import matplotlib.pyplot as plt

# داده‌های سیاست فقط بازتخصیص

rc\_values = [round(0.1 + i\*0.05, 2) for i in range(19)]

avg\_cost\_reallocate = [

 7.565379, 7.570429, 7.575479, 7.580529, 7.585578, 7.590628, 7.595678, 7.600728,

 7.605778, 7.610828, 7.615878, 7.620928, 7.625978, 7.631028, 7.636078, 7.641127,

 7.646177, 7.651227, 7.656277

]

# داده‌های سیاست فقط نگهداری

avg\_cost\_maintain = [7.983187] \* 19

# داده‌های سیاست ترکیبی

avg\_cost\_combined = [

 7.374806, 7.377716, 7.380626, 7.383536, 7.386446, 7.389356, 7.392266, 7.395176,

 7.398086, 7.400996, 7.403906, 7.406817, 7.409727, 7.412637, 7.415547, 7.418457,

 7.421367, 7.424277, 7.427187

]

# محاسبه افزایش درصدی نسبت به سیاست ترکیبی

increase\_maintain = [(m - c) / c \* 100 for m, c in zip(avg\_cost\_maintain, avg\_cost\_combined)]

increase\_reallocate = [(r - c) / c \* 100 for r, c in zip(avg\_cost\_reallocate, avg\_cost\_combined)]

fig, axes = plt.subplots(1, 2, figsize=(14, 6))

# نمودار (a)

axes[0].plot(rc\_values, avg\_cost\_reallocate, '-^',color='orange', label="reallocate-only policy")

axes[0].plot(rc\_values, avg\_cost\_maintain, '-o', color='red', label="maintain-only policy")

axes[0].plot(rc\_values, avg\_cost\_combined, '-s',color='blue', label="reallocate-and-maintain policy")

axes[0].set\_xlabel("Cost of unit reallocation")

axes[0].set\_ylabel("Minimal expected cost per unit time")

axes[0].set\_title("(a) Minimal average cost per unit time")

axes[0].legend()

# نمودار (b)

axes[1].plot(rc\_values, increase\_maintain, label="maintain-only policy", color="black")

axes[1].plot(rc\_values, increase\_reallocate, '--', label="reallocate-only policy", color="black")

axes[1].set\_xlabel("Cost of unit reallocation")

axes[1].set\_ylabel("Percentage increase in cost")

axes[1].set\_title("(b) Cost increase (%)")

axes[1].legend()

plt.tight\_layout()

plt.show()