

Can this Data be normally distributed ?

Correct question: Has the data been sampled from a distribution that is close to the normal (Gaussian) bell curve?

Methods to test for normality:

- Graphical: Frequency distributions i.e. Histograms
 - Can easily determine the curve shape
 - Isn't accurate for a smaller sample
- Analytical: Shapiro-Wilk
 - gives a single valued result which can be compared against alpha
 - also not too accurate

Solution: Use a combination of graphical and analytical methods to determine result

Define:

- Null Hypothesis ($P > 0.05$) = Values are sampled from a population that follows a normal distribution
- Alternate Hypothesis ($P < 0.05$) = Values are **not** sampled from a population that follows a normal distribution

```
In [ ]: import pandas as pd
import numpy as np
from matplotlib import pyplot as plt
from scipy.stats import shapiro
```

```
In [ ]: # State the file name and sheet name
file_name = 'quest_2.xlsx'
sheet_name = 'Sheet1'
```

```
In [ ]: def display_cols(file_name, sheet_name):
'''
returns the list of all the columns in a dataframe along with the original dataframe
df = pd.read_excel(file_name, sheet_name)

# specifically for quest 2 data
df.rename({'I've been feeling optimistic about the future':'OPTIMISM',
'I've been feeling useful':'USEFUL',
'\n1 - very dull\nx\n4 - very bright\n':'BRIGHT or DIM',
'1 - very warm/yellowish\nx\n4 - very cold\n':'YELLOW or BLUE',
'Dealing with problems':'DEALING WITH PROBLEMS',
'Thinking clearly':'THINKING CLEARLY',
'1 - not at all glaring\nx\n4 - very glaring\n':'GLARING',
'Feeling close to other people':'FEELING CLOSE',
'LIGHTING OVERALL IMPRESSION':'OVERALL IMPRESSION'
}, inplace=True, axis=1)

return df.columns, pd.DataFrame(df)

# printing the dataframe and the columns in it
print(f'Columns: {list(display_cols(file_name, sheet_name)[0])} \nDataframe: \n{display_cols(file_name, sheet_name)[1]}')

Columns: ('Start time', 'SLEEP NO', 'What is your I.D.?', 'SLEEP QUALITY', 'SLEEP EASE', 'SLEEP TIME', 'WAKE TIME', 'NO. OF SLEEP HOURS', 'LAST 5 MI
UTES', 'OPTIMISM', 'SLEEP QUALITY WEEK', 'USEFUL', 'BRIGHT or DIM', 'RELAXED', 'YELLOW or BLUE', 'DEALING WITH PROBLEMS', 'THINKING CLEARLY', 'GLA
RING', 'FEELING CLOSE', 'OVERALL IMPRESSION', 'COMMENTS', 'I've been able to make up my own mind about things')
Dataframe:
Start time WEEK NO What is your I.D.? SLEEP QUALITY SLEEP EASE \
0 2022-06-09 15:50:05 WEEK 1 S145 3 NaN 2
1 2022-06-09 19:30:00 WEEK 1 S86 3 3 3
2 2022-06-09 21:41:07 WEEK 1 S86 3 3 3
3 2022-06-09 09:09:00 WEEK 1 S27 4 3 3
4 2022-06-11 09:39:00 WEEK 1 S27 4 3 3
5 2022-06-11 14:50:57 WEEK 1 S21 1 3 3
6 2022-06-11 16:17:39 WEEK 1 S12 2 3 2
7 2022-06-11 17:09:44 WEEK 1 S84 3 3 3
8 2022-06-11 20:02:05 WEEK 1 S88 3 3 3
9 2022-06-11 20:24:23 WEEK 1 S19 2 2 2
10 2022-06-11 23:07:57 WEEK 1 S12 1 1 1
11 2022-06-10 20:00:00 WEEK 2 S14 3 3 3
12 2022-06-17 09:09:00 WEEK 2 S17 4 4 4
13 2022-06-18 09:25:51 WEEK 2 S85 1 4 4
14 2022-06-18 11:44:34 WEEK 2 S31 4 4 4
15 2022-06-18 15:08:26 WEEK 2 S11 2 2 2
16 2022-06-18 17:52:13 WEEK 2 S21 2 3 3
17 2022-06-18 20:01:47 WEEK 2 S81 2 2 2
18 2022-06-18 20:18:40 WEEK 2 S89 4 4 4
19 2022-06-18 20:22:00 WEEK 2 S19 2 2 2
20 2022-06-18 22:06:19 WEEK 2 S12 4 4 4
21 2022-06-18 19:11:37 WEEK 2 S84 2 2 2
22 2022-06-21 14:44:49 WEEK 2 S29 3 3 3
23 2022-06-22 17:55:53 WEEK 2 S86 2 3 3
24 2022-06-23 18:00:00 WEEK 3 S14 3 3 3
25 2022-06-23 19:04:39 WEEK 3 S22 1 1 1
26 2022-06-23 20:08:59 WEEK 3 S86 2 4 4
27 2022-06-24 07:26:55 WEEK 3 S19 2 4 4
28 2022-06-24 15:07:30 WEEK 3 S21 3 3 3
29 2022-06-24 19:30:02 WEEK 3 S31 3 3 3
30 2022-06-24 21:59:27 WEEK 3 S29 3 3 3
31 2022-06-25 09:14:00 WEEK 3 S27 1 1 1
32 2022-06-25 11:05:09 WEEK 3 S12 4 3 3
33 2022-06-25 15:07:49 WEEK 3 S85 1 1 1
34 2022-06-25 15:41:00 WEEK 3 S81 2 1 1
35 2022-06-25 17:28:00 WEEK 3 S94 2 3 3
36 2022-06-25 20:28:22 WEEK 3 S88 3 3 3
37 2022-06-30 19:00:00 WEEK 4 S14 2 3 3
38 2022-07-01 09:00:00 WEEK 4 S17 4 4 4
39 2022-07-01 21:35:54 WEEK 4 S29 3 3 3
40 2022-07-02 09:00:00 WEEK 4 S27 2 3 3
41 2022-07-02 13:34:13 WEEK 4 S31 4 3 3
42 2022-07-02 14:01:13 WEEK 4 S21 3 3 3
43 2022-07-02 15:46:23 WEEK 4 S85 1 1 1
44 2022-07-02 17:07:54 WEEK 4 S88 1 3 3
45 2022-07-02 17:40:35 WEEK 4 S84 1 3 3
46 2022-07-02 01:13:24 WEEK 4 S12 4 4 3
47 2022-07-02 10:14:14 WEEK 4 S19 2 2 2
48 2022-07-07 22:12:15 WEEK 5 S86 3 4 3
49 2022-07-08 12:30:00 WEEK 5 S14 3 3 3
50 2022-07-08 20:18:24 WEEK 5 S85 4 4 4
51 2022-07-08 22:03:54 WEEK 5 S29 3 3 3
52 2022-07-09 11:18:53 WEEK 5 S19 3 3 3
53 2022-07-09 15:01:06 WEEK 5 S81 2 1 1
54 2022-07-09 15:47:45 WEEK 5 S21 2 2 2
55 2022-07-09 18:35:55 WEEK 5 S94 2 1 1
56 2022-07-09 20:02:33 WEEK 5 S88 2 3 3
57 2022-07-09 20:25:08 WEEK 5 S19 2 2 2
```

```
0 10:30 - 12:00 am Before 4:30 am 4 - 5 hours 2 minutes \
1 9:00 - 10:30 pm 4:30 - 6:00 am 5 - 9 hours 4 2
2 After 12:00 am 7:30 - 9:00 am 5 - 7 hours 2
3 9:00 - 10:30 pm 6:00 - 7:30 am 5 - 7 hours 2
4 After 12:00 am 4:30 - 6:00 am 5 - 7 hours 3
5 10:30 - 12:00 am 4:30 - 6:00 am 4 - 5 hours 6
6 After 12:00 am 4:30 - 6:00 am 4 - 5 hours 2
7 After 12:00 am 7:30 - 9:00 am 5 - 7 hours 3
8 After 12:00 am After 10:30 am More than 9 hours 6
9 10:30 - 12:00 am 6:00 - 7:30 am 5 - 7 hours 6
10 After 12:00 am 9:00 - 10:30 am 5 - 7 hours 6
11 9:00 - 10:30 pm 4:30 - 6:00 am 7 - 9 hours 3
12 9:00 - 10:30 pm 6:00 - 7:30 am 5 - 7 hours 3
13 10:30 - 12:00 am 6:00 - 7:30 am 5 - 7 hours 3
14 After 12:00 am 4:30 - 6:00 am Less than 4 hours 1
15 10:30 - 12:00 am 4:30 - 6:00 am 4 - 5 hours 6
16 10:30 - 12:00 am 4:30 - 6:00 am 4 - 5 hours 6
17 After 12:00 am 9:00 - 10:30 am 7 - 9 hours 4
18 After 12:00 am After 10:30 am More than 9 hours 3
19 10:30 - 12:00 am 6:00 - 7:30 am 5 - 7 hours 6
20 10:30 - 12:00 am 9:00 - 10:30 am 7 - 9 hours 3
21 10:30 - 12:00 am 6:00 - 7:30 am 5 - 7 hours 3
22 10:30 - 12:00 am 6:00 - 7:30 am 5 - 7 hours 6
23 After 12:00 am 4:30 - 6:00 am Less than 4 hours 6
24 9:00 - 10:30 pm 4:30 - 6:00 am 5 - 7 hours 9
25 After 12:00 am 7:30 - 9:00 am 4 - 5 hours 9
26 10:30 - 12:00 am 6:00 - 7:30 am 5 - 7 hours 1
27 10:30 - 12:00 am 6:00 - 7:30 am 5 - 9 hours 5
28 10:30 - 12:00 am 4:30 - 6:00 am 5 - 7 hours 5
29 10:30 - 12:00 am 4:30 - 6:00 am 5 - 7 hours 4
30 10:30 - 12:00 am 6:00 - 7:30 am 5 - 9 hours 6
31 After 12:00 am 4:30 - 6:00 am Less than 4 hours 6
32 After 12:00 am 4:30 - 6:00 am 5 - 5 hours 1
33 After 12:00 am 4:30 - 6:00 am Less than 4 hours 3
34 After 12:00 am 4:30 - 6:00 am 4 - 5 hours 3
35 10:30 - 12:00 am 7:30 - 9:00 am 7 - 9 hours 6
36 After 12:00 am 9:00 - 10:30 am 7 - 9 hours 4
37 9:00 - 10:30 pm 4:30 - 6:00 am 7 - 9 hours 4
38 9:00 - 10:30 pm 6:00 - 7:30 am 5 - 7 hours 3
39 10:30 - 12:00 am 6:00 - 7:30 am 5 - 7 hours 6
40 After 12:00 am 6:00 - 7:30 am 5 - 7 hours 6
41 10:30 - 12:00 am 4:30 - 6:00 am 4 - 5 hours 1
42 10:30 - 12:00 am 4:30 - 6:00 am 5 - 7 hours 6
43 After 12:00 am 4:30 - 6:00 am Less than 4 hours 6
44 After 12:00 am 9:00 - 10:30 am 5 - 7 hours 6
45 After 12:00 am 7:30 - 9:00 am 7 - 9 hours 2
46 After 12:00 am 7:30 - 9:00 am 5 - 7 hours 2
47 10:30 - 12:00 am 6:00 - 7:30 am 5 - 7 hours 4
48 After 12:00 am 6:00 - 7:30 am 5 - 7 hours 4
49 9:00 - 10:30 pm 4:30 - 6:00 am 5 - 7 hours 3
50 9:00 - 10:30 pm 6:00 - 7:30 am 5 - 7 hours 3
51 9:00 - 10:30 pm 6:00 - 7:30 am 5 - 7 hours 6
52 After 12:00 am 4:30 - 6:00 am 4 - 5 hours 1
53 9:00 - 10:30 pm 4:30 - 6:00 am Less than 4 hours 6
54 10:30 - 12:00 am 4:30 - 6:00 am 4 - 5 hours 5
55 After 12:00 am 7:30 - 9:00 am 5 - 7 hours 7
56 After 12:00 am After 10:30 am 7 - 9 hours 5
57 10:30 - 12:00 am 7:30 - 9:00 am 5 - 7 hours 5
```

```
OPTIMISM ... BRIGHT or DIM RELAXED YELLOW or BLUE \
0 3.0 ... 2.0 4.0 2.0 NaN
1 3.0 ... 3.0 3.0 1.0 NaN
2 NaN ... NaN NaN NaN NaN
3 4.0 ... 4.0 5.0 3.0 NaN
4 3.0 ... 3.0 2.0 4.0 NaN
5 3.0 ... 3.0 2.0 3.0 NaN
6 2.0 ... 3.0 2.0 2.0 NaN
7 4.0 ... 3.0 5.0 2.0 NaN
8 3.0 ... 3.0 4.0 2.0 NaN
9 2.0 ... 3.0 2.0 2.0 NaN
10 4.0 ... 2.0 3.0 2.0 NaN
11 4.0 ... 3.0 4.0 1.0 NaN
12 4.0 ... 4.0 5.0 3.0 NaN
13 3.0 ... 4.0 3.0 2.0 NaN
14 3.0 ... 3.0 3.0 2.0 NaN
15 2.0 ... 2.0 3.0 3.0 NaN
16 3.0 ... 2.0 2.0 2.0 NaN
17 2.0 ... 2.0 1.0 2.0 NaN
18 3.0 ... 3.0 2.0 3.0 NaN
19 4.0 ... 2.0 2.0 4.0 NaN
20 4.0 ... 3.0 3.0 3.0 NaN
21 NaN ... NaN NaN NaN NaN
22 4.0 ... 3.0 3.0 2.0 NaN
23 NaN ... NaN NaN NaN NaN
24 4.0 ... 3.0 4.0 2.0 NaN
25 3.0 ... 3.0 1.0 1.0 NaN
26 5.0 ... 2.0 5.0 1.0 NaN
27 2.0 ... 2.0 2.0 2.0 NaN
28 4.0 ... 4.0 3.0 5.0 NaN
29 3.0 ... 1.0 3.0 4.0 NaN
30 3.0 ... 3.0 4.0 3.0 NaN
31 3.0 ... 1.0 3.0 2.0 NaN
32 3.0 ... 1.0 2.0 2.0 NaN
33 3.0 ... 3.0 4.0 4.0 NaN
34 3.0 ... 7.0 3.0 3.0 NaN
35 2.0 ... 3.0 4.0 4.0 NaN
36 2.0 ... 3.0 3.0 3.0 NaN
37 4.0 ... 3.0 4.0 3.0 NaN
38 5.0 ... 3.0 5.0 3.0 NaN
39 2.0 ... 3.0 3.0 5.0 NaN
40 3.0 ... 3.0 3.0 3.0 NaN
41 3.0 ... 3.0 3.0 3.0 NaN
42 4.0 ... 3.0 4.0 4.0 NaN
43 2.0 ... 3.0 3.0 3.0 NaN
44 4.0 ... 1.0 2.0 4.0 NaN
45 4.0 ... 5.0 1.0 1.0 NaN
46 4.0 ... 4.0 2.0 2.0 NaN
47 4.0 ... 2.0 2.0 2.0 NaN
48 2.0 ... 2.0 2.0 2.0 NaN
49 4.0 ... 4.0 4.0 4.0 NaN
50 3.0 ... 4.0 3.0 1.0 NaN
51 3.0 ... 2.0 2.0 3.0 NaN
52 2.0 ... 3.0 2.0 1.0 NaN
53 2.0 ... 3.0 4.0 1.0 NaN
54 1.0 ... 2.0 3.0 3.0 NaN
55 3.0 ... 3.0 3.0 3.0 NaN
56 3.0 ... 2.0 3.0 3.0 NaN
57 2.0 ... 2.0 3.0 3.0 NaN
```

```
0 5.0 ... 5.0 2.0 2.0 \
1 4.0 ... 4.0 1.0 3.0
2 NaN ... NaN NaN 5.0
3 5.0 ... 5.0 3.0 3.0
4 3.0 ... 3.0 2.0 3.0
5 3.0 ... 3.0 2.0 3.0
6 4.0 ... 4.0 1.0 4.0
7 5.0 ... 5.0 1.0 2.0
8 3.0 ... 3.0 3.0 2.0
9 3.0 ... 4.0 2.0 2.0
10 5.0 ... 4.0 2.0 4.0
11 3.0 ... 5.0 3.0 5.0
12 3.0 ... 3.0 2.0 3.0
13 3.0 ... 3.0 2.0 4.0
14 3.0 ... 4.0 2.0 3.0
15 2.0 ... 4.0 2.0 2.0
16 4.0 ... 2.0 1.0 2.0
17 2.0 ... 2.0 3.0 3.0
18 3.0 ... 2.0 3.0 3.0
19 4.0 ... 4.0 1.0 5.0
20 NaN ... NaN NaN NaN
21 NaN ... NaN NaN NaN NaN
22 3.0 ... 3.0 2.0 3.0
23 NaN ... NaN NaN NaN NaN
24 4.0 ... 4.0 2.0 4.0
25 1.0 ... 1.0 1.0 1.0
26 1.0 ... 1.0 1.0 1.0
27 2.0 ... 2.0 2.0 3.0
28 4.0 ... 4.0 3.0 3.0
29 3.0 ... 3.0 3.0 3.0
30 3.0 ... 4.0 2.0 3.0
31 5.0 ... 5.0 3.0 5.0
32 2.0 ... 2.0 1.0 2.0
33 2.0 ... 3.0 1.0 2.0
34 3.0 ... 4.0 1.0 3.0
35 3.0 ... 3.0 3.0 3.0
36 3.0 ... 4.0 2.0 4.0
37 5.0 ... 5.0 3.0 5.0
38 3.0 ... 3.0 2.0 3.0
39 3.0 ... 2.0 2.0 4.0
40 3.0 ... 3.0 3.0 3.0
41 3.0 ... 3.0 3.0 3.0
42 5.0 ... 4.0 3.0 3.0
43 4.0 ... 3.0 2.0 2.0
44 3.0 ... 2.0 2.0 2.0
45 5.0 ... 5.0 1.0 1.0
46 4.0 ... 4.0 2.0 3.0
47 5.0 ... 2.0 2.0 2.0
48 3.0 ... 2.0 1.0 1.0
49 4.0 ... 4.0 3.0 3.0
50 3.0 ... 3.0 3.0 3.0
51 3.0 ... 3.0 3.0 3.0
52 3.0 ... 3.0 2.0 3.0
53 2.0 ... 1.0 2.0 1.0
54 4.0 ... 3.0 4.0 4.0
55 1.0 ... 2.0 3.0 1.0
56 3.0 ... 2.0 2.0 2.0
57 3.0 ... 2.0 3.0 3.0
```

```
0 5.0 ... 5.0 2.0 2.0 \
1 4.0 ... 4.0 1.0 3.0
2 NaN ... NaN NaN 5.0
3 5.0 ... 5.0 3.0 3.0
4 3.0 ... 3.0 2.0 3.0
5 3.0 ... 3.0 2.0 3.0
6 4.0 ... 4.0 1.0 4.0
7 5.0 ... 5.0 1.0 2.0
8 3.0 ... 3.0 3.0 2.0
9 3.0 ... 4.0 2.0 2.0
10 5.0 ... 4.0 2.0 4.0
11 3.0 ... 5.0 3.0 5.0
12 3.0 ... 3.0 2.0 3.0
13 3.0 ... 3.0 2.0 4.0
14 3.0 ... 4.0 2.0 3.0
15 2.0 ... 4.0 2.0 2.0
16 4.0 ... 2.0 1.0 2.0
17 2.0 ... 2.0 3.0 3.0
18 3.0 ... 2.0 3.0 3.0
19 4.0 ... 4.0 1.0 5.0
20 NaN ... NaN NaN NaN
21 NaN ... NaN NaN NaN NaN
22 3.0 ... 3.0 2.0 3.0
23 NaN ... NaN NaN NaN NaN
24 4.0 ... 4.0 2.0 4.0
25 1.0 ... 1.0 1.0 1.0
26 1.0 ... 1.0 1.0 1.0
27 2.0 ... 2.0 2.0 3.0
28 4.0 ... 4.0 3.0 3.0
29 3.0 ... 3.0 3.0 3.0
30 3.0 ... 4.0 2.0 3.0
31 5.0 ... 5.0 3.0 5.0
32 2.0 ... 2.0 1.0 2.0
33 2.0 ... 3.0 1.0 2.0
34 3.0 ... 4.0 1.0 3.0
35 3.0 ... 3.0 3.0 3.0
36 3.0 ... 4.0 2.0 4.0
37 5.0 ... 5.0 3.0 5.0
38 3.0 ... 3.0 2.0 3.0
39 3.0 ... 2.0 2.0 4.0
40 3.0 ... 3.0 3.0 3.0
41 3.0 ... 3.0 3.0 3.0
42 5.0 ... 4.0 3.0 3.0
43 4.0 ... 3.0 2.0 2.0
44 3.0 ... 2.0 2.0 2.0
45 5.0 ... 5.0 1.0 1.0
46 4.0 ... 4.0 2.0 3.0
47 5.0 ... 2.0 2.0 2.0
48 3.0 ... 2.0 1.0 1.0
49 4.0 ... 4.0 3.0 3.0
50 3.0 ... 3.0 3.0 3.0
51 3.0 ... 3.0 2.0 3.0
52 3.0 ... 3.0 2.0 1.0
53 2.0 ... 1.0 2.0 1.0
54 4.0 ... 3.0 4.0 4.0
55 1.0 ... 2.0 3.0 1.0
56 3.0 ... 2.0 2.0 2.0
57 3.0 ... 2.0 3.0 3.0
```

```
0 5.0 ... 5.0 2.0 2.0 \
1 4.0 ... 4.0 1.0 3.0
2 NaN ... NaN NaN 5.0
3 5.0 ... 5.0 3.0 3.0
4 3.0 ... 3.0 2.0 3.0
5 3.0 ... 3.0 2.0 3.0
6 4.0 ... 4.0 1.0 4.0
7 5.0 ... 5.0 1.0 2.0
8 3.0 ... 3.0 3.0 2.0
9 3.0 ... 4.0 2.0 2.0
10 5.0 ... 4.0 2.0 4.0
11 3.0 ... 5.0 3.0 5.0
12 3.0 ... 3.0 2.0 3.0
13 3.0 ... 3.0 2.0 4.0
14 3.0 ... 4.0 2.0 3.0
15 2.0 ... 4.0 2.0 2.0
16 4.0 ... 2.0 1.0 2.0
17 2.0 ... 2.0 3.0 3.0
18 3.0 ... 2.0 3.0 3.0
19 4.0 ... 4.0 1.0 5.0
20 NaN ... NaN NaN NaN
21 NaN ... NaN NaN NaN NaN
22 3.0 ... 3.0 2.0 3.0
23 NaN ... NaN NaN NaN NaN
24 4.0 ... 4.0 2.0 4.0
25 1.0 ... 1.0 1.0 1.0
26 1.0 ... 1.0 1.0 1.0
27 2.0 ... 2.0 2.0 3.0
28 4.0 ... 4.0 3.0 3.0
29 3.0 ... 3.0 3.0 3.0
30 3.0 ... 4.0 2.0 3.0
31 5.0 ... 5.0 3.0 5.0
32 2.0 ... 2.0 1.0 2.0
33 2.0 ... 3.0 1.0 2.0
34 3.0 ... 4.0 1.0 3.0
35 3.0 ... 3.0 3.0 3.0
36 3.0 ... 4.0 2.0 4.0
37 5.0 ... 5.0 3.0 5.0
38 3.0 ... 3.0 2.0 3.0
39 3.0 ... 2.0 2.0 4.0
40 3.0 ... 3.0 3.0 3.0
41 3.0 ... 3.0 3.0 3.0
42 5.0 ... 4.0 3.0 3.0
43 4.0 ... 3.0 2.0 2.0
44 3.0 ... 2.0 2.0 2.0
45 5.0 ... 5.0 1.0 1.0
46 4.0 ... 4.0 2.0 3.0
47 5.0 ... 2.0 2.0 2.0
48 3.0 ... 2.0 1.0 1.0
49 4.0 ... 4.0 3.0 3.0
50 3.0 ... 3.0 3.0 3.0
51 3.0 ... 3.0 2.0 3.0
52 3.0 ... 3.0 2.0 1.0
53 2.0 ... 1.0 2.0 1.0
54 4.0 ... 3.0 4.0 4.0
55 1.0 ... 2.0 3.0 1.0
56 3.0 ... 2.0 2.0 2.0
57 3.0 ... 2.0 3.0 3.0
```

```
0 5.0 ... 5.0 2.0 2.0 \
1 4.0 ... 4.0 1.0 3.0
2 NaN ... NaN NaN 5.0
3 5.0 ... 5.0 3.0 3.0
4 3.0 ... 3.0 2.0 3.0
5 3.0 ... 3.0 2.0 3.0
6 4.0 ... 4.0 1.0 4.0
7 5.0 ... 5.0 1.0 2.0
8 3.0 ... 3.0 3.0 2.0
9 3.0 ... 4.0 2.0 2.0
10 5.0 ... 4.0 2.0 4.0
11 3.0 ... 5.0 3.0 5.0
12 3.0 ... 3.0 2.0 3.0
13 3.0 ... 3.0 2.0 4.0
14 3.0 ... 4.0 2.0 3.0
15 2.0 ... 4.0 2.0 2.0
16 4.0 ... 2.0 1.0 2.0
17 2.0 ... 2.0 3.0 3.0
18 3.0 ... 2.0 3.0 3.0
19 4.0 ... 4.0 1.0 5.0
20 NaN ... NaN NaN NaN
21 NaN ... NaN NaN NaN NaN
22 3.0 ... 3.0 2.0 3.0
23 NaN ... NaN NaN NaN NaN
24 4.0 ... 4.0 2.0 4.0
25 1.0 ... 1.0 1.0 1.0
26 1.0 ... 1.0 1.0 1.0
27 2.0 ... 2.0 2.0 3.0
28 4.0 ... 4.0 3.0 3.0
29 3.0 ... 3.0 3.0 3.0
30 3.0 ... 4.0 2.0 3.0
31 5.0 ... 5.0 3.0 5.0
32 2.0 ... 2.0 1.0 2.0
33 2.0 ... 3.0 1.0 2.0
34 3.0 ... 4.0 1.0 3.0
35 3.0 ... 3.0 3.0 3.0
36 3.0 ... 4.0 2.0 4.0
37 5.0 ... 5.0 3.0 5.0
38 3.0 ... 3.0 2.0 3.0
39 3.0 ... 2.0 2.0 4.0
40 3.0 ... 3.0 3.0 3.0
41 3.0 ... 3.0 3.0 3.0
42 5.0 ... 4.0 3.0 3.0
43 4.0 ... 3.0 2.0 2.0
44 3.0 ... 2.0 2.0 2.0
45 5.0 ... 5.0 1.0 1.0
46 4.0 ... 4.0 2.0 3.0
47 5.0 ... 2.0 2.0 2.0
48 3.0 ... 2.0 1.0 1.0
49 4.0 ... 4.0 3.0 3.0
50 3.0 ... 3.0 3.0 3.0
51 3.0 ... 3.0 2.0 3.0
52 3.0 ... 3.0 2.0 1.0
53 2.0 ... 1.0 2.0 1.0
54 4.0 ... 3.0 4.0 4.0
55 1.0 ... 2.0 3.0 1.0
56 3.0 ... 2.0 2.0 2.0
57 3.0 ... 2.0 3.0 3.0
```

```
0 5.0 ... 5.0 2.0 2.0 \
1 4.0 ... 4.0 1.0 3.0
2 NaN ... NaN NaN 5.0
3 5.0 ... 5.0 3.0 3.0
4 3.0 ... 3.0 2.0 3.0
5 3.0 ... 3.0 2.0 3.0
6 4.0 ... 4.0 1.0 4.0
7 5.0 ... 5.0 1.0 2.0
8 3.0 ... 3.0 3.0 2.0
9 3.0 ... 4.0 2.0 2.0
10 5.0 ... 4.0 2.0 4.0
11 3.0 ... 5.0 3.0 5.0
12 3.0 ... 3.0 2.0 3.0
13 3.0 ... 3.0 2.0 4.0
14 3.0 ... 4.0 2.0 3.0
15 2.0 ... 4.0 2.0 2.0
16 4.0 ... 2.0 1.0 2.0
17 2.0 ... 2.0 3.0 3.0
18 3.0 ... 2.0 3.0 3.0
19 4.0 ... 4.0 1.0 5.0
20 NaN ... NaN NaN NaN
21 NaN ... NaN NaN NaN NaN
22 3.0 ... 3.0 2.0 3.0
23 NaN ... NaN NaN NaN NaN
24 4.0 ... 4.0 2.0 4.0
25 1.0 ... 1.0 1.0 1.0
26 1.0 ... 1.0 1.0 1.0
27 2.0 ... 2.0 2.0 3.0
28 4.0 ... 4.0 3.0 3.0
29 3.0 ... 3.0 3.0 3.0
30 3.0 ... 4.0 2.0 3.0
31 5.0 ... 5.0 3.0 5.0
32 2.0 ... 2.0 1.0 2.0
33 2.0 ... 3.0 1.0 2.0
34 3.0 ... 4.0 1.0 3.0
35 3.0 ... 3.0 3.0 3.0
36 3.0 ... 4.0 2.0 4.0
37 5.0 ... 5.0 3.0 5.0
38 3.0 ... 3.0 2.0 3.0
39 3.0 ... 2.0 2.0 4.0
40 3.0 ... 3.0 3.0 3.0
41 3.0 ... 3.0 3.0 3.0
42 5.0 ... 4.0 3.0 3.0
43 4.0 ... 3.0 2.0 2.0
44 3.0 ... 2.0 2.0 2.0
45 5.0 ... 5.0 1.0 1.0
46 4.0 ... 4.0 2.0 3.0
47 5.0 ... 2.0 2.0 2.0
48 3.0 ... 2.0 1.0 1.0
49 4.0 ... 4.0 3.0 3.0
50 3.0 ... 3.0 3.0 3.0
51 3.0 ... 3.0 2.0 3.0
52 3.0 ... 3.0 2.0 1.0
53 2.0 ... 1.0 2.0 1.0
54 4.0 ... 3.0 4.0 4.0
55 1.0 ... 2.0 3.0 1.0
56 3.0 ... 2.0 2.0 2.0
57 3.0 ... 2.0 3.0 3.0
```

```
0 5.0 ... 5.0 2.0 2.0 \
1 4.0 ... 4.0 1.0 3.0
2 NaN ... NaN NaN 5.0
3 5.0 ... 5.0 3.0 3.0
4 3.0 ... 3.0 2.0 3.0
5 3.0 ... 3.0 2.0 3.0
6 4.0 ... 4.0 1.0 4.0
7 5.0 ... 5.0 1.0 2.0
8 3.0 ... 3.0 3.0 2.0
9 3.0 ... 4.0 2.0 2.0
10 5.0 ... 4.0 2.0 4.0
11 3.0 ... 5.0 3.0 5.0
12 3.0 ... 3.0 2.0 3.0
13 3.0 ... 3.0 2.0 4.0
14 3.0 ... 4.0 2.0 3.0
15 2.0 ... 4.0 2.0 2.0
16 4.0 ... 2.0 1.0 2.0
17 2.0 ... 2.0 3.0 3.0
18 3.0 ... 2.0 3.0 3.0
19 4.0 ... 4.0 1.0 5.0
20 NaN ... NaN NaN NaN
21 NaN ... NaN NaN NaN NaN
22 3.0 ... 3.0 2.0 3.0
23 NaN ... NaN NaN NaN NaN
24 4.0 ... 4.
```