1.a
Data house is a centra repository of information that can be analyzed to make more informed decisions, it is a subject-oriented, integrated, time-variant, and nonvolatile collection of data in support of management's decision-making process.
3 data warehouse methods: Enterprise warehouse, Data mart, and Virtual warehouse.

1.b
1.Star schema: A fact table in the middle connected to a set of dimension tables.

2.Snowflake schema: A refinement of star schema where some dimensional hierarchy is normalized into a set of smaller dimension tables, forming a shape like snowflake

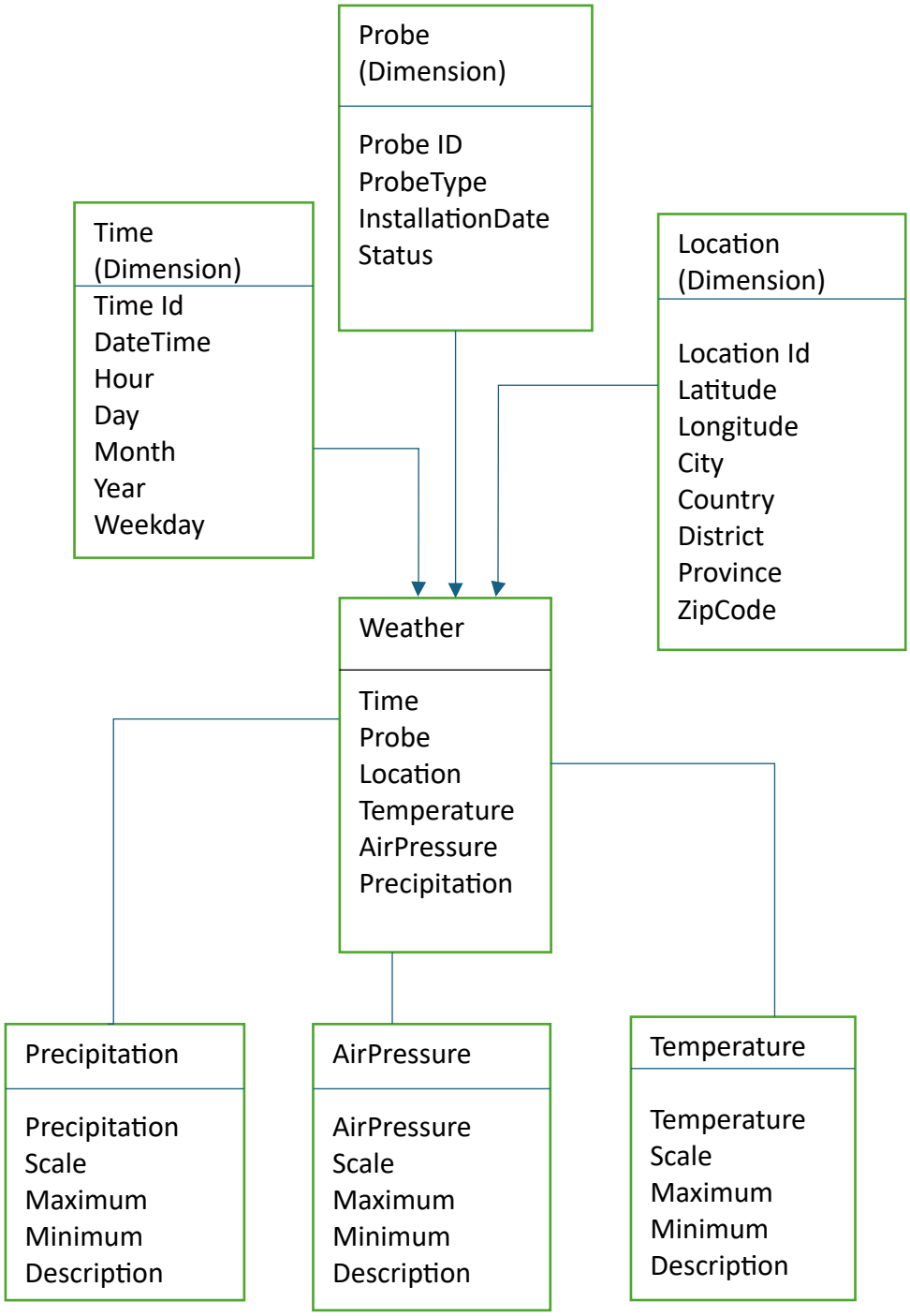
3.Fact constellations: Multiple fact tables share dimension tables, viewed as a collection of stars, therefore called galaxy schema or fact constellation

2.
The code for it:
CREATE BITMAP INDEX idx_cat ON table(Cat);
CREATE BITMAP INDEX idx_hamster ON table(Hamster);
CREATE BITMAP INDEX idx_dog ON table(Dog);

Animal Type	Bitmap
Cat	10001
Hamster	01000
Dog	00110

Cat: 10001
C1: 1 (Cat)
C2: 0 (Not Cat)
C3: 0 (Not Cat)
C4: 0 (Not Cat)
C5: 1 (Cat)
Hamster: 01000
C1: 0 (Not Hamster)
C2: 1 (Hamster)
C3: 0 (Not Hamster)
C4: 0 (Not Hamster)
C5: 0 (Not Hamster)
Dog: 00110
C1: 0 (Not Dog)
C2: 0 (Not Dog)
C3: 1 (Dog)
C4: 1 (Dog)
C5: 0 (Not Dog)

3.


Probe
(Dimension)
Probe ID
ProbeType
InstallationDate
Status
Time
(Dimension)
Time Id
DateTime
Hour
Day
Month
Year
Weekday
Location
(Dimension)
Location Id
Latitude
Longitude
City
Country
District
Province
ZipCode
Weather
Time
Probe
Location
Temperature
AirPressure
Precipitation
Precipitation
Precipitation
Scale
Maximum
Minimum
Description
AirPressure
AirPressure
Scale
Maximum
Minimum
Description
Temperature
Temperature
Scale
Maximum
Minimum
Description

4. to calculate cuboids we use: T = $\prod_{i=1}^{n}(L_i + 1)$

4.a
T = $\prod_{i=1}^{10}(1_1 + 1)$ = 2^{10} = 1024 cuboids

4.b
T = $\prod_{i=1}^{5}(4_1 + 1)$ = 5^5 = 3125 cuboids