$$y''(t) + \sin(y(t)) = 0, \quad y(0) = 1, \quad y(0) -$$

$$y_2'(t) = -\sin(y(t)) = f(y)$$

$$k_1 = f(u_n) = -\sin(u_n)$$

$$k_2 = f(u_n + \tfrac{h}{2}k_1) = f(u_n - \tfrac{h}{2}\sin(u_n)) = -\sin(u_n - \tfrac{h}{2}\sin(u_n))$$

$$k_3 = f(u_n + \tfrac{h}{2}k_2) = f\left(u_n - \tfrac{h}{2}\sin(u_n - \tfrac{h}{2}\sin(u_n))\right) = -\sin\left(u_n - \tfrac{h}{2}\sin(u_n - \tfrac{h}{2}\sin(u_n))\right)$$

$$k_4 = -\sin\left(u_n - \tfrac{h}{2}\sin\left(u_n - \tfrac{h}{2}\sin\left(u_n - \tfrac{h}{2}\sin(u_n)\right)\right)\right)$$

$$u_{n+1} = u_n + \frac{h}{6}(k_1 + 2k_2 + 2k_3 + k_4)$$

$$= u_n + \frac{h}{6}\left(-\sin(u_n) - 2\sin(u_n - \tfrac{h}{2}\sin(u_n)) - 2\sin\left(u_n - \tfrac{h}{2}\sin(u_n - \tfrac{h}{2}\sin(u_n))\right) - \cdots\right.$$

$$\left.\cdots - \sin\left(u_n - \tfrac{h}{2}\sin\left(u_n - \tfrac{h}{2}\sin\left(u_n - \tfrac{h}{2}\sin(u_n)\right)\right)\right)\right)$$

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