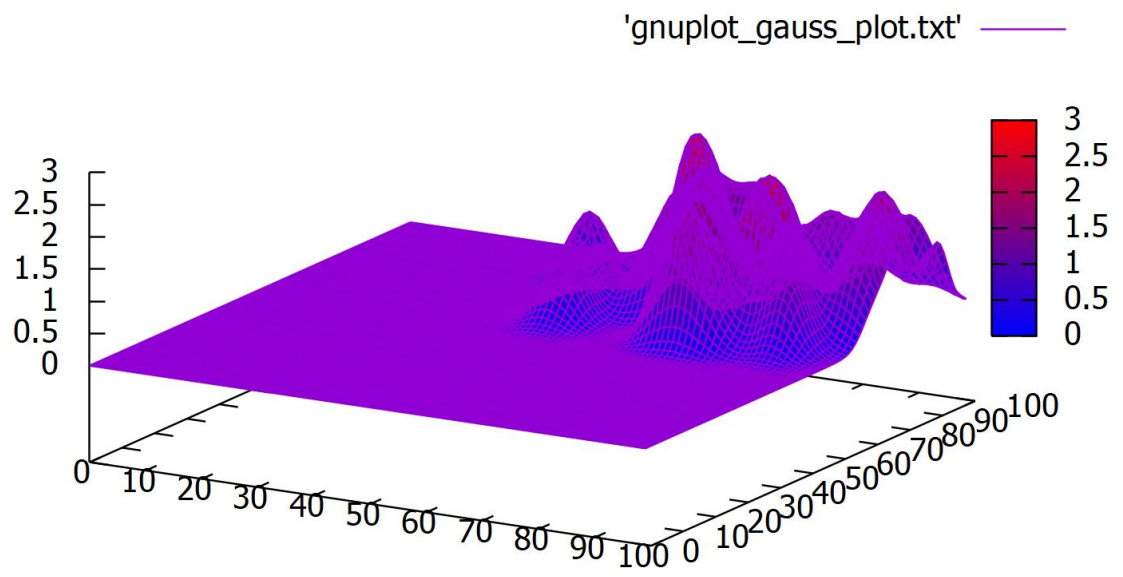


Пример работы программы:

```
Enter configuration file name: config.txt
Select input source (keyboard/file): file
21.02.2025 19:21:26 - Reading commands from file: 8.txt
21.02.2025 19:21:26 - Interface received 'init' and pass to Control
21.02.2025 19:21:26 - Control received 'init' and pass to Field
21.02.2025 19:21:26 - Field created with size 100x100
Field initialized with size 100x100
21.02.2025 19:21:26 - Interface received 'g' and pass to Control
21.02.2025 19:21:26 - Gauss applied to Field
Added Gauss with parameters (h=1, x0=60, y0=70, sigma_x=1.8, sigma_y=1.9)
21.02.2025 19:21:26 - Interface received 'g' and pass to Control
21.02.2025 19:21:26 - Gauss applied to Field
Added Gauss with parameters (h=1.1, x0=80, y0=80, sigma_x=2, sigma_y=1.7)
21.02.2025 19:21:26 - Interface received 'g' and pass to Control
21.02.2025 19:21:26 - Gauss applied to Field
Added Gauss with parameters (h=0.9, x0=90, y0=60, sigma_x=1.5, sigma_y=2)
21.02.2025 19:21:26 - Interface received 'g' and pass to Control
21.02.2025 19:21:26 - Gauss applied to Field
Added Gauss with parameters (h=1.2, x0=50, y0=100, sigma_x=2.2, sigma_y=1.6)
21.02.2025 19:21:26 - Interface received 'g' and pass to Control
21.02.2025 19:21:26 - Gauss applied to Field
Added Gauss with parameters (h=1.3, x0=120, y0=80, sigma_x=1.7, sigma_y=1.8)
21.02.2025 19:21:26 - Interface received 'g' and pass to Control
21.02.2025 19:21:26 - Gauss applied to Field

Added Gauss with parameters (h=1, x0=75, y0=85, sigma_x=1.7, sigma_y=1.8)
21.02.2025 19:21:26 - Interface received 'generate' and pass to Control
21.02.2025 19:21:26 - Control passed 'generate' command to Field
21.02.2025 19:21:26 - Field completed applying all gaussses
Generated field with applied Gaussians
21.02.2025 19:21:26 - Field saved to Gnuplot file: gnuplot_gauss_plot.txt
21.02.2025 19:21:26 - Field generated Gnuplot file: gauss_plot
Field saved to Gnuplot file: gauss_plot
Field saved to BMP file: bmp_538.bmp
21.02.2025 19:21:26 - Interface received 'save bmp' and pass to Control
21.02.2025 19:21:26 - Control received 'save bmp' and pass to Field
21.02.2025 19:21:26 - Field completed save to BMP file: bmp_538.bmp
21.02.2025 19:21:26 - Field loaded from file: bmp_538.bmp
Component 1: Center (40, 85), Square (37, 82) to (43, 88), Size: 41
Component 2: Center (74.182, 77.3251), Square (45, 52) to (99, 99), Size: 1830
Total components: 2
21.02.2025 19:21:26 - Interface received wave and pass to Control
21.02.2025 19:21:26 - Control received wave and pass to Wave
21.02.2025 19:21:26 - Wave count: 2 components.
Cluster 1:
(83.2717, 64.387)
Cluster 2:
(60.7783, 68.9423)
Cluster 3:
Cluster 3:
(57.2426, 89.9653)
Cluster 4:
(86.4895, 85.669)
Clustering completed with 4 clusters and 1 centroids per cluster.
21.02.2025 19:21:26 - Interface received 'group' and pass to Control
21.02.2025 19:21:26 - Control received 'group' and pass to Field
21.02.2025 19:21:26 - Field completed k-means
Field saved to BMP file: bmp_538.bmp
21.02.2025 19:21:26 - Interface received 'save bmp' and pass to Control
21.02.2025 19:21:26 - Control received 'save bmp' and pass to Field
21.02.2025 19:21:26 - Field completed save to BMP file: bmp_538.bmp
PS C:\Users\79129\Pictures\c++> █
```



```
init 100 100
g 1.0 60.0 70.0 1.8 1.9
g 1.1 80.0 80.0 2.0 1.7
g 0.9 90.0 60.0 1.5 2.0
g 1.2 50.0 100.0 2.2 1.6
g 1.3 120.0 80.0 1.7 1.8
g 1.0 55.0 95.0 2.0 1.5
g 1.4 85.0 65.0 1.8 2.2
g 1.1 70.0 110.0 1.3 1.7
g 0.8 95.0 70.0 2.1 1.9
g 1.5 60.0 80.0 1.6 1.5
g 1.2 100.0 90.0 2.0 1.8
g 1.0 40.0 85.0 1.7 1.6
g 1.3 75.0 55.0 2.2 1.4
g 0.9 110.0 100.0 1.8 1.7
g 1.4 65.0 70.0 1.5 1.9
g 1.1 85.0 95.0 2.0 1.6
g 1.0 50.0 60.0 1.7 2.1
g 1.2 95.0 80.0 1.8 1.5
g 1.3 70.0 75.0 2.2 1.8
g 0.8 60.0 100.0 1.9 2.0
g 1.5 80.0 65.0 1.6 1.7
g 1.1 55.0 90.0 2.0 1.8
g 1.4 90.0 85.0 1.8 1.9
g 1.2 75.0 60.0 2.1 1.5
g 1.0 85.0 70.0 1.7 2.2
g 1.3 65.0 95.0 2.0 1.6
g 0.9 100.0 80.0 1.8 1.7
g 1.4 70.0 60.0 1.5 1.9
g 1.1 90.0 100.0 2.0 1.8
g 1.2 80.0 90.0 1.7 1.6
g 1.0 60.0 85.0 2.1 1.8
g 1.3 95.0 75.0 1.8 1.7
g 0.9 50.0 70.0 1.6 2.0
g 1.5 65.0 80.0 1.8 1.7
g 1.0 75.0 85.0 1.7 1.8
generate
gnuplot gauss_plot
save bmp
wave bmp_538.bmp
group 4 1
save bmp
```

Пример командного файла