SA405 – AMP Lesson #1

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, constrints, and the objective.

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2 Hungarian Algorithm:

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

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