**Assignment-6**

#Q1:

Formulation:

Where, u1, u2, v1 and v2 are the weighed output and input factors resp.

Hence objective function for each DMUs is given as

DMU 1:

Max, z= 14000 u1 + 3500 u2

Subject to constraints,

14000 u1 + 3500 u2 – 150 v1 – 0.2 v2 <= 0

14000 u1 + 21000 u2 – 400 v1 – 0.7 v2 <= 0

42000 u1 + 10500 u2 – 320 v1 – 1.2 v2 <= 0

28000 u1 + 42000 u2 – 520 v1 – 2.0 v2 <= 0

19000 u1 + 25000 u2 – 350 v1 – 1.2 v2 <= 0

14000 u1 + 15000 u2 – 320 v1 – 0.7 v2 <= 0

150 v1 + 0.2 v2 = 1

v1, v2, u1, u2, >=0

DMU 2:

Max, z= 14000 u1 + 21000 u2

Subject to constraints,

14000 u1 + 3500 u2 – 150 v1 – 0.2 v2 <= 0

14000 u1 + 21000 u2 – 400 v1 – 0.7 v2 <= 0

42000 u1 + 10500 u2 – 320 v1 – 1.2 v2 <= 0

28000 u1 + 42000 u2 – 520 v1 – 2.0 v2 <= 0

19000 u1 + 25000 u2 – 350 v1 – 1.2 v2 <= 0

14000 u1 + 15000 u2 – 320 v1 – 0.7 v2 <= 0

400 v1 + 0.7 v2 = 1

v1, v2, u1, u2, >=0

DMU 3:

Max, z= 42000 u1 + 10500 u2

Subject to constraints,

14000 u1 + 3500 u2 – 150 v1 – 0.2 v2 <= 0

14000 u1 + 21000 u2 – 400 v1 – 0.7 v2 <= 0

42000 u1 + 10500 u2 – 320 v1 – 1.2 v2 <= 0

28000 u1 + 42000 u2 – 520 v1 – 2.0 v2 <= 0

19000 u1 + 25000 u2 – 350 v1 – 1.2 v2 <= 0

14000 u1 + 15000 u2 – 320 v1 – 0.7 v2 <= 0

320 v1 + 1.2 v2 = 1

v1, v2, u1, u2, >=0

DMU 4:

Max, z= 28000 u1 + 42000 u2

Subject to constraints,

14000 u1 + 3500 u2 – 150 v1 – 0.2 v2 <= 0

14000 u1 + 21000 u2 – 400 v1 – 0.7 v2 <= 0

42000 u1 + 10500 u2 – 320 v1 – 1.2 v2 <= 0

28000 u1 + 42000 u2 – 520 v1 – 2.0 v2 <= 0

19000 u1 + 25000 u2 – 350 v1 – 1.2 v2 <= 0

14000 u1 + 15000 u2 – 320 v1 – 0.7 v2 <= 0

520 v1 + 2.0 v2 = 1

v1, v2, u1, u2, >=0

DMU 5:

Max, z= 19000 u1 + 25000 u2

Subject to constraints,

14000 u1 + 3500 u2 – 150 v1 – 0.2 v2 <= 0

14000 u1 + 21000 u2 – 400 v1 – 0.7 v2 <= 0

42000 u1 + 10500 u2 – 320 v1 – 1.2 v2 <= 0

28000 u1 + 42000 u2 – 520 v1 – 2.0 v2 <= 0

19000 u1 + 25000 u2 – 350 v1 – 1.2 v2 <= 0

14000 u1 + 15000 u2 – 320 v1 – 0.7 v2 <= 0

350 v1 + 1.2 v2 = 1

v1, v2, u1, u2, >=0

DMU 6:

Max, z= 14000 u1 + 15000 u2

Subject to constraints,

14000 u1 + 3500 u2 – 150 v1 – 0.2 v2 <= 0

14000 u1 + 21000 u2 – 400 v1 – 0.7 v2 <= 0

42000 u1 + 10500 u2 – 320 v1 – 1.2 v2 <= 0

28000 u1 + 42000 u2 – 520 v1 – 2.0 v2 <= 0

19000 u1 + 25000 u2 – 350 v1 – 1.2 v2 <= 0

14000 u1 + 15000 u2 – 320 v1 – 0.7 v2 <= 0

320 v1 + 0.7 v2 = 1

v1, v2, u1, u2, >=0