

Microsoft Word - Page Layout Formulas Review View Go to where you want to go																									
General Conditional Formatting Table Styles Insert Delete Format Cells Cells Editing																									
A1	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
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15	26	17	14	8	12	15	20	22	12	6	21	17	14	21	8	18	3	25	19	19					
16	18	2	4	25	23	21	25	9	1	6	21	14	6	22	1	18	5	23	19	1					
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19	19	25	21	11	18	15	12	24	13	21	13	9	16	8	14	19	19	21	21	23					
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**Xray Spex:
seeing the signal in
the noise**

Ingrid Aulike

Microsoft Word - Sample Data for the Microsoft Word Graphical Data Challenge																									
Graphical Data Challenge																									
Data for the Microsoft Word Graphical Data Challenge																									
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
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35																									

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General \$ % +0.00

Font Alignment Number

A1

A	B	C	D	E	F	G	H	I	J	K	
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5	4	12	7	9	10	10	4	16	4	7	1
6	23	11	11	14	17	17	14	5	7	15	12
7	26	5	18	26	11	6	25	17	9	20	12
8	22	26	12	23	4	6	2	21	14	18	16
9	24	22	6	2	12	23	26	14	26	14	15
10	5	19	15	13	5	1	20	7	20	25	5
11	16	19	3	14	11	7	9	7	4	20	3
12	2	11	4	9	18	23	5	14	19	18	22
13	24	26	21	11	13	20	15	20	26	21	7
14	26	17	14	8	12	15	20	22	12	6	21
15	18	2	4	25	23	21	25	9	1	6	21
16	10	15	23	20	13	9	2	2	7	5	26
17	11	20	5	21	7	5	15	11	13	9	14
18	19	25	21	11	18	15	12	24	13	21	13
19	5	2	19	7	9	20	17	4	1	10	19
20	22	15	12	11	13	24	24	9	7	5	19
21	18	15	5	1	22	9	24	22	26	15	15
22	26	2	5	3	24	18	3	11	16	9	11
23	7	8	6	25	19	14	10	12	15	3	16
24	25	13	2	4	2	21	15	21	16	19	25
25	16	22	17	3	14	22	10	7	9	22	23
26	16	23	17	3	20	5	13	19	16	13	13
27	1	24	7	15	8	21	17	24	22	25	21
28	9	22	6	13	19	4	10	5	6	16	6
29	30	5	12	2	22	8	22	11	7	26	4
31	1	25	10	5	17	6	25	19	7	3	4
32	23	6	18	26	22	8	17	16	1	15	8
33	1	6	23	6	9	10	8	8	14	1	21
34	7	23	5	19	25	3	10	2	23	21	21
35	9	15	13	23	7	23	16	25	21	23	23
36	18	21	5	4	1	4	6	23	23	14	9
37	25	7	23	20	9	22	23	17	15	3	8
38	14	26	5	16	19	23	25	3	26	7	24
39	19	3	23	25	18	23	17	26	24	11	22
40	16	3	1	20	13	23	3	18	12	2	21
41	10	1	10	24	26	13	23	12	8	26	22
42	6	8	4	26	7	6	23	7	23	2	26
43	6	20	6	18	18	14	23	21	14	21	2
44	26	8	21	4	11	17	23	22	19	3	16
45	10	8	21	6	10	11	23	5	21	10	4
46	9	18	24	13	7	13	23	18	25	9	17
47	1	16	26	13	23	3	23	8	9	12	14
48	21	22	12	7	26	22	23	14	23	15	3
49	21	5	16	11	10	14	10	23	11	17	22
50	15	8	2	12	10	6	7	23	15	25	7
51	22	24	5	26	20	26	11	23	25	18	12
52	23	4	20	18	11	14	23	16	13	25	10
53	8	23	9	4	20	9	5	23	21	4	9
54	5	15	10	25	24	21	5	23	15	21	14
55	3	26	18	13	4	25	21	23	15	21	14
56	25	13	5	17	24	24	18	23	19	20	15
57	4	17	2	23	24	21	10	23	14	23	15
58	12	6	3	5	17	7	22	2	12	0	11
59	13	9	2	5	17	7	22	2	12	0	11
60	12	6	3	5	17	7	22	2	12	0	11
61	13	9	2	5	17	7	22	2	12	0	11
62	12	6	3	5	17	7	22	2	12	0	11
63	13	9	2	5	17	7	22	2	12	0	11
64	12	6	3	5	17	7	22	2	12	0	11
65	13	9	2	5	17	7	22	2	12	0	11
66	12	6	3	5	17	7	22	2	12	0	11
67	13	9	2	5	17	7	22	2	12	0	11
68	12	6	3	5	17	7	22	2	12	0	11
69	13	9	2	5	17	7	22	2	12	0	11
70	12	6	3	5	17	7	22	2	12	0	11
71	13	9	2	5	17	7	22	2	12	0	11
72	12	6	3	5	17	7	22	2	12	0	11
73	13	9	2	5	17	7	22	2	12	0	11
74	12	6	3	5	17	7	22	2	12	0	11
75	13	9	2	5	17	7	22	2	12	0	11
76	12	6	3	5	17	7	22	2	12	0	11
77	13	9	2	5	17	7	22	2	12	0	11
78	12	6	3	5	17	7	22	2	12	0	11
79	13	9	2	5	17	7	22	2	12	0	11
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86	12	6	3	5	17	7	22	2	12	0	11
87	13	9	2	5	17	7	22	2	12	0	11
88	12	6	3	5	17	7	22	2	12	0	11
89	13	9	2	5	17	7	22	2	12	0	11
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92	12	6	3	5	17	7	22	2	12	0	11
93	13	9	2	5	17	7	22	2	12	0	11
94	12	6	3	5	17	7	22	2	12	0	11
95	13	9	2	5	17	7	22	2	12	0	11
96	12	6	3	5	17	7	22	2	12	0	11
97	13	9	2	5	17	7	22	2	12	0	11
98	12	6	3	5	17	7	22	2	12	0	11
99	13	9	2	5	17	7	22	2	12	0	11
100	12	6	3	5	17	7	22	2	12	0	11
101	13	9	2	5	17	7	22	2	12	0	11
102	12	6	3	5	17	7	22	2	12	0	11
103	13	9	2	5	17	7	22	2	12	0	11
104	12	6	3	5	17	7	22	2	12	0	11
105	13	9	2	5	17	7	22	2	12	0	11
106	12	6	3	5	17	7	22	2	12	0	11
107	13	9	2	5	17	7	22	2	12	0	11
108	12	6	3	5	17	7	22	2	12	0	11
109	13	9	2	5	17	7	22	2	12	0	11
110	12	6	3	5	17	7	22	2	12	0	11
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115	13	9	2	5	17	7	22	2	12	0	11
116	12	6	3	5	17	7	22	2	12	0	11
117	13	9	2	5	17	7	22	2	12	0	11
118	12	6	3	5	17	7	22	2	12	0	11
119	13	9	2	5	17	7	22	2	12	0	11
120	12	6	3	5	17	7	22	2	12	0	11
121	13	9	2	5	17	7	22	2	12	0	11
122	12	6	3	5	17	7	22	2	12	0	11
123	13	9	2	5	17	7	22	2	12	0	11
124	12	6	3	5	17	7	22	2	12	0	11
125	13	9	2	5	17	7	22	2	12	0	11
126	12	6	3	5	17	7	22	2	12	0	11
127	13	9	2	5	17	7	22	2	12	0	11
128	12	6	3	5	17	7	22	2	12	0	11
129	13	9	2	5	17	7	22	2	12	0	11
130	12	6	3	5	17	7	22	2	12	0	11
131	13	9	2	5	17	7	22	2	12	0	11
132	12	6	3	5	17	7	22	2	12	0	11
133	13	9	2	5	17	7					

```
data<-read.csv("WiBD_Canb_Data_Challenge_2018.csv")
```

```
summary(data)
```

```
##      A          B          C          D  
## Min. : 1.00    Min. : 1.00    Min. : 1.0    Min. : 1.00  
## 1st Qu.: 6.00   1st Qu.: 7.00   1st Qu.: 5.0   1st Qu.: 7.00  
## Median :12.00  Median :15.00  Median :12.0   Median :13.00  
## Mean   :12.95  Mean   :14.02  Mean   :12.7   Mean   :13.64  
## 3rd Qu.:20.25  3rd Qu.:21.00  3rd Qu.:20.0  3rd Qu.:20.25  
## Max.   :26.00  Max.   :26.00  Max.   :26.0   Max.   :26.00  
  
##  
##      E          F          G          H  
## Min. : 1.00    Min. : 1.00    Min. : 1.00   Min. : 1.0  
## 1st Qu.: 7.75   1st Qu.: 7.00   1st Qu.: 7.00   1st Qu.: 7.0  
## Median :14.00  Median :15.50  Median :12.00  Median :13.0  
## Mean   :13.94  Mean   :14.95  Mean   :12.73  Mean   :13.5  
## 3rd Qu.:20.00  3rd Qu.:22.00  3rd Qu.:18.00  3rd Qu.:21.0  
## Max.   :26.00  Max.   :26.00  Max.   :26.00  Max.   :26.0  
  
##  
##  
##  
##  
##  
##  
##  
##  
##  
##  
##
```

```
##  
##  
##  
##  
##  
##  
## DA DB DC DD  
## Min. : 1.00 Min. : 1.00 Min. : 1.0 Min. : 1.00  
## 1st Qu.: 7.00 1st Qu.: 7.00 1st Qu.: 7.0 1st Qu.: 4.00  
## Median :14.00 Median :13.00 Median :13.0 Median :10.00  
## Mean :12.94 Mean :13.44 Mean :13.2 Mean :11.55  
## 3rd Qu.:19.00 3rd Qu.:20.25 3rd Qu.:20.0 3rd Qu.:18.00  
## Max. :26.00 Max. :26.00 Max. :26.0 Max. :26.00  
##  
## DE DF DG  
## Min. : 1.00 Min. : 1.00 Min. : 1.00 G  
## 1st Qu.: 6.75 1st Qu.: 8.00 1st Qu.: 8.00 so  
## Median :14.00 Median :15.00 Median :13.00  
## Mean :13.77 Mean :14.27 Mean :13.44  
## 3rd Qu.:21.00 3rd Qu.:21.00 3rd Qu.:19.00  
## Max. :26.00 Max. :26.00 Max. :26.00  
##
```

*Goes up to DG ,
so 111 variables
(in the 111 columns)*

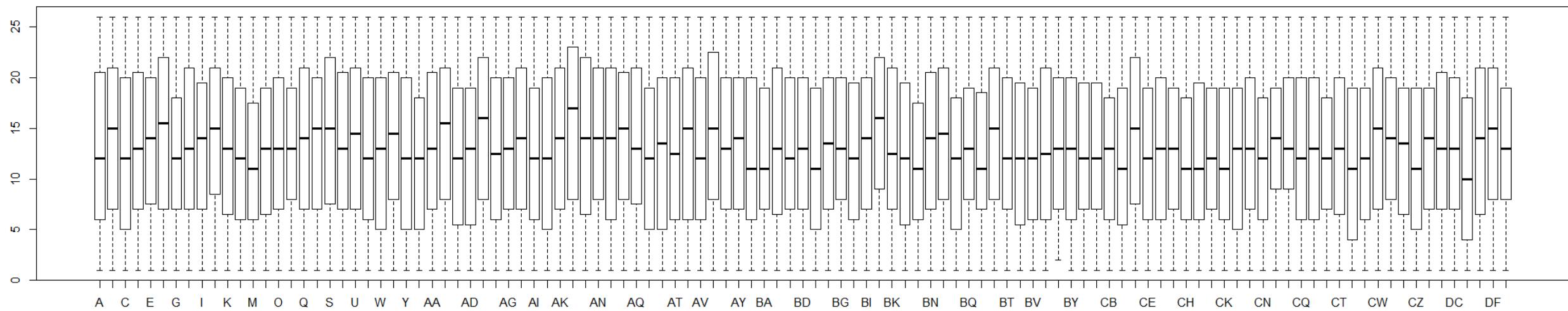
BX

Min. : 2.00
1st Qu.: 7.00
Median :13.00
Mean :13.37
3rd Qu.:20.00
Max. :26.00

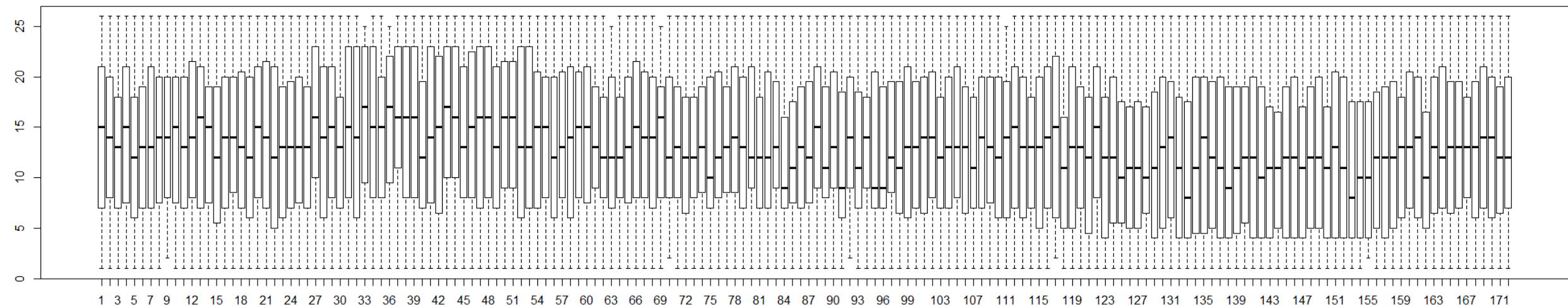
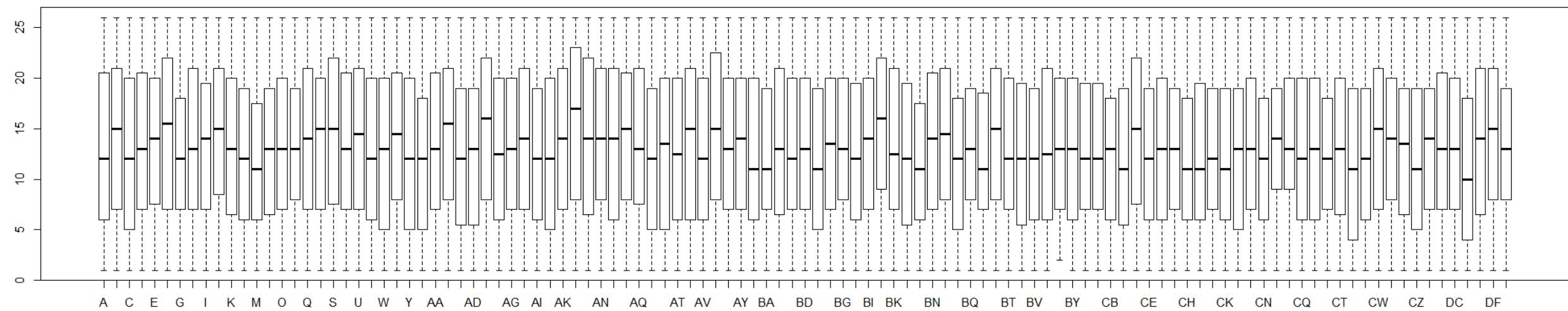
BK

Min. : 1.00
1st Qu.: 7.00
Median :12.50
Mean :13.46
3rd Qu.:21.00
Max. :26.00
NA's :2

A boxplot for each of the 111 variables (columns) $\mathcal{A}, \mathcal{B}, \mathcal{C}, \dots, \mathcal{D}\mathcal{F}, \mathcal{D}\mathcal{G}$



A boxplot for each of the 111 variables (columns) $\mathcal{A}, \mathcal{B}, \mathcal{C}, \dots, \mathcal{D}\mathcal{F}, \mathcal{D}\mathcal{G}$



and a boxplot for each of the 172 observations (rows) 1, 2, 3, ..., 172

172 datapoints per column \div 26 = average of 6.6 occurrences of "1" in any column

111 datapoints per row \div 26 = average of 4.3 occurrences of "1" in any row

172 datapoints per column \div 26 = average of 6.6 occurrences of “1” in any column

111 datapoints per row \div 26 = average of 4.3 occurrences of “1” in any row

So the probability of there being at least one “1” in any particular column is higher than the probability of there being at least one “1” in a row, if numbers are random - missing minimum value of “1” is nothing to worry about in the variables boxplots

$172 \text{ rows} \div 26 = \text{average of } 6.6 \text{ occurrences of "1", and of "2" etc in any column}$

$711 \text{ columns} \div 26 = \text{average of } 4.3 \text{ occurrences of "1", etc in any row}$

So the probability of there being at least one "1" in any particular column is higher than the probability of there being at least one "1" in a row, if numbers are random - missing minimum value of "1" is nothing to worry about in the variables boxplots

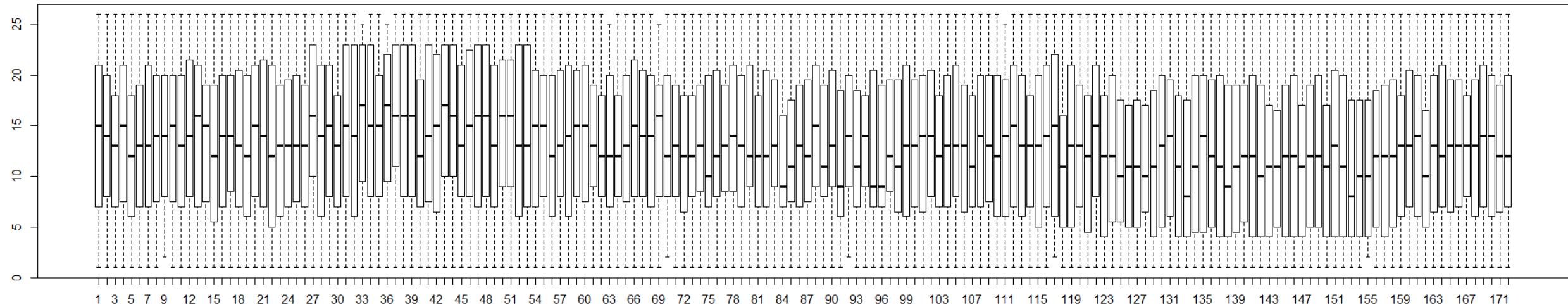
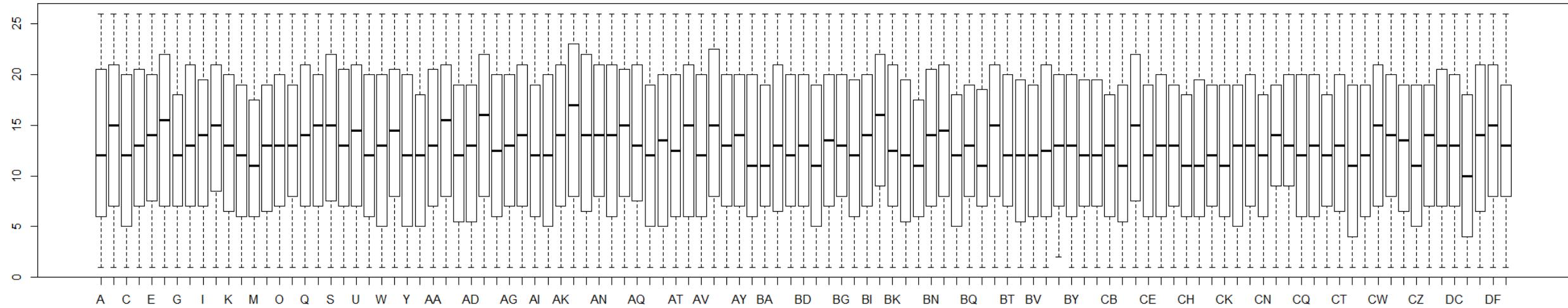
$2 \times 2 \times \text{a prime number}$

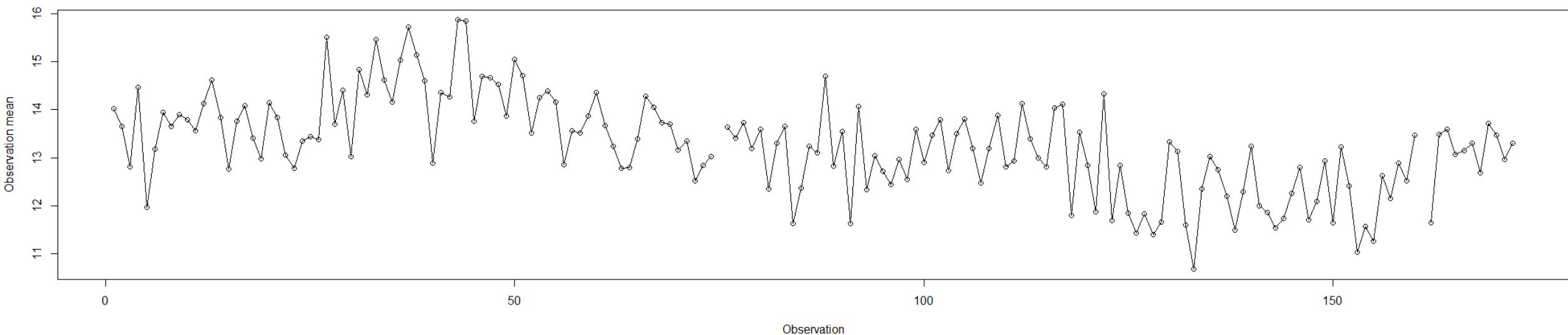
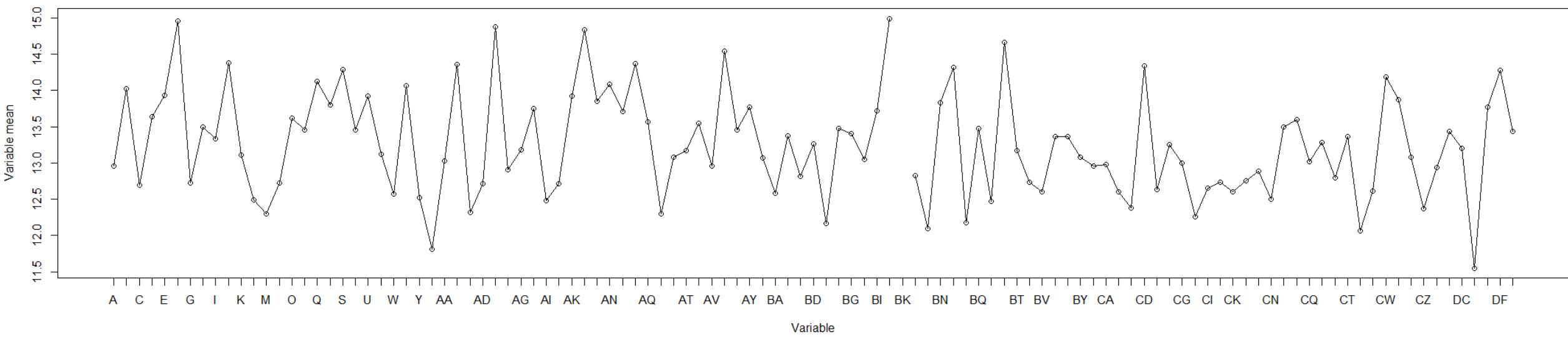
$2 \times \text{a prime number}$

172 rows \div 26 = average of 6.6 occurrences of "7" in any row

711 columns \div 26 = average of 4.3 occurrences of "7" in any column

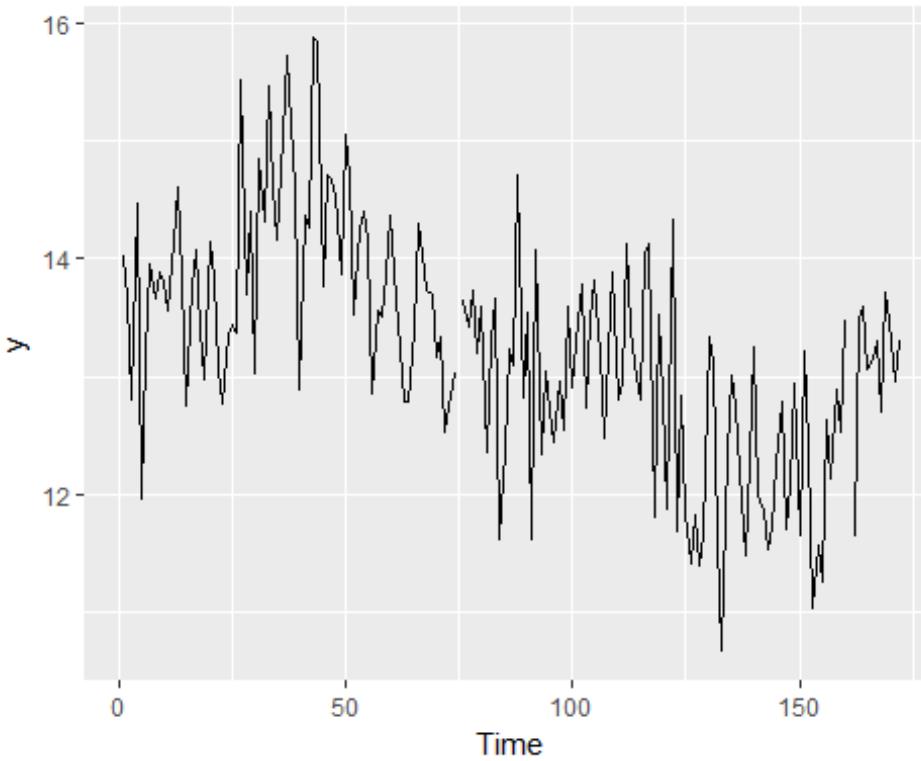
$3 \times \text{a prime number}$





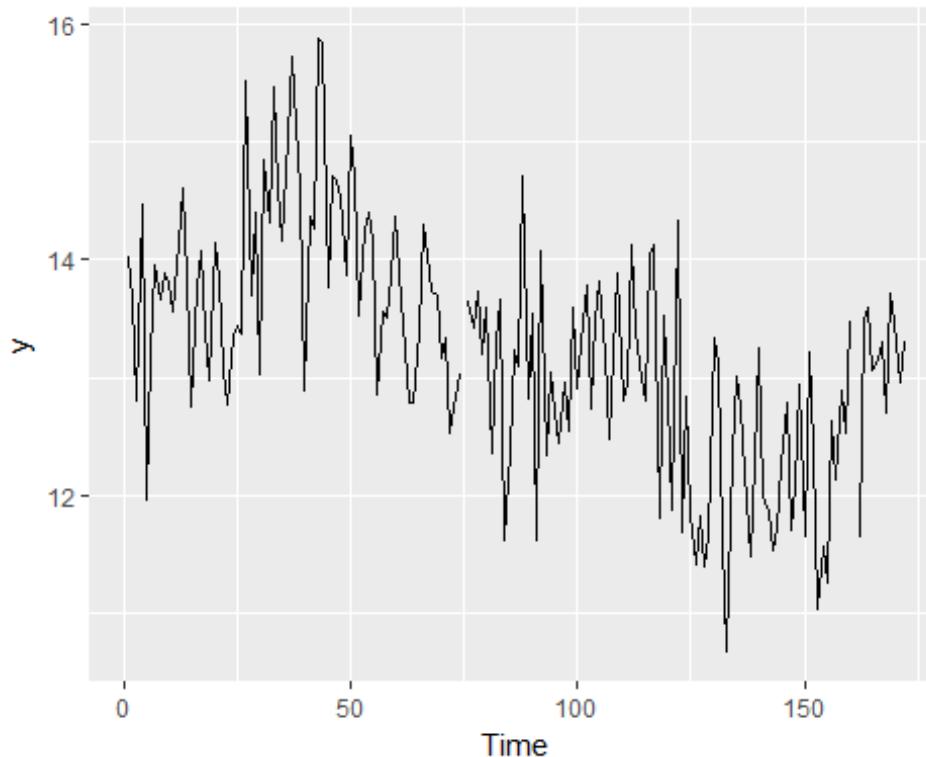
```
y <- ts(rowMeans(as.matrix(data)))  
autoplot(y)
```

```
auto.arima( y)  
## Series: y  
## ARIMA(0,1,1)  
##  
## Coefficients:  
##             ma1  
##             -0.8063  
## s.e.      0.0415  
##  
## sigma^2 estimated as 0.5654: log likelihood=-192.74  
## AIC=389.47   AICc=389.54   BIC=395.76
```



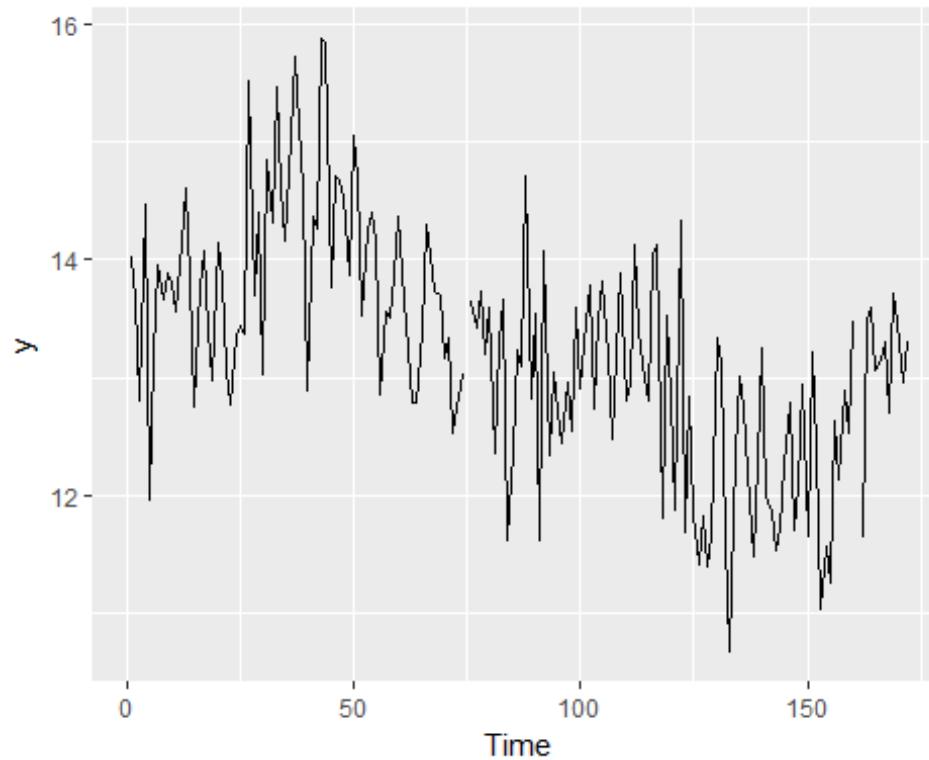
```
y <- ts(rowMeans(as.matrix(data)))  
autoplot(y)
```

```
auto.arima( y )  
## Series: y  
## ARIMA(0,1,1)  
##  
## Coefficients:  
##             ma1  
##             -0.8063  
## s.e.      0.0415  
##  
## sigma^2 estimated as 0.5654: log likelihood=-192.74  
## AIC=389.47   AICc=389.54   BIC=395.76
```

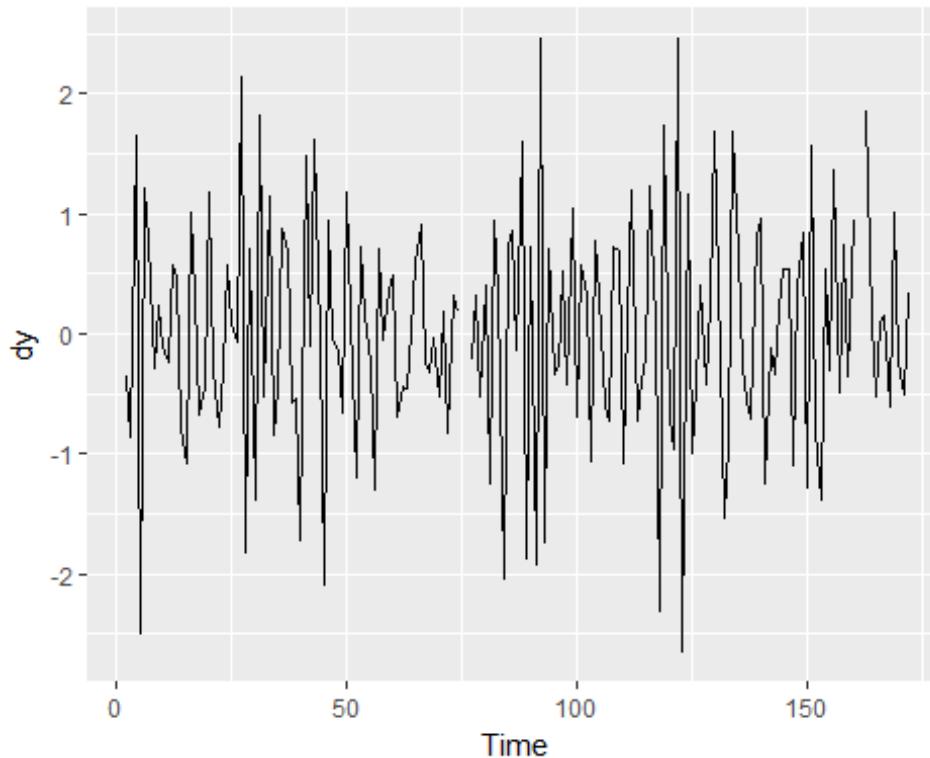


```
y <- ts(rowMeans(as.matrix(data)))  
autoplot(y)
```

```
auto.arima( y)  
## Series: y  
## ARIMA(0,1,1)  
##  
## Coefficients:  
##                 ma1  
##                 -0.8063  
## s.e.          0.0415  
##  
## sigma^2 estimated as 0.5654: log likelihood=-192.74  
## AIC=389.47    AICc=389.54    BIC=395.76
```

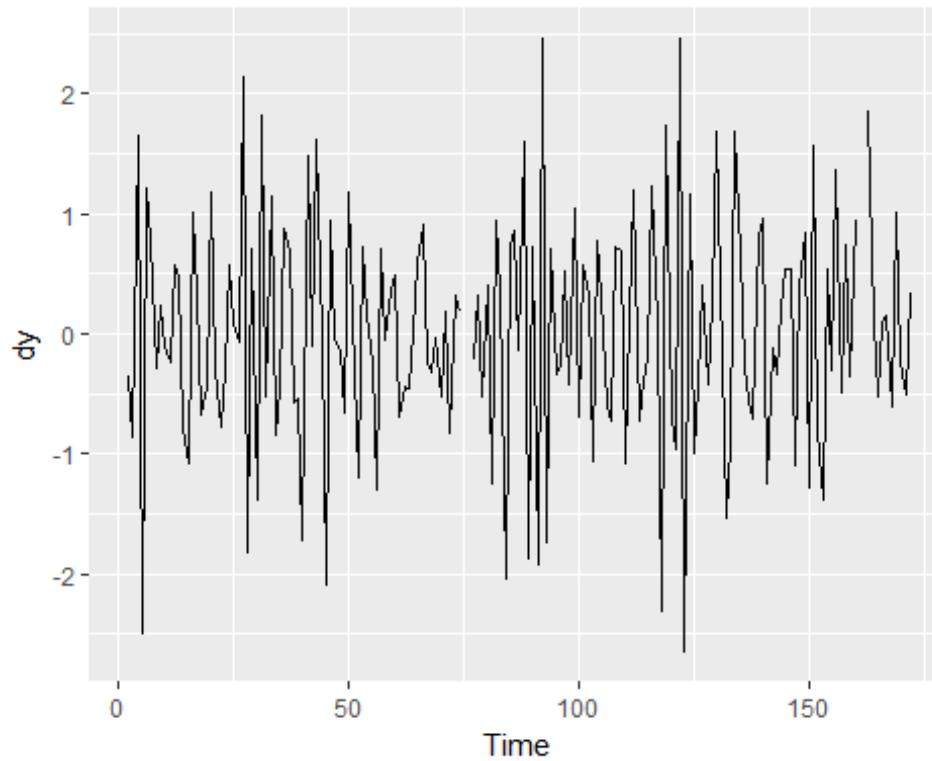


```
dy=diff(y)  
autoplot(dy)
```



```
auto.arima(dy)  
## Series: dy  
## ARIMA(0,0,1) with zero mean  
##  
## Coefficients:  
##                 ma1  
##                 -0.8128  
## s.e.          0.0451  
##  
## sigma^2 estimated as 0.5613: log likelihood=-191.84  
## AIC=387.68    AICc=387.75    BIC=393.96
```

```
dy=diff(y)  
autoplot(dy)
```

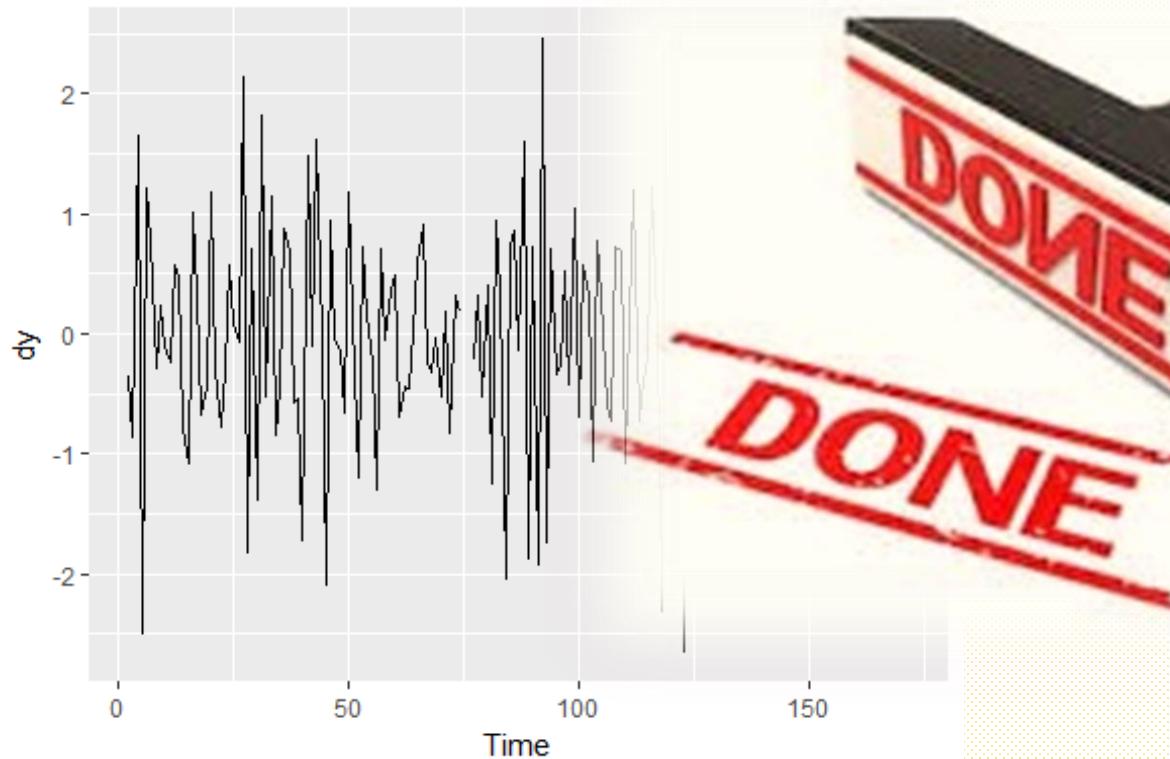


```
auto.arima(dy)  
## Series: dy  
## ARIMA(0,0,1) with zero mean  
##  
## Coefficients:  
##             ma1  
##             -0.8128  
## s.e.      0.0451  
##  
## sigma^2 estimated as 0.5613: log likelihood=-191.84  
## AIC=387.68    AICc=387.75    BIC=393.96
```

- * No longer needs differencing
- * Differences of observation means are a moving average series of order 1

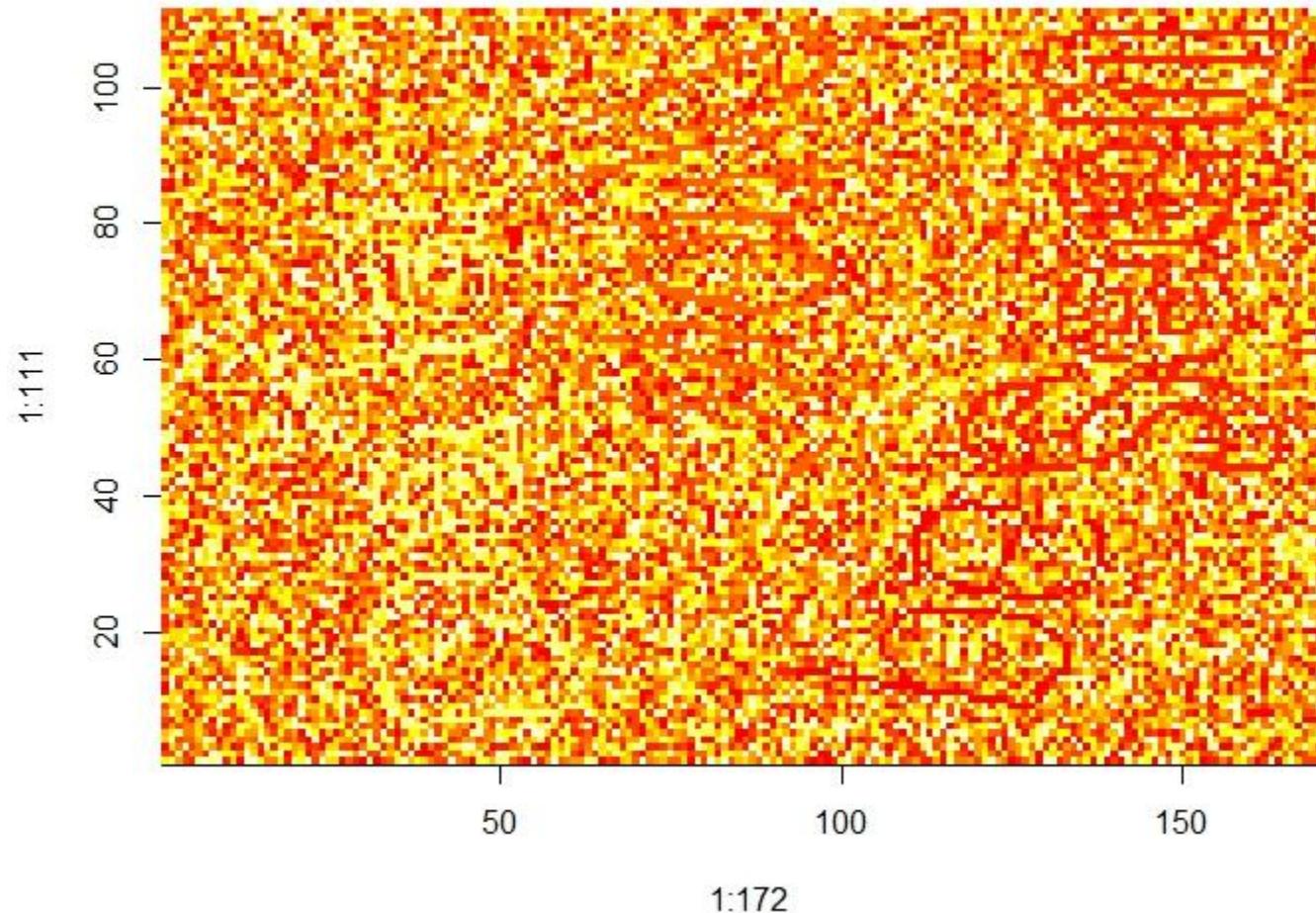
```
dy=diff(y)  
autoplot(dy)
```

```
auto.arima(dy)  
## Series: dy  
## ARIMA(0,0,1) with zero mean  
##  
## Coefficients:  
##             ma1  
##             -0.8128  
## s.e.      0.0451  
##  
## sigma^2 estimated as 0.5613: log likelihood=-191.84  
## AIC=387.68    AICc=387.75    BIC=393.96
```

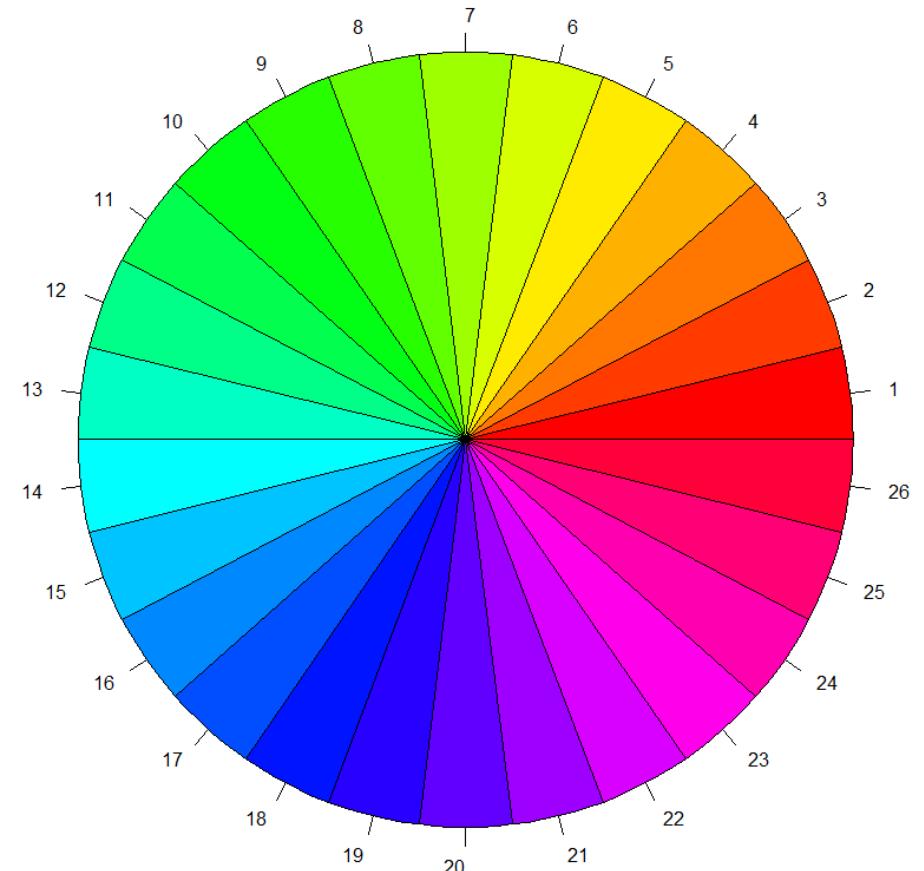
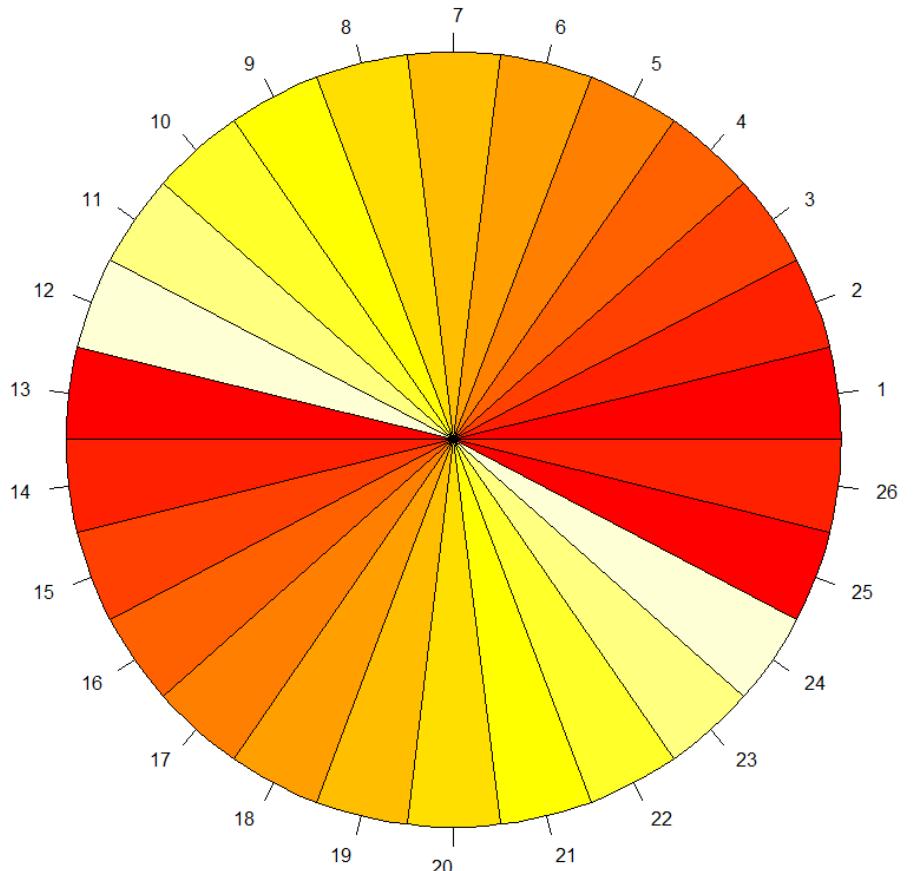


- * No longer needs differencing
- * Differences of observation means are a moving average series of order 1

```
image(1:172, 1:111, as.matrix(data))
```

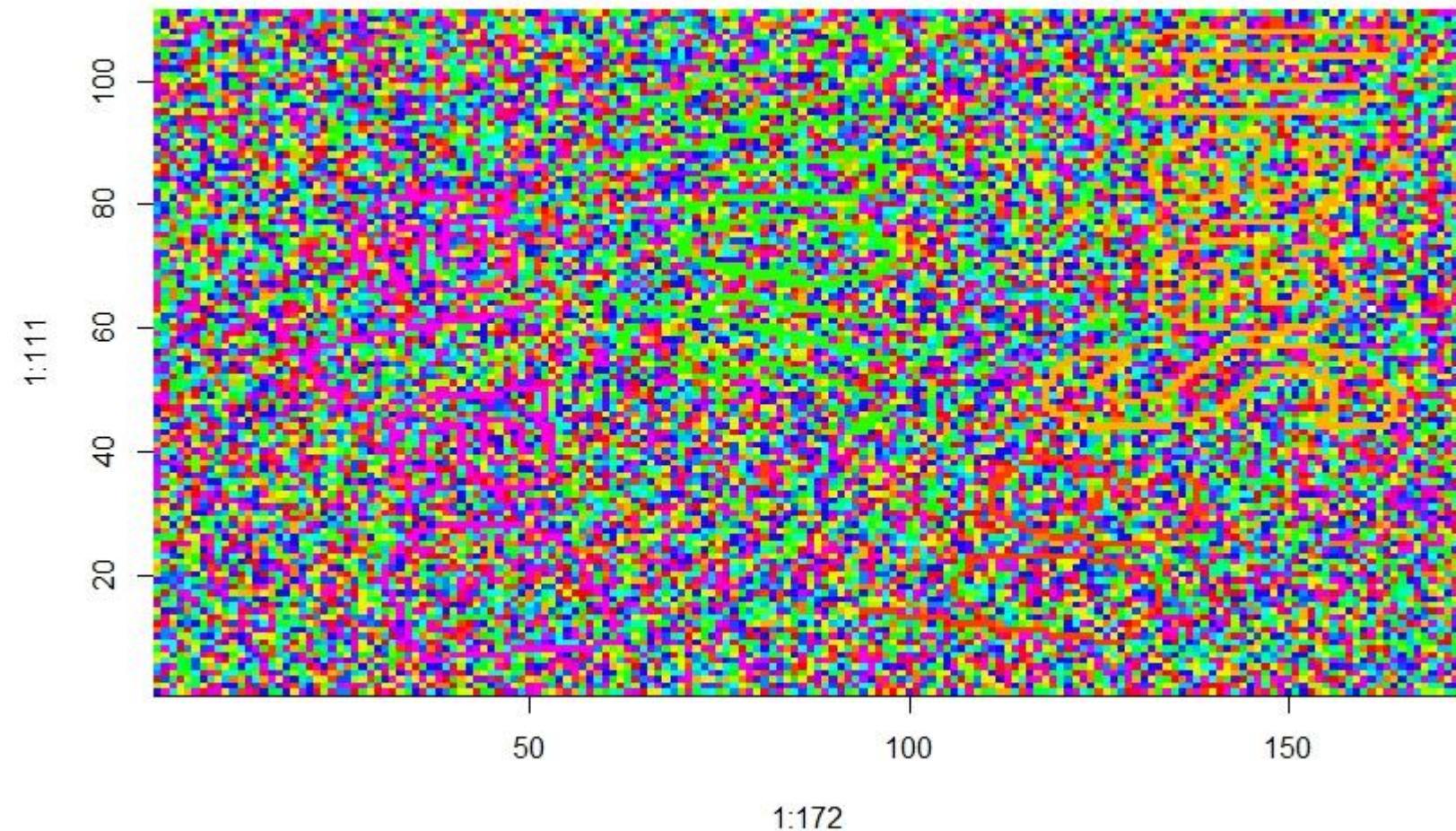


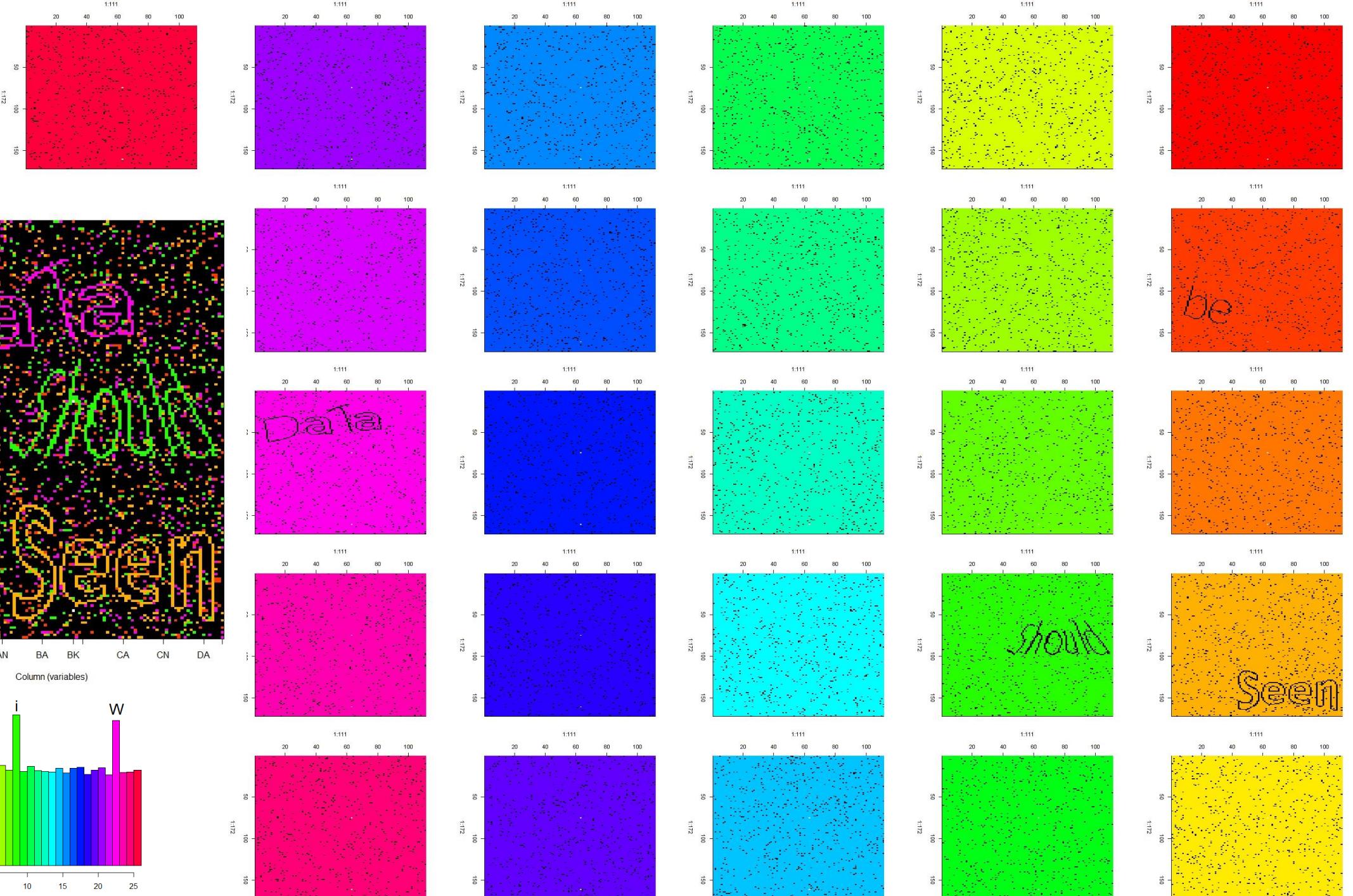
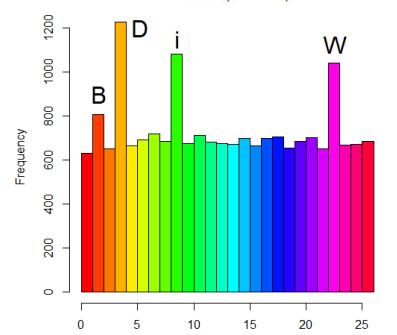
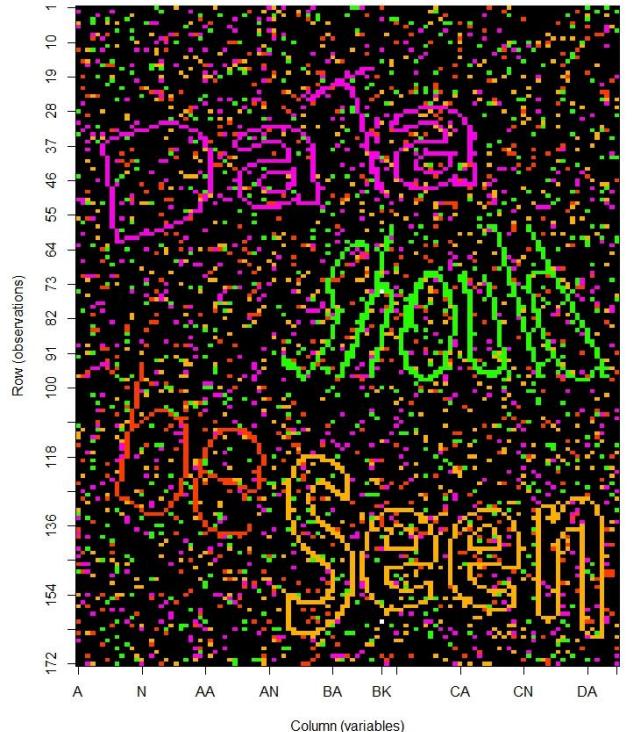
Default heat.colors(12) applied to numbers 1 to 26

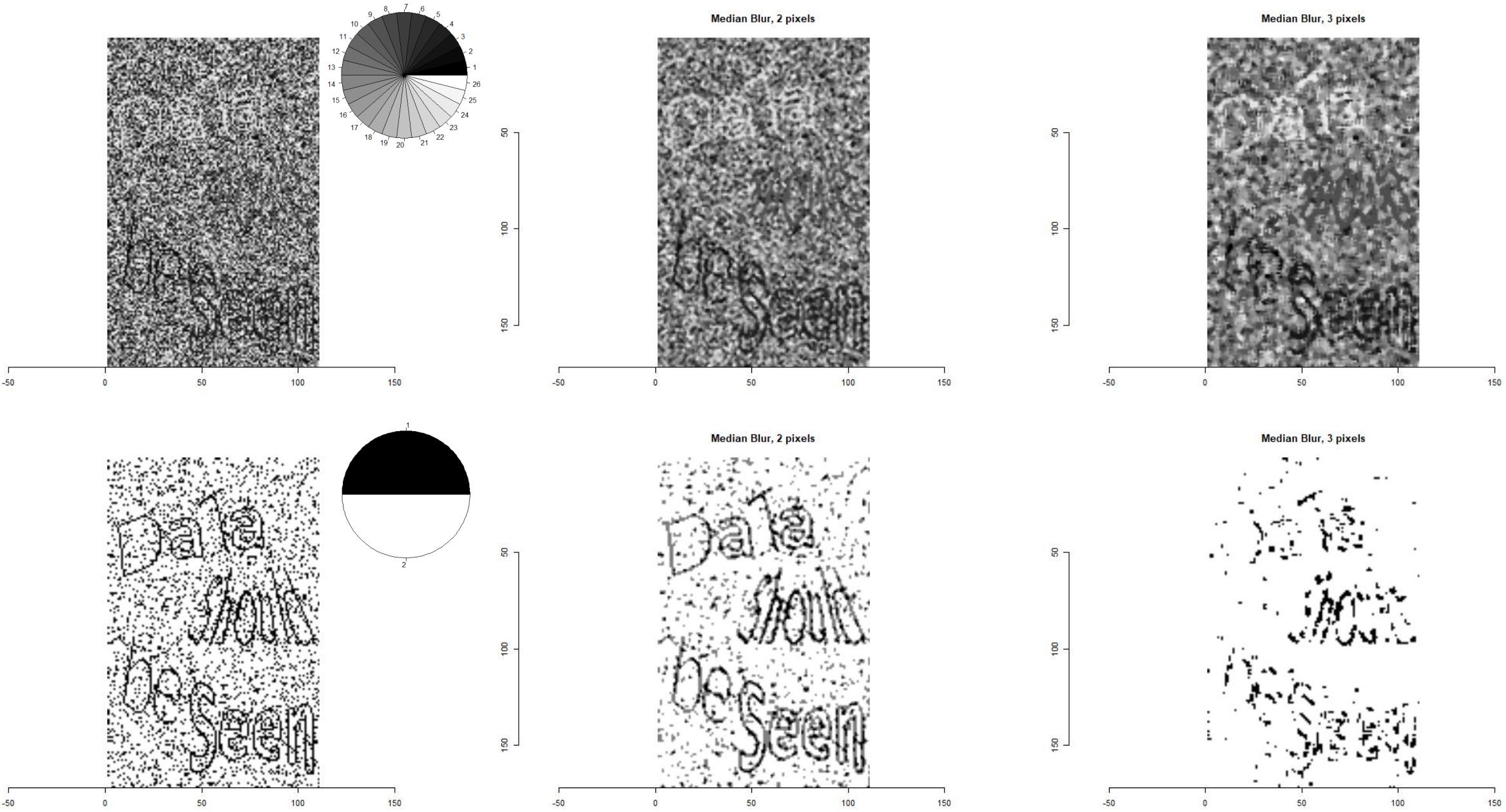


rainbow(26) palette might work better

```
image(1:172, 1:111, as.matrix(data), col=rainbow(26) )
```



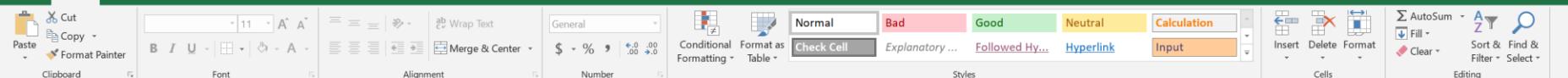




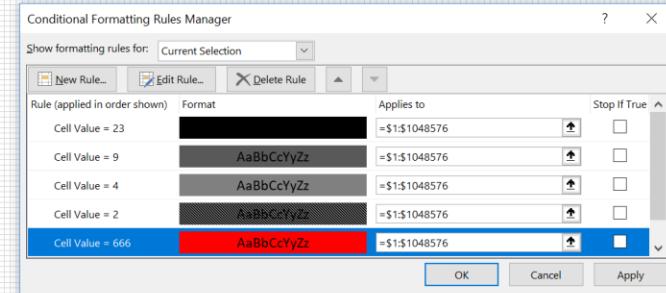
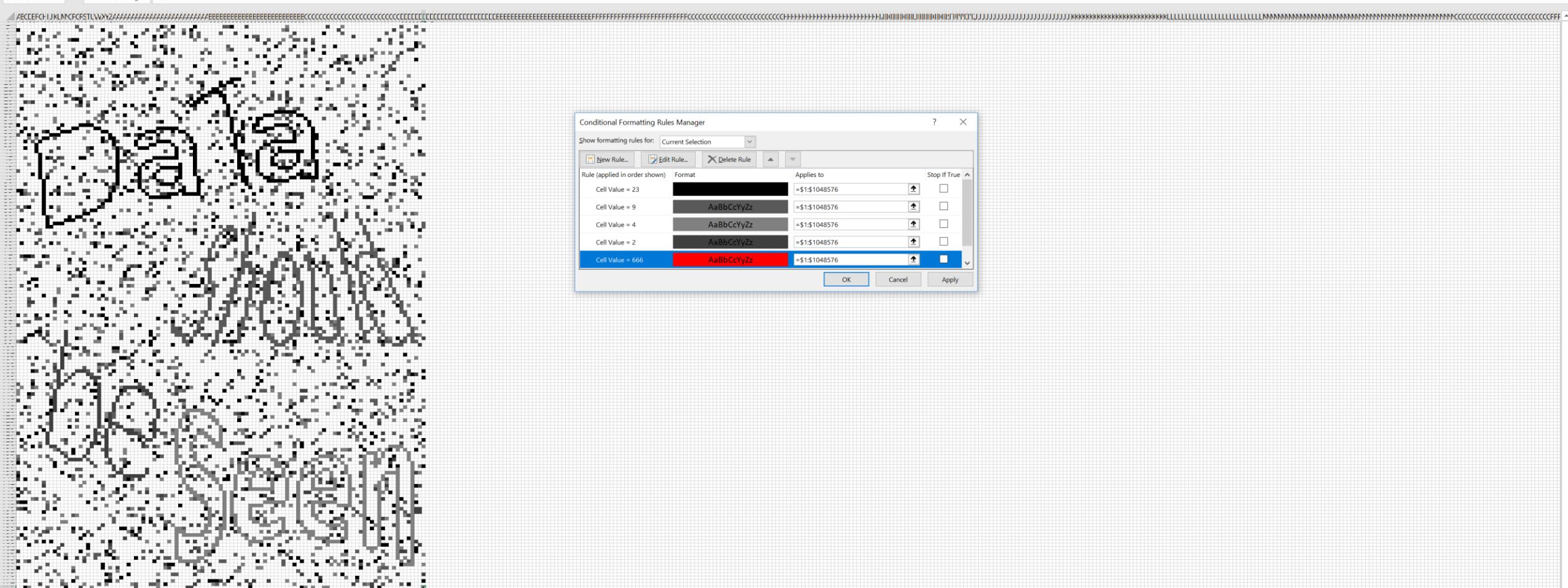
A screenshot of a Microsoft Excel spreadsheet titled "DG173". The main area shows a large grid of data, with the first few columns containing labels like "Page", "Date", and "Time". A specific cell in the "Page" column is selected and highlighted with a red border. To the right of the grid, a "Conditional Formatting Rules Manager" dialog box is open. It lists four rules applied to the range \$1:\$1048576. The rules are: "Cell Value = 23" with format "AaBbCcYyZz"; "Cell Value = 9" with format "AaBbCcYyZz"; "Cell Value = 4" with format "AaBbCcYyZz"; and "Cell Value = 2" with format "AaBbCcYyZz". Each rule has a "Stop If True" checkbox checked. The dialog box includes buttons for "OK", "Close", and "Apply".

The screenshot shows the 'Conditional Formatting Rules Manager' dialog box. The 'Show formatting rules for:' dropdown is set to 'Current Selection'. The 'Format' column contains four different styles: a black background with white text, a grey background with dark grey text, a dark grey background with light grey text, and a dark grey background with diagonal grey stripes. The 'Applies to' column shows the formula for each rule: =A1:\$A\$1048576, =\$1:\$1048576, =\$1:\$1048576, and =\$1:\$1048576 respectively. The 'Stop if True' column contains four empty checkboxes. At the bottom, there are 'OK', 'Close', and 'Apply' buttons.

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DG173 ✓ fx 23



A cross-stitch pattern on a light-colored grid background. The pattern includes a central floral design with a bee. The word "Said" is stitched in black in the upper left area. In the center, the words "and" and "not" are stitched in red. In the lower right area, the word "Heard" is stitched in red above a smaller floral motif.

