

Practice Problem #2: 400-meter Relay Team Problem

Coach Morrison has been tasked with putting together a relay team for the 400-meter relay for the musician festival olympic games. Each swimmer must swim 100 meters of breaststroke, backstroke, butterfly, or freestyle. Coach believes that each swimmer will attain the times given below. To minimize the team's time limit for the race, which swimmer should swim which stroke?

Swimmer	Freestyle	Breaststroke	Butterfly	Backstroke
Beyonce	54	54	51	53
Taylor Swift	51	57	52	52
Pharrell	50	53	54	56
Eminem	56	54	55	53

Table 1: Swimmer times in seconds

1 Concrete Model:

Formulate the 400-meter relay problem above as a **concrete** mathematical programming model to minimize the team's total time. Clearly define and describe all decision variables, constraints, and the objective.

2 Hungarian Algorithm:

Determine the optimal 400-meter relay line-up using the Hungarian Algorithm.