Hana Rahmawati
662023006

TUGAS 4 – KOMPUTASI MATEMATIKA

Tugas_04.m

```
@@ -0,0 +1,192 @@
+ % KURVA KUPU-KUPU PARAMETRIK
+ t = linspace(0, 12*pi, 1000);
+ x = sin(t) .* (exp(cos(t)) - 2*cos(4*t) - sin(t/12).^5);
+ y = cos(t) .* (exp(cos(t)) - 2*cos(4*t) - sin(t/12).^5);
+ z = sin(t/3);
+ figure(1);
+ plot3(x, y, z, 'm', 'LineWidth', 1.5);
+ grid on; axis equal;
+
+
+ % PERMUKAAN SPIRAL
+ theta = linspace(0, 4*pi, 100);
+ r = linspace(0.5, 2, 100);
+ [Theta, R] = meshgrid(theta, r);
+ X = R .* cos(Theta);
+ Y = R .* sin(Theta);
+ Z = R;
+ figure(2);
+ mesh(X, Y, Z)
+ colormap(winter)
+
```

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```
+
+ % FLOWER MESH DOME
+ theta = linspace(0, 2*pi, 100);
+ phi = linspace(0, pi/2, 50);
+ [Theta, Phi] = meshgrid(theta, phi);
+ R = 1 + 0.3*cos(6*Theta);
+ X = R .* sin(Phi) .* cos(Theta);
+ Y = R .* sin(Phi) .* sin(Theta);
+ Z = R .* cos(Phi);
+ figure(3);
+ mesh(X, Y, Z)
+ colormap(jet)
+ axis equal
+
+
+ % LATTICE SHELL
+ [u, v] = meshgrid(linspace(0, pi, 60), linspace(0, 2*pi, 60));
+ r = 1 + 0.2*sin(10*v + 3*u);
+ x = r .* sin(u) .* cos(v);
+ y = r .* sin(u) .* sin(v);
+ z = r .* cos(u);
+ figure(4);
+ mesh(x, y, z)
+ colormap(cool)
+ axis equal
```

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```
47  +
48  +
49  + % WAVY STAR DISC
50  + [x, y] = meshgrid(-3:0.05:3);
51  + r = sqrt(x.^2 + y.^2);
52  + theta = atan2(y, x);
53  + z = cos(5*theta) .* exp(-r.^2);
54  + colormap(winter)
55  + axis equal
56  + figure(5);
57  + contourf(x, y, z, 50)
58  +
59  +
60  + % GELOMBANG PAPAN SELANCAR
61  + [x, y] = meshgrid(-10:0.2:10, -10:0.2:10);
62  + z = sin(x) + cos(y);
63  + figure(6);
64  + surf(x, y, z);
65  + shading interp; colormap cool;
66  + xlabel('X'); ylabel('Y'); zlabel('Z');
```

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```
+
+ % COSMIC FUNNEL GRID
+ theta = linspace(0, 6*pi, 100);
+ r = linspace(0.2, 2, 100);
+ [Theta, R] = meshgrid(theta, r);
+ X = R .* cos(Theta);
+ Y = R .* sin(Theta);
+ Z = log(R) .* sin(3*Theta);
+ figure(7);
+ mesh(X, Y, Z)
+ colormap(summer)
+ axis equal
+
+
+ % SPIRAL CONE FLOW
+ theta = linspace(0, 6*pi, 200);
+ r = linspace(0.1, 3, 200);
+ [Theta, R] = meshgrid(theta, r);
+ X = R .* cos(Theta);
+ Y = R .* sin(Theta);
+ Z = R .* log(R + 1) .* sin(2*Theta);
+ figure(8);
+ mesh(X, Y, Z)
+ colormap(autumn)
+ axis equal
```

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```
95  + % LOG SPIRAL RIDGE
96  + theta = linspace(0, 4*pi, 300);
97  + r = exp(0.1 * theta);
98  + [Theta, R] = meshgrid(theta, r);
99  + X = R .* cos(Theta);
100 + Y = R .* sin(Theta);
101 + Z = sin(R);
102 + figure(9);
103 + surf(X, Y, Z)
104 + shading interp
105 + colormap(cool)
106 + axis equal
107 +
108 +
109 + % TWISTED GALAXY SURFACE
110 + theta = linspace(0, 8*pi, 250);
111 + r = linspace(0.5, 2.5, 250);
112 + [Theta, R] = meshgrid(theta, r);
113 + X = R .* cos(Theta);
114 + Y = R .* sin(Theta);
115 + Z = R .* sin(Theta/2) .* cos(3*R);
116 + figure(10);
117 + mesh(X, Y, Z)
118 + colormap(pink)
119 + axis equal
```

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```
+ % % FRACTAL RIPPLE SPIRAL
+ theta = linspace(0, 10*pi, 400);
+ r = linspace(0.1, 3, 400);
+ [Theta, R] = meshgrid(theta, r);
+ X = R .* cos(Theta);
+ Y = R .* sin(Theta);
+ Z = sin(5*log(R + 1)) .* cos(Theta);
+ figure(11);
+ surf(X, Y, Z)
+ colormap(cool)
+ shading interp
+ axis equal
+
+
+ % %DIMENSIONAL WARP GRID
+ theta = linspace(0, 6*pi, 200);
+ r = linspace(0.5, 2, 200);
+ [Theta, R] = meshgrid(theta, r);
+ X = R .* cos(Theta);
+ Y = R .* sin(Theta);
+ Z = atan(R .* sin(Theta)) + cos(3*Theta);
+ figure(12);
+ mesh(X, Y, Z)
+ colormap(cool)
+ axis equal
```

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```
+
+ % BUNGA TERATAI
+ theta = linspace(0, 2*pi, 1000);
+ r = abs(sin(3*theta) .* cos(2*theta)).^0.8;  % kelopak tumpul
+ x = r .* cos(theta);
+ y = r .* sin(theta);
+ figure(13);
+ plot(x, y, 'g', 'LineWidth', 2);
+ axis equal;
+ grid on;
+
+
+ % BINTANG LAUT PARAMETRIK
+ theta = linspace(0, 2*pi, 1000);
+ r = 1 + 0.5*sin(5*theta);  % 5 lengan
+ x = r .* cos(theta);
+ y = r .* sin(theta);
+ figure(14);
+ plot(x, y, 'r', 'LineWidth', 2);
+ axis equal;
+ grid on;
```

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```
170 +
171 + % DAUN SEMANGGI TIGA DAUN
172 + theta = linspace(0, 2*pi, 1000);
173 + r = sin(3*theta);  % 3 kelopak hati
174 + x = r .* cos(theta);
175 + y = r .* sin(theta);
176 + figure(15);
177 + plot(x, y, 'g', 'LineWidth', 2);
178 + axis equal;
179 + grid on;
180 +
181 +
182 + % PERMUKAAN LOGO BERGELOMBANG ASIMETRIS
183 + x = -3:0.1:3;
184 + y = -3:0.1:3;
185 + [X, Y] = meshgrid(x, y);
186 + Z = sin(X) + cos(Y) + 0.3*X.*Y;
187 + figure(16);
188 + mesh(X, Y, Z);
189 + colormap(spring);
```