Multiple Integration
Iteration of Double Integrals

Question
Calculate the given iterated integral.

$$\int_0^1 dx \int_0^x (xy + y^2)\, dy$$

Answer

$$\begin{aligned} & \int_0^1 dx \int_0^x (xy + y^2)\, dy \\ = & \int_0^1 dx \left(\frac{xy^2}{2} + \frac{y^3}{3} \right) \Bigg|_{y=0}^{y=x} \\ = & \frac{5}{6} \int_0^1 x^3\, dx = \frac{5}{2} \end{aligned}$$