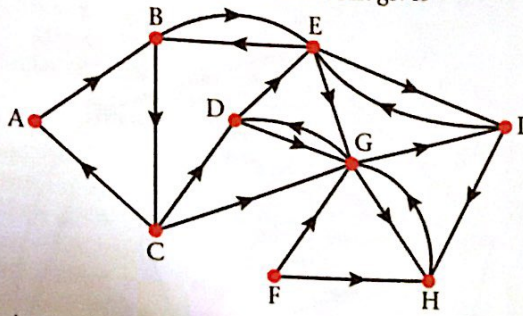


Adding these arcs to the network gives



A possible route is:

A - B - E - I - H - G - I - E - B - C - D - G -
D - E - G - H - F - G - C - A.

length = 51.4 + 9.9 = 61.3 km

- c** length = 51.4 + 9.9 = 61.3 km
d If BD is included B and D now have even valency. Only H and I have odd valency. So the shortest path from H to I needs to be repeated.

Length of new route = 51.4 + BD + path from H to I
 = 51.4 + 6.4 + 3.4
 = 61.2 km

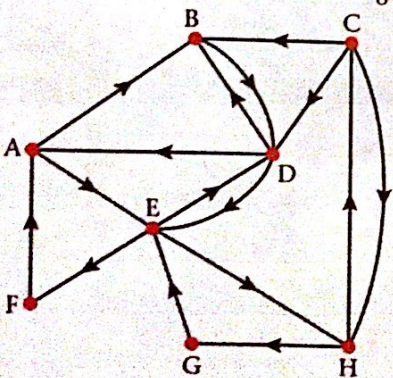
This is (slightly) shorter than the previous route so choose to grit BD since it saves 0.1 km.

- 5 a** The route inspection algorithm (method as shown in main text page 69)
b Odd valencies B, C, E, H.
 Considering all possible complete pairings and their weight
 BC + EH = 68 + 150 = 218
 BE + CH = 95 + 73 = 168 ← least weight
 BH + CE = 141 + 85 = 226

Shortest routes: BE is BDE; BH is BCH, CE is CDE

Repeat BD, DE and CH

Adding these arcs to the network gives



A possible route is:

A - B - D - B - C - H - C - D - E - D - A - E -
H - G - E - F - A.

length = 1011 + 168
 = 1179 m

- c** This would make B the start and C the finish. We would have to repeat the shortest path between E and H only.
 New route = 1011 + 150 = 1161 m.
 1161 < 1179
 So this would decrease the total distance by 18 m.
6 a The route inspection algorithm - description in main text on page 69.

- b** Odd vertices B, D, F, H

Considering all complete pairings

BD + FH = 14 + 15 = 29

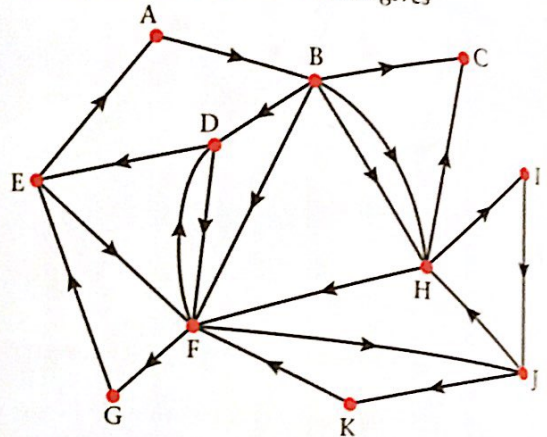
BF + DH = 10 + 26 = 36

BH + DF = 12 + 16 = 28 ← least weight

The shortest route DH is DBH.

Repeat BH and DF.

Adding these arcs to the network gives



A possible route is:

A - B - H - C - B - H - I - J - H - F - J - K - F -
B - D - F - D - E - F - G - E - A.

c length of route = 249 + 28 = 277

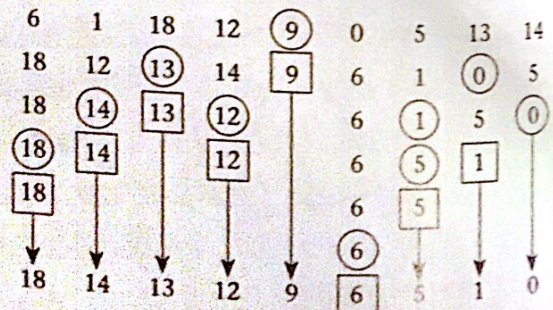
- d i** We will still have to repeat the shortest path between a pair of the odd nodes. We will choose the pair that requires the shortest path. The shortest path of the six is BF (10). We will use D and H as the start and finish nodes.

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- e** Each edge, having two ends, contributes two to the sum of valencies for the network. Therefore the sum = 2 × number of edges. The sum is even so any odd valencies must occur in pairs.

Review exercise 1

- 1** For example,



Datchet (18), Wraybury (14), Staines (13) Feltham (12), Halliford (9) Ashford (6), Poyle (5), Colnbrooke (1), Laleham (0)

- 2 a** All arcs are to be traversed twice, this is, in effect, repeating each arc. So all valencies are even
b E.g. A - B - D - G - F - G - D - C - E - A - E - C - A - F - E - F - B - F - A - B - D - C - A (all correct routes will have 23 letters in their name)
 length = 2 × 6 = 12 km