

Problem situation:

An airline operates in 50 principal cities in the United States of America and wishes to schedule its flights efficiently to maximize passenger satisfaction and minimize operating costs. You have information about the cities where the airline operates and the availability of direct flights between them.

The objective is to find the optimal flight schedule that meets the following requirements.

- Connectivity: Ensure that all cities are accessible by direct flights or connections between cities. Unnecessary or excessive connections should be avoided to minimize flight time and costs.
- Shorter routes: Find the shortest routes between city pairs, considering distance or flight time as metrics. This will enable faster and more efficient routes to be offered to passengers.
- Optimization of scales: In case stopovers or connections are necessary to reach a destination, find the combination of flights that minimizes the total travel time or the associated cost.

The goal is to achieve a flight schedule that ensures connectivity between all cities, offers shorter routes and optimizes stopovers when necessary, taking into account passenger satisfaction and the airline's operational efficiency.

Information of cities: City 1 - City 2 - Flight time in minutes - Flight cost

New York City - Los Angeles - 360 - \$500	San Antonio - Dallas - 90 - \$250
New York City - Chicago - 120 - \$300	San Diego - Dallas - 260 - \$410
Los Angeles - Chicago - 240 - \$400	San Diego - San Jose - 200 - \$375
Los Angeles - Houston - 180 - \$350	Dallas - San Jose - 250 - \$400
Chicago - Houston - 180 - \$350	Dallas - Austin - 70 - \$225
Chicago - Phoenix - 240 - \$400	San Jose - Austin - 240 - \$400
Houston - Phoenix - 200 - \$375	San Jose - Jacksonville - 300 - \$450
Houston - Philadelphia - 210 - \$380	Austin - Jacksonville - 280 - \$425
Phoenix - Philadelphia - 300 - \$450	Austin - San Francisco - 310 - \$460
Phoenix - San Antonio - 150 - \$325	Jacksonville - San Francisco - 350 - \$500
Philadelphia - San Antonio - 280 - \$425	Jacksonville - Columbus - 180 - \$350
Philadelphia - San Diego - 320 - \$475	San Francisco - Columbus - 240 - \$400
San Antonio - San Diego - 220 - \$390	San Francisco - Indianapolis - 280 - \$425

Columbus - Indianapolis - 150 - \$325
Columbus - Fort Worth - 180 - \$350
Indianapolis - Fort Worth - 210 - \$380
Indianapolis - Charlotte - 220 - \$390
Fort Worth - Charlotte - 250 - \$400
Fort Worth - Seattle - 320 - \$475
Charlotte - Seattle - 300 - \$450
Charlotte - Denver - 250 - \$400
Seattle - Denver - 180 - \$350
Seattle - Washington, D.C. - 280 - \$425
Denver - Washington, D.C. - 320 - \$475
Denver - Boston - 330 - \$480
Washington, D.C. - Boston - 150 - \$325
Washington, D.C. - El Paso - 360 - \$500
Boston - El Paso - 280 - \$425
Boston - Detroit - 160 - \$335
El Paso - Detroit - 330 - \$480
El Paso - Nashville - 260 - \$410
Detroit - Nashville - 180 - \$350
Detroit - Portland - 360 - \$500
Nashville - Portland - 280 - \$425
Nashville - Memphis - 70 - \$225
Portland - Memphis - 220 - \$390
Portland - Oklahoma City - 240 - \$400
Memphis - Oklahoma City - 180 - \$350
Memphis - Las Vegas - 280 - \$425
Oklahoma City - Las Vegas - 240 - \$400

Oklahoma City - Miami - 320 - \$475
Las Vegas - Miami - 360 - \$500
Las Vegas - Atlanta - 310 - \$460
Miami - Atlanta - 280 - \$425
Miami - Minneapolis - 330 - \$480
Atlanta - Minneapolis - 240 - \$400
Atlanta - Oakland - 360 - \$500
Minneapolis - Oakland - 320 - \$475
Minneapolis - Kansas City - 150 - \$325
Oakland - Kansas City - 210 - \$380
Oakland - New Orleans - 260 - \$410
Kansas City - New Orleans - 220 - \$390
Kansas City - Sacramento - 240 - \$400
New Orleans - Sacramento - 280 - \$425
New Orleans - Honolulu - 480 - \$700
Sacramento - Honolulu - 360 - \$500
Sacramento - St. Louis - 330 - \$480
Honolulu - St. Louis - 420 - \$600
Honolulu - Tampa - 360 - \$500
St. Louis - Tampa - 300 - \$450
St. Louis - Pittsburgh - 210 - \$380
Tampa - Pittsburgh - 240 - \$400
Tampa - Cincinnati - 220 - \$390
Pittsburgh - Cincinnati - 150 - \$325
Pittsburgh - Austin - 310 - \$460
Cincinnati - Austin - 280 - \$425
Cincinnati - Raleigh - 260 - \$410

Austin - Raleigh - 240 - \$400
Austin - Cleveland - 280 - \$425
Raleigh - Cleveland - 180 - \$350
Raleigh - San Francisco - 360 - \$500
Cleveland - San Francisco - 320 - \$475
Cleveland - Orlando - 310 - \$460
San Francisco - Orlando - 360 - \$500
San Francisco - Indianapolis - 280 - \$425
Orlando - Indianapolis - 240 - \$400
Orlando - Houston - 260 - \$410
Indianapolis - Houston - 220 - \$390
Indianapolis - Seattle - 330 - \$480
Houston - Seattle - 360 - \$500
Houston - Philadelphia - 210 - \$380
Seattle - Philadelphia - 280 - \$425
Seattle - Charlotte - 240 - \$400
Philadelphia - Charlotte - 180 - \$350
Philadelphia - San Diego - 320 - \$475
Charlotte - San Diego - 360 - \$500
Charlotte - Denver - 250 - \$400