ADVANCED DATABASE PROJECT

THE CASINO PROJECT

After reading the verbal description of this project you are to do the following using the provided forms. You must use the forms given (or copies of those forms) and not create your own (unless they are identical). **YOU MUST ALSO INCLUDE AS PAGE 1 OF YOUR PROJECT THE COVER SHEET SHOWING THE GRADING- PAGE 1 OF THIS HANDOUT.**

A) Logical Design

1. Identify and name each entity.
2. For each entity, identify and name each attribute.
3. Domain for each attribute.
4. Identify the primary key for each entity.
5. What are the relationships between entities? Describe it in 1 sentence or phrase.
6. What is the name of each relationship?
7. What is the mapping between relationships (1-1, 1-m, m-n)?
8. Identify the relationship data, if any.
9. Identify the transactions.
10. Identify the access of each transaction (update/read).
11. What is the frequency (# of times per day, per week, per month).
12. Identify the entities and relationships in each transaction.
13. For each transaction, is it batch or on-line.
14. Describe each transaction in one sentence or phrase?

THE CASINO PROJECT

Hi, I'm Peter Flynn and I own this casino. I call it the MONTE FLYNNO but between us, let's just call it the Casino! Business is great. People come from all over to lose money. I make so much money, I just don't know how to spend it all. I could gamble but I'm not stupid. Gambling is for the foolish. I just hope my customers continue to be foolish. Ha, ha, ha. I'm making enough money but I need to control spending and manage the casino more efficiently. That's where you come in. I want you to design a database system for me. I spoke to Lowy and he gave me your name. That jerk lost $100,000 at the blackjack table. On his FDU salary it would take 129 years for him to pay me off. So he volunteered you to develop this system. If you do a good job, he will then owe me nothing. But if you do a bad job, he'll still owe me $100,000 and he said he would flunk you in the course. GET IT? Now, I don't have time to waste with you, so I'll let you speak to my managers. First, here is Rocco, he'll take you to the different managers. Rocco doesn't speak much but he's quick and that bulge in his jacket isn't a salami if you know what I mean, so no funny business from you. Rocco, go see Helen Slotsky first.

HELEN SLOTSKY

Hi, I'm Helen Slotsky. It's a good name for someone who works in the casino, don't you think? I'm in charge of Human Services. That means I have to keep track of our employees. We have over 3,000 employees who work in the casino. Every week we fire 100 employees and hire 100 new ones. Sometimes we catch them stealing or taking drugs. It doesn't matter what we just fire them. Just like Donald Trump on the Apprentice. YOU'RE FIRED. They never put up much of a fuss since if they do then Rocco talks with them in the back alley- if you know what I mean. There is no problem hiring new people because we pay very well. Everyone in town knows that Mr. Flynn pays top dollar.

When we hire the new employees we must collect information like their social security number and their real name. So many people try to give us phony names but we do everything above board (except for Rocco) like pay taxes. So we need their real names and

addresses, phone numbers and social security number. We always want to know the first salary we gave them when we hired them and the current salary. It's also good to know how old they are. Now, I know we can't discriminate against older workers but let's face it, people come to the casino to see young and sexy people. Would you rather have a 25-year-old or a 90-year-old person bringing you a drink? Well, whatever you prefer, we don't discriminate. We have plenty of jobs for everyone. When we hire someone, we want to remember the date of hire and for what position. If we hire someone as a blackjack dealer he or she may or may not have experience. That's where the starting salary comes in. The more experience, the higher the salary. Also, the position influences the salary. Roulette dealers are harder to find than blackjack dealers. And craps dealers are harder to find than blackjack dealers. Once we hire someone, we can always train him or her for a different job. The only thing is we need to keep track of every employee's progress. Every raise and promotion must be dated and starting and ending salary information kept. Every week, 20% of our employees get raises with or without promotions. We treat our workers really good. Remember that a happy worker doesn't talk to the police!

The only person who doesn't have a boss is Mr. Flynn. However, everyone else has a boss. That boss is always an employee in the company. No consultants for us. Besides we want to make sure the police don't get someone inside the business. But, that's why we have Rocco- you know what I mean?

It's time for you to talk to Captain Happy. His real name is Mortimer Happy but he doesn't like Mortimer and wants to be called Captain. He's the manager in charge of Customer Relations. Rocco, go to Captain Happy. Good Luck.

CAPTAIN HAPPY

Hi, I'm Captain Happy. Every hour with me is a happy hour. I think I'll tell you all about our customers and the wonderful things we do for them. Now, some people come to the casino and play and lose and go home and we never find out who they are. But the smart losers (there are no winners you know) come and register and get a casino card. It's like a credit card, which they put into the slot machine. The more they lose the more points they get. Once

they have accumulated sufficient points, then we give them free meals in our restaurant and if they have enough points, we give them free rooms. The really big losers get free limousine rides from their home to the casino. Why do we do this? To make the losers feel that losing money is not so bad since we get all this free stuff. Ha, we make so much money fooling these people.

Anyway, every customer who registers, we keep his or her name, address, social security number, phone, age, and gender. We give each customer a unique customer number. Now, that's not the same as their casino card number. Each casino card is a different number and it's never the same as the customer number. Why have different numbers? Who knows? That's the way we do it. Every customer has a unique customer number and a unique casino card number. I suppose the casino card number could change somehow but not the customer number. We have about 1.5 million customers. Every day, we get 3,000 new customers. We never get rid of a customer. If a customer hasn't come back in awhile, we are patient and still expect him to return. Customers can die but we never find out. I have no idea how many of our customers are dead. Maybe, I should ask Rocco. Ha, Ha, Ha.

Customers change their address and notify us because they want to get the mail from us. I would say that we get about 10,000 address changes a month. Every time a customer gambles he earns points. When a customer plays a slot machine and puts his casino card in the slot machine, we know who it is and we start recording points. When the customer leaves and pulls out his card, we add the points to his total. It works the same way for blackjack, roulette and craps. We also want to keep track of how much money each customer gambles with and add that to his total gambling amount, which we keep since he became known to us as a gambler.

On average, every day we have about 50,000 customers in the casino. Each customer plays on average on three tables and five slot machines. Usually, each type of table gets the same number of customers.

A customer with a lot of points earns comps. Comps are offers from the casino to the customer for free rooms or meals. We usually send out offers for comps in the mail. Any customer with a lot of points say 10,000 gets an offer. We send out the offers every day. Usually we send out these offers to about 10% of our customers. What we do is every day we create an offer and send it out to about 10% of our customers.

In addition, once a month we send a special offer to entice customers who have not been with us for over 6 months. We usually have about 400,000 of these customers. In order not to have too much work at the end of the month, we divide the work up and send out these special offers over 20 days. All we do is read the customer information and see when the customer gambled last and if it was more than 3 months ago, then we send the offer out to those customers. We record when we send the offer out. Each offer has a start date and an expiration date and each offer can be offering one or more comps. The same comps can be found in many offers. We also need to know when the customer called us up to accept the offer and when the customer actually used the offer. When we have a customer gambling, we must record the date he was gambling so we should know when to send these offers out.

Every day, about 40% of the customers call us up on the phone and accept our offers - both regular and special offers. We must remember the date they called. The time they called is not important to us. Of those who accepted the offer, about 80% of them actually use that offer. This is an average per day amount.

There are a lot of different comps. There are meal comps, room comps, prize comps and there are even coupons that can be used for gambling. Since there are so many, we give each comp a number and for the sake of accounting we assign a cost to the casino for each type of comp. We also want to remember how much all the comps cost us that each customer accepts from our offers.

Every time we send out an offer, we give the offer a unique number and then send it out to our customers like I told you before. Each offer can be sent to about 10% of our customers. But not all customers accept the offer. We want to know which customers were offered an

offer and who accepted them. Each offer has a start date and expiration date and we also want to know the date the offer was accepted. When a customer uses an offer, the cost of that offer's comp is added to the balance that we keep for each customer showing how much all the comps cost us that he accepted. All this talking has given me quite a headache. I'm going to the bar and get a drink. It's time Rocco takes you to our manger of slot machines - Ellen Spinnamaker who we usually call by her nickname - the SPINNER.

ELLEN SPINNER

Hi, I'm Spinner. I can tell you all about the casino games. I can tell you which games give you the best odds. I can tell you everything. We have four games in this casino. Some casinos have a lot more but we stick to just 4. We think we make more money that way. Of course we have slot machines. Lots and lots of slots. Some slot machines are 25 cents, some are 50 cents, some are dollar slots, some are $5 slots, some are $10 slots and some are $50 slots. To tell you the truth, all slot machines are the same. It doesn't matter if the machine is a $50 one or 25 cents one. The same images appear in the slot machine's window with the same frequency regardless of the amount of money bet. The amount that you win is always the same multiple of your bet regardless of your bet. For example, you put 25 cents in the slot and spin the wheels and you get 3 diamonds. The payout for 3 diamonds is 10 times your bet. So if you bet 25 cents, you won $2.50 while if the bet was $50 you get $500. The # of units you get is always the same multiple regardless of the bet. In this way, I can take a slot machine and by a simple change I can make it a 25-cent machine or a $25 dollar machine or a $1 dollar machine or anything else.

Now, a customer can put coins in the machine, cash (paper money) or coupons. When you win, the machine can pay out coins or print a coupon. Not all machines have the coupon printers and even those that do can either run out of paper or jam. In that case, a flashing light on the slot machine flashes and an attendant comes and gives the customer the money in cash.

We have over 4,000 slot machines. Each slot machine is really a gold mine. I give each machine a number so I can keep information about it. For instance, I need to know when I

bought it, from whom and for how much. The manufacturer should also be known. Sometimes we buy directly from a manufacturer and sometimes from a middleman. I need to know for which amount of money the machine is currently set and what was the last date of service (maintenance). I also need to know the location of the slot machine. I'll let our head of security, Hugh G. BiCeps explain our grid system to you. All I can tell you is that we need to know the grid number where each machine is located. Every week we replace 200 slot machines with newer ones. The old ones we sell in the gift shop but we don't need to worry about that in this project.

On a regular basis, each slot machine needs to get emptied. That is, we need to get the cash money and inserted coupons out of each slot into my pockets. Just kidding Rocco. Every bill gets put into the safe. We are always so afraid that someone is stealing money that we record all information. We must keep a log of how much money and how much in coupons are removed from each slot. We do this at least 5 times a day for each slot. At the same time, we may add coins to a slot. Of course, we only add coins to a slot that is a 25 cents or 50 cents slot but not to any slot that starts at $1 and up. If we add coins to a slot we need to keep that information too. We also need to add paper for the printer that prints out the tickets. We need to record how much paper was added. We need to keep track of every piece of paper because the paper turns into tickets that we exchange for cash. We also have to record the date and time we added and/or removed. Sometimes the slot malfunctions and pays out too often. The only way to find out is to know how often customers are winning on that machine.

We want to have a list of the types of payouts. For example, three diamonds is one type of payout, three sevens is a different type and there are so many more. Each type is given a type number, a description and the number of units to pay out. The way we use it, is whenever a slot machine comes up with a winner, we get the information electronically since all the machines are connected to our computer. We need to record every occurrence of every type of payout in every slot machine along with the date and time it occurred.

In the rare event that a customer hits a huge jackpot (which is $1000 or more), the payout is by check and we must get the customer to sign some forms for tax purposes. Anyway, that's

all there is to know about the slots. . It's time Rocco takes you to our manger of gambling-John Gameworthy or as we like to call him GAMEY.

JOHN GAMESWORTHY

Hi, I'm Gamey. I keep track of the table games. We only have 3 types but we have a lot of them. We have blackjack, roulette and craps. We have the tables all over so we need to number each table to keep track of them. We also have to know where the tables are located so we state which grid each table is in. Our head of security, Hugh G. BiCeps, will explain the grids to you later. We make a lot of money on our table games but it's the one place where employees can be in secret partnership with customers to cheat us. We can find out if we can keep excellent records and that is where you can help us.

Let's start with the blackjack (BJ) tables. Each BJ table has only one dealer at a time. That dealer deals cards for about 45 minutes and then another dealer relieves him or her. We don't want our dealers to get too tired. The same dealer who just left the table takes a break and then comes back to the same table or a different table after his rest. We need to keep good records of who the dealer is at each table and when they started and when they left. We also need to keep track of the money coming into each table and leaving each table. Tables stay open for play as long as there are customers playing at a table. When a table is completely empty (except for the dealer) then we close the table to take inventory of the money and chips. We only do this after the table has been in use for at least ten hours. Ten hours is the minimum. During our busy season, a table may be in continuous operation for 50 to 60 hours. So we need to know when the table opened for business and when we closed it. We need to know the total value of chips that the table started with and the total number of chips, total amount of cash money that the table closed with. While the table was open, we can come by to remove cash and sometimes we come to bring more chips. We do this 10 times every 24 hours to every table. We have 200 BJ tables and usually 160 are open at any time. Night or day makes no difference. You heard of 24/7? We were the original 24/7 business. The city that never sleeps!

The roulette (RU) tables work the same way except we always have two dealers on an RU table at all times. Otherwise, whatever we do with the BJ tables we also do with the RU tables. We have 50 RU tables and generally 45 are always open.

The craps (CR) tables work the same way except we always have three dealers on a CR table at all times. Otherwise, whatever we do with the BJ tables we also do with the CR tables. We have 100 CR tables and generally 90 are always open.

Dealers can usually operate any of the tables but may have different levels of skills at the 3 different games. In order, to assign employees to the tables to work as dealers we must keep a list of all employees who have at least enough skill to be a dealer in at least 1 game. We have a point system from 1 to 5 where 5 is excellent and 1 is barely acceptable. 3 is average. So for each dealer and each game we assign such a rating (from 1 to 5). These records must be available to me. I would probably refer to them 2,000 times a day. Every month, I review all the dealers (about 1,000) and usually I change the rating on about 200 of them. Usually I increase their rating but sometimes I decrease it. After the review, I usually have to fire about 50 dealers and then I hire a new 50.

Well, that's about that. Now, it's time for Rocco to take you to see our security manager, Hugh G. BiCeps. We call him MUSCLES.

HUGH G. BICEPS

Hi, I'm Hugh G. BiCeps but you can call me MUSCLES. I am in charge of security. I make sure no one is stealing money from the casino. I have a lot of people working for me. I won't tell you how many because it's a secret. If I tell you then I would have to kill you. Ha, Ha, Ha. We don't do that anymore. The most we do is a broken arm or leg or maybe both an arm and leg. The cops take a dim view of killing besides if we kill someone how are we going to get our money back? Anyway, we are all respectable here. Right, Rocco? Well, maybe all of us except Rocco. Ha, ha, ha.

Believe it or not, we have clowns who come in with guns and try to rob the casino at the cashier booth or even rob the customers by stealing their wallets or chips. We have uniformed security people to prevent that and apprehend that bum. To make our security even tighter we have organized our casino into grids. Our casino is so big it is in several buildings and on several floors. Each grid is a small piece of the casino that is manageable. We give each grid a unique number and identify it by stating the building it is in, the floor it is on, the distance from the north wall in feet, the distance from the south wall in feet, the distance from the west wall in feet and the distance from the east wall in feet. We also like to have a landmark so it's easier to find. An example of a landmark could be the big neon sign for the donut shop (SUGARY DONUTS) or the presence of the bar (WHISKEY and WINE) or the white piano.

We also have security positions manned by uniformed guards. Each position is given a unique position number and its location is given by the grid# that it is in. Also, for fast identification we keep a landmark near the security position and the distance from the north wall in feet, the distance from the south wall in feet, the distance from the west wall in feet and the distance from the east wall in feet. For each grid we also want to be able to quickly tell where the nearest security position is. For example, a customer gets violent on slot machine 359. Slot 359 is in grid 115 and grid 115 is associated with security position 88. So we can call position 88 and let them know about the problem. This happens about 500 times a day. Some grids have several security positions while some grids share a security position with other grids. We have about 500 grids and about 700 security positions. We like to change the location of the security positions frequently so robbers can not plan their robberies so easily. Every day we change about 150 security positions. It's not hard to do. On the other hand, grids are fixed and never change.

I, also, need to know which security guard is at which security position at all times. We have shifts so we need to know the start and end times for each guard at each position. Each security position has two guards and we change half the guards every hour(24/7).

We can also get robbed by having a dealer work in partnership with a customer. The only way we can tell is if a customer starts winning a lot on different tables wherever the same dealer is dealing. That makes me suspicious. I don't like that. Even more important, Rocco doesn't like that. So, I need you to keep information on customers. When they sit down on a table and when they get up. Which table is it? How much cash or chips do they play with and how much are their chips worth when they get up from the table. I need to do this for all 3 types of tables. Every day, we have about 100,000 people playing on the tables. This counts the same customer many times since a customer can play one BJ table for 30 minutes, get up go to a CR table for ten minutes and then to a RU table for twenty minutes and then back to a BJ table for an hour and so on. We only keep this information for 90 days. So every day we add 100,000 new pieces of information and you should also get rid of the oldest which is from 90 days ago.

We have a big safe in the…No, I don't want to tell you where the safe is. But it's really big and made of 2 feet thick steel. We want to keep our money in the safe so we need to collect it from the cashiers and the change machines which we call the bill breakers (BB). The cashier will change a customer's hundred-dollar bill for 5 twenty-dollar bills. Or the cashier will take a bucket of quarters and give the customer back cash money. Or the cashier will take chips and give the customer back cash money. So, the cashier needs to have a lot of cash. But we have to either take money away or give the cashier more money. We also have to take the quarters and chips away. We visit each cashier once an hour every hour. We have about 50 cashiers. We need to give each cashier a unique number and record which grid it's in and maybe record a landmark if there is one. Sometimes we have 3 or 4 cashiers next to each other so they would have the same grid number and landmark. Besides giving or taking money to or from each cashier, we also need to check out the balance at each cashier. We have different people doing this to eliminate any possibility of theft. A checker goes to each cashier once every 2 hours to count how much money in cash, coin or chips exist at the cashier at that moment. We do everything the same with the machines. The only difference is the machines only have money in them. A customer puts in a $100 bill or a $50 dollar bill and the machine makes change in $10 or $20 bills. However, we still need to empty the machine to remove high bills and put more lower bills in the machine. We do this every hour

on the hour. A checker also comes once every 2 hours to count the balance of the machine. We have about 300 such Bill Breakers.

That's it. I'll have Rocco show you to your car. Rocco, "Show him to his car and make him an offer he can't refuse!"