Department of Computer Engineering

Faculty of Engineering Chulalongkorn University

Course ID: 2190436 Course Name: Data Warehousing

Second Semester, Midterm Examination, Date: Thu, May 6, 2021 Part 1 (1.30 hours)

Part1: Intermediate Concepts in Data Warehousing (15 points – 1.30 hours)

A Major Cineplex Group Public Co. Ltd. is the largest operator of movie theaters in Thailand. In the online booking process, customers must register before buying a ticket (Figure 1) from the Major Cineplex website, where **MemberID** is assigned to each member. Figure 2 is a star schema of the movie booking process. A granularity refers to **each seat** of each member's ticket booking (**BookingID**). Note that promotion is an important information for analysis composing of PromotionID, PromotionName, PromotionDescription, and DiscountRate. Table 1 is an example of the BI report generated from the given DW showing an analysis on the movie "La La Land".

Figure 1. An example of movie ticket.

Table 1. The number of total seats along with income (THB) of the movie "La La Land" of all cinema branches in **Bangkok during the first week**.

Schedule		Seat Type (#seats)				Total Revenue (THB)
		Regular	Honeymoon	VIP	Total	
Weekdays	Morning	377	464	139	**980**	**344,400.00**
	Afternoon	346	373	210	**929**	**344,400.00**
	Evening	427	400	126	**953**	**321,000.00**

Weekends	Morning	280	416	240	**936**	**366,400.00**
	Afternoon	485	424	344	**1,253**	**473,000.00**
	Evening	226	433	428	**1,087**	**475,200.00**
Total		**2,141**	**2,510**	**1,487**	**6,138**	**2,324,400.00**

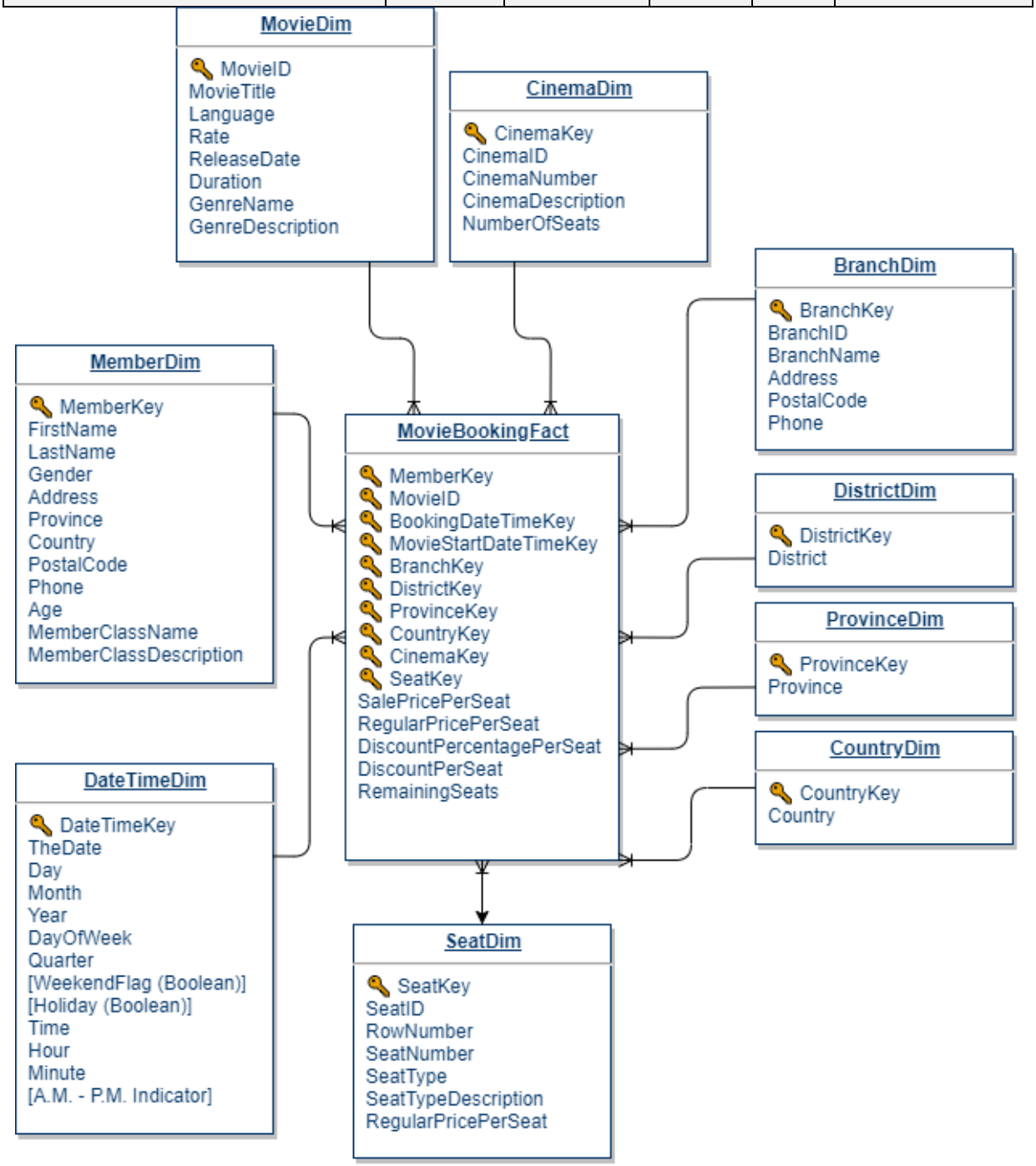

Figure 2. A star schema of the online movie booking process called “MovieBookingFact”.

Note that SalePricePerSeat = (RegularPricePerSeat - DiscountPerSeat)

Answer the questions below from the given star schema in Figure 2.

1. Specify a type of measures (additive, non-additive, or semi-additive) (1 point)
2. Identify the multi-role-playing dimension (with explanation) (1 point)
3. Propose **8 updates** to improve or correct mistakes the design in Figure 2. Please also **draw a diagram** to show your update design (5 points)
    a. Remark1: The designed DW must be able to answer report in Table 1.
    b. Remark2: Promotion is an important information.
    c. Remark3: The same update technique can be counted **ONLY ONCE**. For example, if you remove two attributes from the fact table (not relate the problem), this can be counted as only one update, **NOT** two updates.
4. Write SQL statement to show "overall revenue" of each "SeatType," which can be computed from the measure "SalePricePerSeat", of all movies in 2016 (1 point)
5. Explain how to improve DateDim to avoid unnecessary joining it to the fact table (1 point)
6. Write two analyses that can be queried by CEO from your DW design (1 point)

Also, a **monthly** revenue report (Figure 3) is often used by Chief Executive Officer (CEO) to track the status of the company; thus, it must be generated **very quickly**. Please answer the following questions:

Movie	Branch (Total Revenue (THB))				Total
	Bang Kapi	Bang Na	Pinklao	Ratchayothin	
Extraction	991,422.00	326,400.00	445,737.00	808,037.00	**2,571,596.00**
Pride and Prejudice and Zombies	820,292.00	340,875.00	422,688.00	212,458.00	**1,796,313.00**
The Revenant	613,638.00	968,695.00	517,619.00	640,142.00	**2,740,094.00**
The Monkey King 2	452,739.00	975,037.00	362,261.00	551,513.00	**2,341,550.00**
Deadpool	228,257.00	784,170.00	304,415.00	988,718.00	**2,305,560.00**
Gods of Egypt	427,565.00	415,010.00	608,682.00	208,068.00	**1,659,325.00**
Total	**3,533,913.00**	**3,810,187.00**	**2,661,402.00**	**3,408,936.00**	**13,414,438.00**

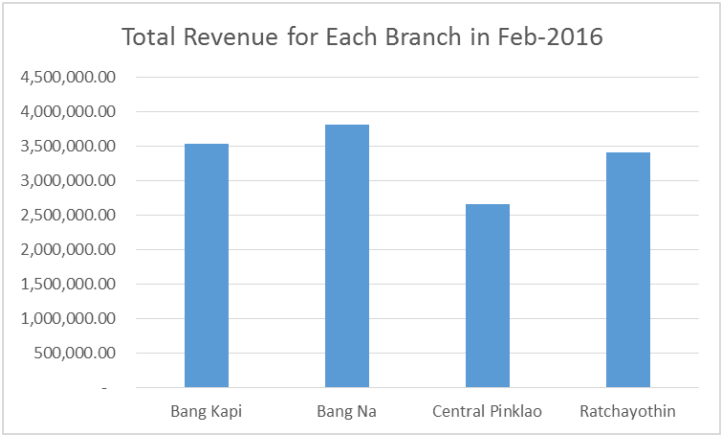

Figure 3. A monthly summary report of the overall revenue (THB) for **each movie per cinema branch located in Bangkok in Feb-2016**

7. Design and **draw** the aggregated fact table with its corresponding dimensions (4 points)
8. Compare the number of maximum possible cases (rows) between the base fact table and the aggregated fact table. Suppose collecting data for 10 years, there are about 1,000 **daily** bookings per branch in average, and there are 100 total branches. Note that there are 10 new movies showing every month in average. (1 point)