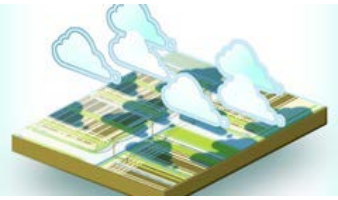


Quick Questions 15

Announcements

Syllabus

Orientation (Mandatory; Start Here)

AWS Credit Opt-in Consent Form

Responses to Commonly Asked Questions

TASKS

Project Overview ←

Task 1

Task 1 Queries

Task 1 Example Solutions

Task 2

Task 2 Queries

Task 2 Example Solutions

COURSE COMMUNITY

All Forums

Know Your Classmates

Help Center

Task 1 Example Solutions

Help Center

Table of Contents

Task 1 Queries

Below, you will find the set of individual queries for Questions 2.1-2.4 and 3.2 that must be included in your submission for Task 1.

Questions 2.1 and 2.2

Provide the results using the following airport codes.

- CMI (University of Illinois Willard Airport)
- BWI (Baltimore-Washington International Airport)
- MIA (Miami International Airport)
- LAX (Los Angeles International Airport
- IAH (George Bush Intercontinental Airport)
- SFO (San Francisco International Airport)

Questions 2.3 and 2.4

Provide the results using the following routes.

- CMI → ORD
- IND → CMH
- DFW → IAH
- LAX → SFO
- JFK → LAX
- ATL → PHX

Question 3.2

Provide the results using the following routes and start dates. Dates are in dd/mm/yyyy format.

- CMI → ORD → LAX, 04/03/2008
- JAX → DFW → CRP, 09/09/2008
- SLC → BFL → LAX, 01/04/2008
- LAX → SFO → PHX, 12/07/2008
- DFW → ORD → DFW, 10/06/2008
- LAX → ORD → JFK: 01/01/2008

Task 1 Example Solutions

These solutions were created with “on-time performance” calculated using the delay in minutes (including negative delays). Other solutions are possible depending on your definition of this metric. Please use these solutions as a general example.

Question 1.1

Airport: Number of flights in/out

Note: two of the following airports (ORD and LAX) have a single flight of the form X → X which has been double-counted in the result below.

1. ORD: 12449354
2. ATL: 11540422
3. DFW: 10799303
4. LAX: 7723596
5. PHX: 6585534
6. DEN: 6273787
7. DTW: 5636622
8. IAH: 5480734
9. MSP: 5199213
10. SFO: 5171023

Question 1.2

Airline: Average delay in minutes

1. HA: -1.01
2. AQ: 1.16
3. PS: 1.45
4. ML (1): 4.75
5. PA (1): 5.32
6. F9: 5.47
7. NW: 5.56
8. WN: 5.56
9. OO: 5.74
10. 9E: 5.87

Question 1.3

Weekday: Average delay in minutes

1. Saturday: 4.30
2. Tuesday: 5.99
3. Sunday: 6.61
4. Monday: 6.72
5. Wednesday: 7.20
6. Thursday: 9.09
7. Friday: 9.72

Question 2.1

Airport: (Airline, Average delay in minutes)

CMI

- (OH, 0.61)
- (US, 2.03)
- (TW, 4.12)
- (PI, 4.46)
- (DH, 6.03)
- (EV, 6.67)
- (MQ, 8.02)

BWI

- (F9, 0.76)
- (PA (1), 4.76)
- (CO, 5.18)
- (YV, 5.50)
- (NW, 5.71)
- (AA, 6.00)
- (9E, 7.24)
- (US, 7.49)
- (DL, 7.68)
- (UA, 7.74)

MIA

- (9E, -3.0)
- (EV, 1.20)
- (TZ, 1.78)
- (XE, 1.87)
- (PA (1), 4.20)
- (NW, 4.50)
- (US, 6.09)
- (UA, 6.87)
- (ML (1), 7.50)
- (FL, 8.57)

LAX

- (MQ, 2.41)
- (OO, 4.22)
- (FL, 4.73)
- (TZ, 4.76)
- (PS, 4.86)
- (NW, 5.12)
- (F9, 5.73)
- (HA, 5.81)
- (YV, 6.02)
- (US, 6.75)

IAH

- (NW, 3.56)
- (PA (1), 3.98)
- (PI, 3.99)
- (US, 5.06)
- (F9, 5.55)
- (AA, 5.70)
- (TW, 6.05)
- (WN, 6.23)
- (OO, 6.59)
- (MQ, 6.71)

SFO

- (TZ, 3.95)
- (MQ, 4.85)
- (F9, 5.16)
- (PA (1), 5.29)
- (NW, 5.76)
- (PS, 6.30)
- (DL, 6.56)
- (CO, 7.08)
- (US, 7.53)
- (TW, 7.79)

Question 2.2

Airport: (Airport, Average delay in minutes)

CMI

- (ABI, -7.0)
- (PIT, 1.10)
- (CVG, 1.89)
- (DAY, 3.12)
- (STL, 3.98)
- (PIA, 4.59)
- (DFW, 5.94)
- (ATL, 6.67)
- (ORD, 8.19)

BWI

- (SAV, -7.0)
- (MLB, 1.16)
- (DAB, 1.47)
- (SRQ, 1.59)
- (IAD, 1.79)
- (UCA, 3.65)
- (CHO, 3.74)
- (GSP, 4.20)
- (SJU, 4.44)
- (OAJ, 4.47)

MIA

- (SHV, 0.0)
- (BUF, 1.0)
- (SAN, 1.71)
- (SLC, 2.5)
- (HOU, 2.91)
- (ISP, 3.65)
- (MEM, 3.75)
- (PSE, 3.98)
- (TLH, 4.26)
- (MCI, 4.61)

LAX

- (SDF, -16.0)
- (IDA, -7.0),
- DRO, -6.0)
- (RSW, -3.0)
- (LAX, -2.0)

- (BZN, -0.73)
- (MAF, 0.0)
- (PIH, 0.0)
- (IYK, 1.27)
- (MFE, 1.38)

IAH

- (MSN, -2.0)
- (AGS, -0.62)
- (MLI, -0.5)
- (EFD, 1.89)
- (HOU, 2.17)
- (JAC, 2.57)
- (MTJ, 2.95)
- (RNO, 3.22)
- (BPT, 3.60)
- (VCT, 3.61)

SFO

- (SDF, -10.0)
- (MSO, -4.0)
- (PIH, -3.0)
- (LGA, -1.76)
- (PIE, -1.34)
- (OAK, -0.81)
- (FAR, 0.0)
- (BNA, 2.43)
- (MEM, 3.30)
- (SCK, 4.0)

Question 2.3

X → Y: (Airline, Average delay in minutes)

- **CMI → ORD**

1. (MQ, 10.14)

IND → CMH

1. (CO, -2.55)
2. (AA, 5.5)
3. (HP, 5.70)
4. (NW, 5.76)
5. (US, 6.88)
6. (DL, 10.69)
7. (EA, 10.81)

DFW → IAH

1. PA (1), -1.60)
2. (EV, 5.09)
3. (UA, 5.41)
4. (CO, 6.49)
5. (OO, 7.56)
6. (XE, 8.09)
7. (AA, 8.38)
8. (DL, 8.60)
9. (MQ, 9.10)

LAX → SFO

1. (TZ, -7.62)

2. (PS, -2.15)
3. (F9, -2.03)
4. (EV, 6.96)
5. (AA, 7.39)
6. (MQ, 7.81)
7. (US, 7.96)
8. (WN, 8.79)
9. (CO, 9.35)
10. (NW, 9.85)

JFK → LAX

1. (UA, 3.31)
2. (HP, 6.68)
3. (AA, 6.90)
4. (DL, 7.93)
5. (PA
6. (1), 11.02)
7. (TW, 11.70)

ATL → PHX

1. (FL, 4.55)
2. (US, 6.29)
3. (HP, 8.48)
4. (EA, 8.95)
5. (DL, 9.81)

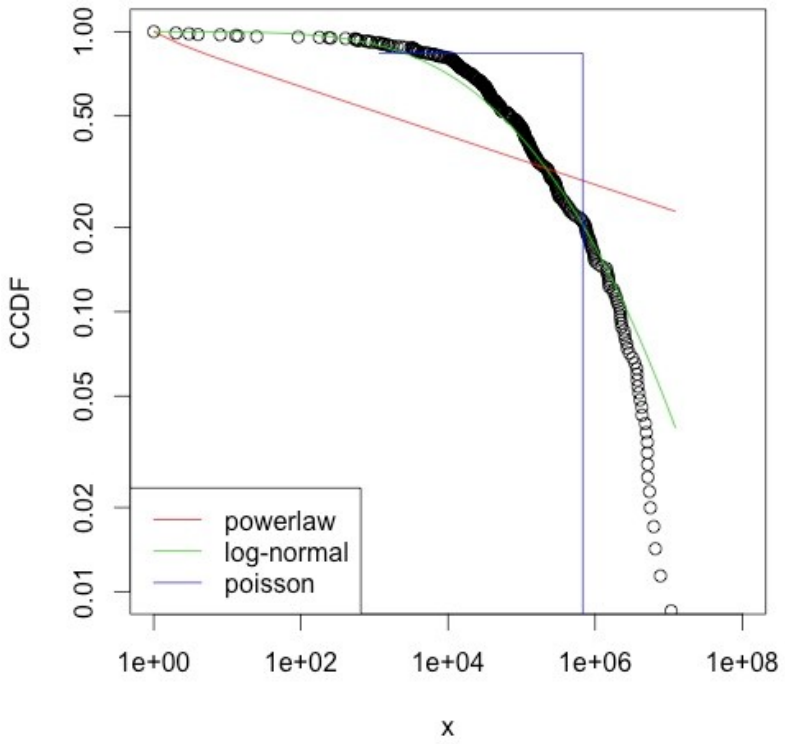
Question 2.4

X → Y: Average delay in minutes

- CMI → ORD: 10.14
- IND → CMH: 2.90
- DFW → IAH: 7.65
- LAX → SFO: 9.59
- JFK → LAX: 6.64
- ATL → PHX: 9.02

Question 3.1

Below is the log-log CCDF of the airport popularities, along with fitted models from power-law (Zipfian), log-normal, and Poisson distributions. Note that the CCDF illustrates the fraction of airports with popularity above a given value. As you can see, the overall shape of the CCDF does not appear to follow a straight line, and thus we can reasonably reject the hypothesis that the data was drawn from a power-law (Zipfian) distribution simply using visual inspection. Rather, we can see that out of the three fitted distributions, log-normal seems the best at modelling our data.



For a more concrete result, we can perform a Kolmogorov-Smirnov test on the fitted power-law distribution model (e.g., using R's power.law.fit function from the "poweRlaw" package - see this example). This results in a K-S statistic of 0.13 and a p-value of 0.00035. Since the p-value is less than 0.05, a reasonable significance level, we can infer that the fitted power-law distribution poorly models our data.

Question 3.2

Delays are in minutes, date is dd/MM/yyyy

- **CMI → ORD → LAX, 04/03/2008:**
  - Total arrival delay: -38.0
  - First leg:
    - Origin: CMI
    - Destination: ORD
    - Airline/Flight Number: MQ 4278
    - Sched Depart: 7:10 04/03/2008
    - Arrival delay: -14.0
  - Second leg:
    - Origin: ORD
    - Destination: LAX
    - Airline/Flight Number: AA 607
    - Sched Depart: 19:50 06/03/2008
    - Arrival delay: -24.0
- **JAX → DFW → CRP, 09/09/2008:**
  - Total arrival delay: -6.0
  - First leg:
    - Origin: JAX
    - Destination: DFW
    - Airline/Flight Number: AA 845
    - Sched Depart: 7:25 09/09/2008

        - Arrival delay: 1.0
    - Second leg:
        - Origin: DFW
        - Destination: CRP
        - Airline/Flight Number: MQ 3627
        - Sched Depart: 16:45 11/09/2008
        - Arrival delay: -7.0
- **SLC → BFL → LAX, 01/04/2008:**
    - Total arrival delay: 18.0
    - First leg:
        - Origin: SLC
        - Destination: BFL
        - Airline/Flight Number: OO 3755
        - Sched Depart: 11:00 01/04/2008
        - Arrival delay: 12.0
    - Second leg:
        - Origin: BFL
        - Destination: LAX
        - Airline/Flight Number: OO 5429
        - Sched Depart: 14:55 03/04/2008
        - Arrival delay: 6.0
- **LAX → SFO → PHX, 12/07/2008:**
    - Total arrival delay: -32.0
    - First leg:
        - Origin: LAX
        - Destination: SFO
        - Airline/Flight Number: WN 3534
        - Sched Depart: 6:50 12/07/2008
        - Arrival delay: -13.0
    - Second leg:
        - Origin: SFO
        - Destination: PHX
        - Airline/Flight Number: US 412
        - Sched Depart: 19:25 14/07/2008
        - Arrival delay: -19.0
- **DFW → ORD → DFW, 10/06/2008:**
    - Total arrival delay: -31.0
    - First leg:
        - Origin: DFW
        - Destination: ORD
        - Airline/Flight Number: UA 1104
        - Sched Depart: 7:00 10/06/2008
        - Arrival delay: -21.0
    - Second leg:
        - Origin: ORD
        - Destination: DFW
        - Airline/Flight Number: AA 2341
        - Sched Depart: 16:45 12/06/2008
        - Arrival delay: -10.0
- **LAX → ORD → JFK: 01/01/2008:**
    - Total arrival delay: -6.0
    - First leg:
        - Origin: LAX
        - Destination: ORD
        - Airline/Flight Number: UA 944
        - Sched Depart: 7:05 01/01/2008

    - Arrival delay: 1.0
  - Second leg:
    - Origin: ORD
    - Destination: JFK
    - Airline/Flight Number: B6 918
    - Sched Depart: 19:00 03/01/2008
    - Arrival delay: -7.0

Created Wed 10 Feb 2016 3:02 AM MSK

Last Modified Thu 11 Feb 2016 1:17 AM MSK