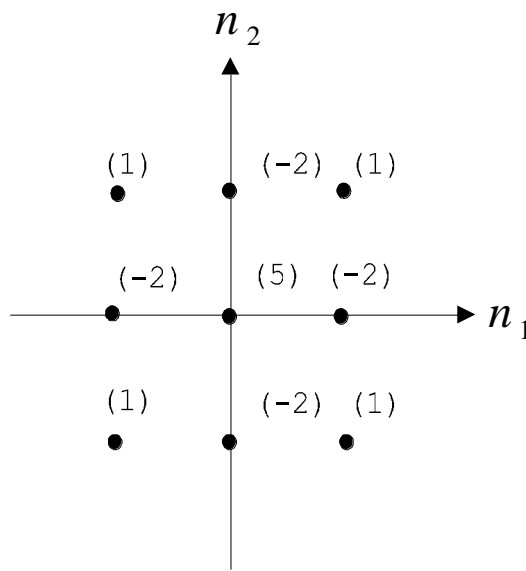
0	-1	0
-1	5	-1
0	-1	0

1	-2	1
-2	5	-2
1	-2	1

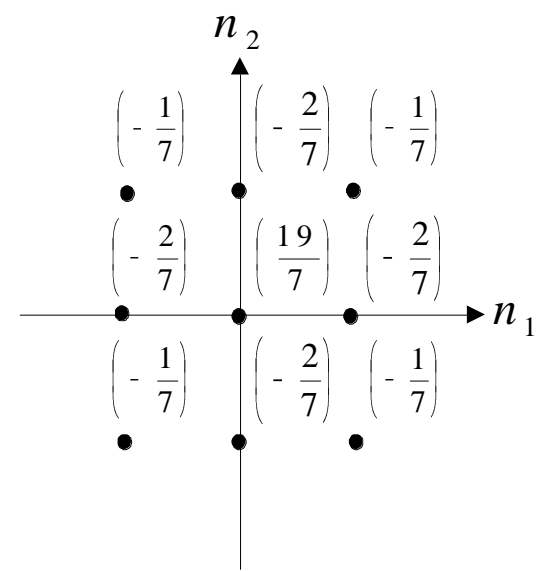
$$\frac{1}{7} \cdot \begin{array}{|c|c|c|} \hline -1 & -2 & -1 \\ \hline -2 & 19 & -2 \\ \hline -1 & -2 & -1 \\ \hline \end{array}$$



(a)

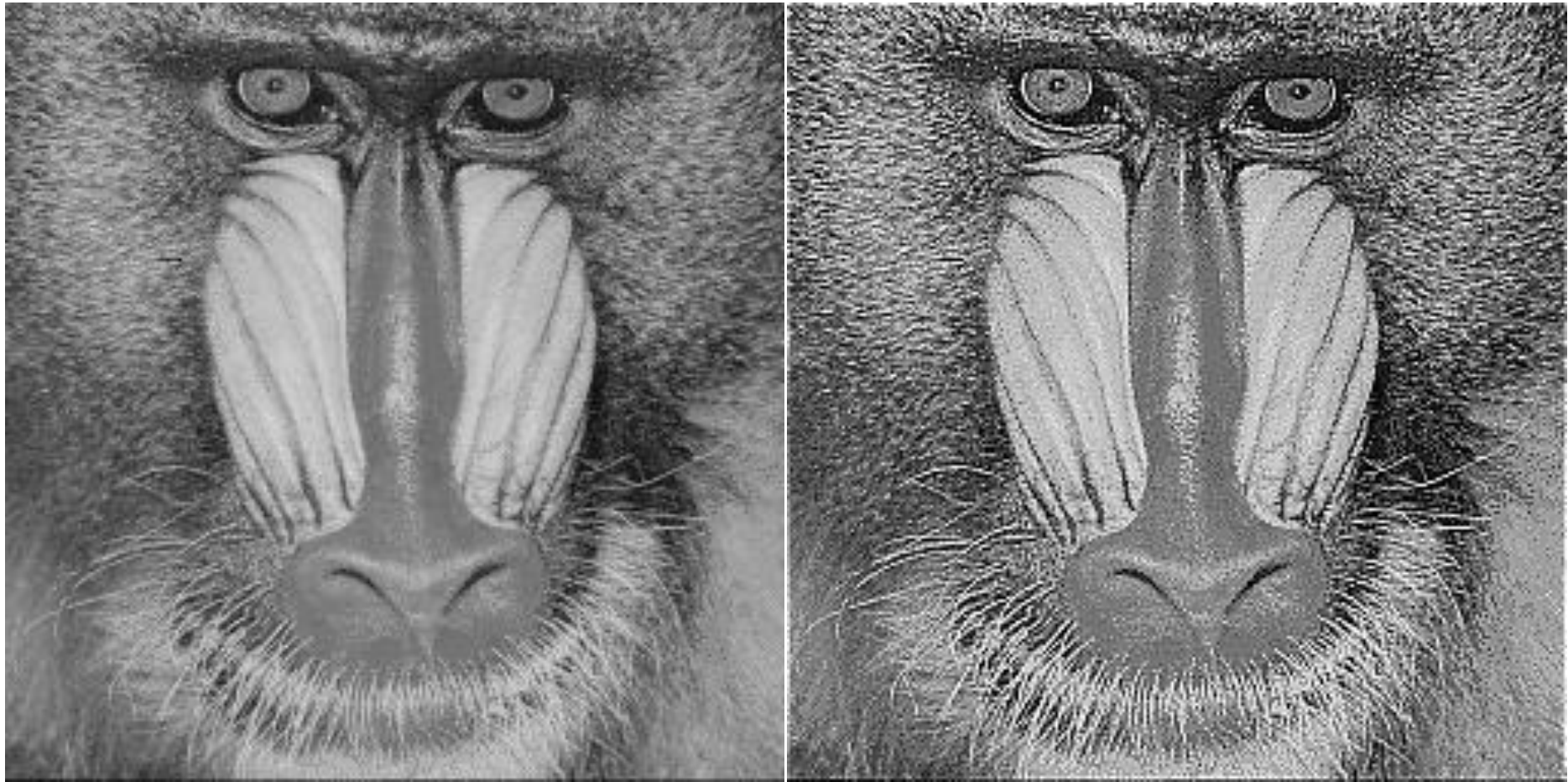


(b)



(c)

hornopriepustná filtrácia



hornopriepustná filtrácia



hornopriepustná filtrácia



-1, -1, -1,
-1, 9, -1,
-1, -1, -1

-1, -1, -1, -1, -1,
-1, 2, 2, 2, -1,
-1, 2, 8, 2, -1, *1/8
-1, 2, 2, 2, -1,
-1, -1, -1, -1, -1,



1, 1, 1,
1, -7, 1,
1, 1, 1