Lab-3: Program to compute area, Volume and centre of gravity

1. Write a Python program to evaluate the integral $\int_0^1 \int_0^x (x^2 + y^2) dy dx$.

2. Write a Python program to evaluate the integral $\int_0^3 \int_0^{3-x} \int_0^{3-x-y} (xyz) dz dy dx$.

3. Write a Python program to find the area of an ellipse by double integration $A = 4\int_0^a \int_0^{(b/a)\sqrt{(a^2-x^2)}} dy dx$.

4. Write a Python program to find the area of a cardioid $r = a(1+\cos\theta)$.

5. Write a Python program to find the volume of the tetrahedron bounded by the planes

$x = 0, y = 0, z = 0$ and $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 1$.