Data base management systems acts between your application and data that is organized one and organized data that will be manipulated new information is added all information is erased some information is updated so add remove update so those kind of operations are done on certain data and then we call that data as data base what kind of data base is interesting is interesting question and the answer is different there are different kinds of data bases different ways of organizing the same data but the idea is to act as a intermediary between your application and the data so data base management system is a kind of interface and that interface allows the last item data independence so we can change the organization of the data base without chancing the application or vice versa we can change the application and we don’t touch the data base different applications use same data or same application can use different data so they are separated in some cases we have the notion of distributed data bases distributed data base means a data reside in multiple machines in different geopgeripal places or in the same room or in machineds when you have database management system that is organized or distributed data base that data base management system can transparently (çörv) the distributed data base as a single data base to your application so your app thinks it is a single data base but in general it is a distributed data base so database management systems provides that apbility when we talk about data bases one important definition is the model. Model means conceptual view of something to work on[ if you have a car this car is manucfactured by a certain brand and that car has service these services have employees so under employees there is ali usta ali usta has a certain salary if ali usta cannot fix your car then he may get some extra penalty if he makes a mistake so they are all related so this kind of organization depending on what you need is called as data base models data base models can be relational or objent-oriented or others. There more varies types of models some of them are object oriented such as you store the information as car inside the car there is a brand there is maintenance list,owner information,license plate so everything is one object so if you have multiple cars you have multiple objects that is basically the idea the relational database model on the other hand things that each..(I have it next slayt) it is basically a rectangular table. [each one corresponds to a tuple and table is related to entity, entity means for example a car or an employee or student or car, it is a kind it is an abstract name , car when im talking about student do I mean you ? no. I mean a student. But if im talking about you,Ahmet, Ahmet is here.and hasan is here. Ayşe is here so each one is tuple and instance of an object in object oriented terms but in relational terms it is tuple. Ahmet has certain attributes. Ahmet has identity number Ahmet has a first , last name, shoe size and so on. So if im interested in students as a school as a university, im interested in students. Am I intered in shoe sizes? Probably no. But if im hepsiburada.com im interested in your shoe sizes teehrefore different tables, these are data base tables have different needs and those tables can be arranged accordingly sometimes you have an idea number. Right? And you have cars. Cars of university. That means cars that I allowed to enter the university and normally you should not be able to get into campus unless you get a permission , yearly permission from the school that needs to be done. But currently they ask you an ID and they let you in. However in modern campusus Each car must be registered to a student so that if the car is not registerd you should stay outside and walk through the gate because small amount of the money can be collected for the cars for the students from the students who owns cars and who prefer to drive here like quitw hundred lira per year and that can be collected to library so that we can purchase additional books. Therefore so you understand the reason. There are cars . what is the identifiers of car in general such as license plate so you have license plate in the cars table that table contains cars that are permitted to enter the university and you have student table if all of you have ID numbers all of you have first name,class grades, I mean you are first year student,second year student etc., all of you GPA so this kind of table if the university interested in student this table contains students with attribute that are related to university and probably available for every students some of them are foreign students. Foreign students have passport numbers so student table has passport numbers somewhere for example, john has passport number here okay? This passport number is not available for other students maybe available maybe Turkish students also have a ppassport numbers but many times no so there might be empty attribute some attributes may not be available. Do you understand? Some of them for example, who has a car? Who has a barrowed car? Who can barrow car? Who has driver license? So assume that husamettin has a car and license plate is here sometimes has a car yes no but many of them does not have in the car table you may have cars and you may have student IDs . for example, husametting has 75 as an ID im using 2 digit IDs because of the space. Okay? So, 75 is here who is from izmir? For exmp. Husamettin is from ızmır because he has the car with the licence plate 35 we call it as a relation. Relation between these.[ that’s what that’s calles as relational data base. Sometimes this table is inverted depending on the need. You have 75 here , which is the ID of husametting and then license plate. (ey?) says forth year is 1886. It should be old car in order for a student to purchase it. So , and so on… , so it depends which main attribute is connecting multiple tables, sometimes you are interested in poeple, then this is the connection sometimes you are interested more in cars license plate for exp the police then license plate is more important so we call them as KEYS in data bases KEY FIELDS in the data base sometimes some of them are more important and connect everything into each other so that is the main connection such as national ID numbers we call those keys as PRIMARY keys . each table has keys but also some keys are PRIMARY KEYS. [RELATIONAL DATABASE MODEL slaytını geçiyor.] here is the example the classical example of data base lectures are employee data base. Or student data base. Car data base. What else.. fitness centre data base. And health data base etc. for the books data base. You have an ID , name it could be different fields, first name last name. complete name, it depends how you organized your data base şema. It has an address and additional numbers that’s what a TABLE looks like. Each one is TUPLE . and the whole employee is ENTITY . Employee is ENTITY. Car is an another ENTITY. Student is an ENTITY. Class is ENTITY. For example, cse101 is a class and attributes are who is giving it? How much credit ? what is the name of the class? Which da? So, all of them are ATTRIBUTES. Do you understand? That is the relation. That relation this is a relation that relation connects attributes of Erentity(an entity?) hani beni ben yapan özellikler dediğimizde, that makes a relation. It depends for traditional things like employee data base bank account where you have many things that are very similar and not changing relational data base is better but when you have changing and developing structures such as the things that you can do, how are you going to store it? Each day you are learning something else or , continuous customization is required. If a new attribute is necessary for example shoe size. Right? Im going to present new year presents for all the empployees im going to purchase shoes and delivered before new year. I need to know the shoe sizes so I have to change the table and changing the table is very difficult task in database management sytems because these are already written on the harddrive as a single file. So database knows where to go on the file. But suddenly you say shoe sizes are also necessary. How im I going to place it? Because all the things are written on the harddrive and between each record there is no additional space. So, that is kind of difficult. For well-defined problems and not changing, not frequently changing stuff relational database is today is standard. Also there is a non-relational data bases key value data bases those are necessary for exmp you have employee name and employee ID only two things needs to be stored. When only two things needs to be stored, you may not need table. Because dealing with tables having a (roll/rool )number etc. then what they have is key value pairs. (25x15,Joe) like that, key value pairs are stored independently.So, there is no next element in that kind of database we don’t where next element is, we just know what is the name of this guy, I can tell that, but there is no next or anything stored in a single file. Things come one after another. So, how am I going to find joe on the harddrive because this is processed and mapped to a certain location each time in a function so we call it as key value data base and those key data bases are very common. Commonly used in big data problems big data applications because the size of data can be much bigger and can still be processed by multiple machines with little bit easier tekniks in a cheaper structure bc database management systems if a lot of records involved, gets slow, and they are expensive. [RELATIONAL DESIGN SLAYTINA GECTI] this is(Avoid multiple concepts within one relation) I have already explained and important things. You have shoe sizes and you have employees you have employees you have ID one thing is store shoe sizes here. This is employee 75 this is hasan etc.. okay? But if shoe business if shoe giving a present for new year is going to be done only one time it is not a general property it is not a general concept with the company employee records with the salaryies,addresses.. etc. so don’t get it into that same table, put it in a separate table, just like the cars bc not every student has the car so therefore new year shoe info adında make another table put an ID here. Shoe size, maybe brand and color , right? So ID is 75 shoe size is 41 and color is brown. Color preference. You collect color preferences using a web application from all the employees to give new year presents right? So you can record it when you are going to provide this information to the shoe company or shoe maker or hepsibrada or whatever, you can work with this table rather than working with the whole employee table that includes employee salaryies addressiz which department working in etc.so, forget about company employee records focus on shoe present issue. So, avoid multiple concept in one relation, in one table. That is extremely important. If you do that, usually there will be many empty spaces in your table. Those empty spaces are considered as wasted although there are techincs to compensated but the main idea is that may lead to difficulties and slow down in processing the relation . also it may give you logical errors. Because you are a person you are an employee you also have a hospital records also have car records if I put everything in one line, that means im considering everything at ones. If ım only interested in your cars’ licence plate from data base, first I need to read everything including your family information etc. the select your licence plate. So , that is very slow. Rather, if the concept is car ownership and campus entry for a student, make a separate relation for that. Yes, some people may not be allowed to see the salary information so that table is protected for certain users but not shoe size table so shoe size table can be accessed by other people salary table might be accessed by other people.[IMPROVING A RELATIONAL DESIGN SLAYTINA GECIYOR] Ideally, that is the separating those concerns are called as DECOMPOSITION and NORMALISATION decomposition means dividing the columns of a relation into two or more relations, duplicating those columns necessary to maintain relationships such as I have already done that 75 ID HASAN 41 34HA755 and tell me a salary … 3000$ so one field is 75 3000$ and another one has 75 HASAN . another one 75 41 and another one 75 34HA775(licence plate). So im moving actually to key value big data data base I have a key which is 75, and with different tables I can store the information this can be done but sometimes this name and salary should go together in most cases, they always go together therefore don’t divide it that much , store it in a single relation. This is what we called (PRAYMIREYK??) sometimes when I decompose I can lose certain information im not interested in certain cases for exmp I can only take first name and last name I can omit middle name then it will be decomposition with data loss if im not interested . what if we have 2 people with same ID number? We should not have, you should take measures . data base management syttems also if the field is labeled as key , then when you are inserting a new record, when you try to write a new record to data base, data base management system says no. there is already a record. You cannot write. There must (bener??) so 75 31 hasan license plate if you combine everything there is a keyword called reduncancy. We have an interesting table here. We have an emply id, name,address,social security number,job id,job title,…. Term date. Employ ID because it is not labeled as primary key, just relation. Name joy beker addres, social security num is here. He has two positions two duties. One is floor manager, also dept head. Because in some dates he is working in floor manager later he moved to the department head, so he got promoted. So, job ID changed. Joe Baker has two jobs in the same company and it needs to be stored. If I try to store that in a single relation here we have a reduncancy im repeating address these numbers and name twice that means I need to store these in a separate table if I can store it as a separate table, I don’t have to repeat the address therefore I need to store the address in a different table. This past,the left part, in a different table. This is a REDUNDANT information. (Soruya cevap = data base dediğin şey excel gibi bir şey, excel’e iki satır yazdığını düşün,getirir, 2 tane. Mesela Muhammet Yıldız adı son yıllarda çok fazla. Hangi çocuk olduğunu ancak öğrenci numarasından anlaşılıyor, onun gibi. Yok, tarihleri farklı, aynı kişinin iki ayrı bilgisi var orada. Benim iki arabam var,hadi bakalım , ne yapacan? Kampüse sokucam ikisini de. Nereye kaydedeceksin onları? Demekki ayrı tablolara koyman lazım arabaları. Birden çok araba varsa bu araba kimin diye bakmak daha doğru olur, arabaları alt alta yazdıktan sonra.) Now,decomposing,employee ID, Name, Address and Social security number, pretty good. So, which guy company ID student name address and Turkish ID but the relation in the relation when im talking about job relation, what is the primary thing? Job, so this job has a name and skill code something related and department so that job definition . each person may have a different job, multiple jobs,maybe. In different dates. So, concerns are separated.So, issues are separated. This is the person data base this is the job relation data base. Actually, three of them must be called as data base, one of them must be called as table.But im only focusing on one this is also data base.Third, the assignment, this employee has job ID , start date end End date.same guy, has different job ID, start date and end date. So, this is better.If you are not satisfied if you want to singularize these two , then you need to create an initial(inşınıl) variable using employee ID and date together create a key and use that key is at the very left to differentiate between multiple records. Because this is a different record than other. Different TUPLE, different record. (Soruya cevap = this entity is assignment, this entity is job, this entity is employee. In the job relation, Job Tıtle, Skıll Code and Departments are attributes. In the assignment relation, Employee is the attribute. In the Employee relation, employee is employee, Attributes are ID , Name, Address and SSN. Good data base design is very crucial for writing efficient programs, efficient fast programs. And leads to usable and logical output . Years ago, I was visiting a some kind of exhibition in Tüyap. There was a police car computer. Police car computers mobile big computer was installed police car and they were able to ask licence plate whether the car is legitimate or stolen etc. in the police car what I saw was, you enter licence plate,(plaka) hit enter. Next result is along single line component first one is licence plate second one is long engine number. Second one is saşe number and the last one is displaying the car is stolen or not. In order to see that part, you need to play with these arrows. Furthermore,since one licence plate corresponds to one car, rest of the screen was wasted, empty bc you are searching for single car generally , if there is an error, there is another issue. So, in the police car, unfortunately, it was very difficult to on the move, it was very difficult to scroll to the right in the window, and see whether the car is stolen or not. It was only showing engine number. Why was it that? Because data base contained all those information including whether the car stolen who owns it which city is registered etc. but the order in the table is directly reflected in the application program. The programmer didn’t think about what are the needs of police guy while he is driving and asking the licence plate the first thing you need is what is the name of the person who owns it and is it stolen or is is being looked for, those information were available but not visible immediately. Immediately visible thing was engine number, which is not necessary while on the road. Therefore good data base design should be accompanying by good application design together so that the information presented to user becomes usable and becomes helpful[FINDING THE DEPARTMENTS IN WHICH EMOLOYEE 23Y34 HAS WORKED SLAYTINA GEÇİYOR]. This is how logic works. This guy, I’m interested in this guy, first I look for these 2 jobs , As a first step, I go to ‘’ASSIGNMENT relation’’ and take job ID and Employe ID . As a second step, I go to ‘’JOB relation’’ and go to the satır in which Job ID that I chosed in the first step is here. If im required to print addresses and names of the same employee , As a first step, I also look ‘’EMPLOYEE relation’’ table, to print address information in the user interface. [A RELATİON AND A PROPOSED DECOMPOSITION slaytına geçiyor]. In the first table, im going to talk about what we have done in the previous slide. We had employee ID , we had Job Tıtle and we had Department information so we said those are separate issues , separate interesting things, not the same thing im talking about the person but those job titles and departments are containing various different information that may be duplicated and that maybe organized differently therefore , I connect Employee ID and Job Title, Job Title to Department [Soruya cevap = No, the example says department information is different than job title. They are related of course. ….. Birden fazla kişi çalışıyor olabilir aynı departmenda . Job title unique değil, birden fazla duplicate olabilir. Yaratır, ama better ] [RELATIONAL OPERATIONS SLAYTINA GECIYOR] . Bu işlem ya da ayrı olanları birleştirmek gibi işlemler mesela ayırmak birleştirmek gibi işlemler data base management sistemlerinin şeyi. The things that we were talking about has different names in data base jargon, in data base management systems ,languages those definitions. One key word is SELECT other one is PROJECT , other one is JOIN . Select means this : Ahmet , Mehmet , hüseyin come here. That is select. Project : I’m only interested in your names and shoe sizes . that is project. I have a bigger table im only interested in certain colors. JOIN means I have multiple tables I have presented thirty tables I have car information, I’m going to combine them into single table. Why because I’m going to print them or im going to match which licence plates corresponds to shoe size I don’t know why but if I need smt like that I can join . Actually join is an interesting operation and hard operation. It takes a lot of effort in data base machine therefore if your program uses a lot of joins , it means your program can work slower and your data base is not organized correctly, if you need a lot of joins. Sometimes you need because times change and maybe it is required join is join could be necessary but if you are doing joins in big tables like the number of patients in hospital is like hundred thousands. If you need a join , click two days or three days or one week or join therefore you need to write your database structure you need to adjust your tables so that it will suit your needs as you generate the data, join is actually this is something , I’m looking at that if I want to if I need to look like this every day , this technic is not good so I have to hold it like this. So I need to adjust my table before I use it in the design of the data base table I need to consider how am I going to consider otherwise I need a lot of joins projection and select is usually more acceptable and very frequently use, select a lot. Comments and functions. When you are going to print something from data base the most frequently used thing is comment is select. It ıs available in any data base languages, select. Also project and join as well. But select is the most frequent one. Select insert, delete remove, those kind of keywords.[THE SELECT OPERATION SLAYTINA GECIYOR]. So, in one data base management system is named as SQL DBMS(data base management system) it could be MSQL, Mıcrosoft SQL,(host gress SQL??) there are multiple SQL database management systems. But what is SQL? Sql means ‘’SEQUENTIVE QUERY LANGUAGE”. So, SQL is actually the name of the language but that kind of language is used for manipulating data, true data base. So data base management system understands that language and manipulates data. You don’t touch data. You talk to database management system, using SQL language database management system understands SQL language your application uses SQL language to data base management system . Database management system performs operation by itself. How it is performed? I don’t know we don’t know. Microsoft SQL works differently MSL SQL works differently , oracle works differently….. etc. but from my application, it doesn’t matter. I connect to data base I send commends and data, I use it using SQL language. Apartman görevlisi gibi dedik ya, kaloriferi yakmayı biliyor, sen sadece abi üşüdük diyorsun. Başka bir görevli geliyor, ona da abi üşüdük diyorsun. Ha bazen yabancı gelip türkçe bilmiyor problemleri falan olabilir. İşte o zaman marka değişikliği olduğunda bazı ayarlamalar yapman gerekebilir tabi. Ama gene üşüdüme benzer bir şey söylemen lazım. So, this is our employee name address table the simple SQL language works this way. Selects, this is not complete syntax but pseudo code = \*\*\* NEW 🡨 SELECT from EMPLOYEE where Emplid = “34Y70”. So this is simple data base query. What is query? Smt like asking question. So, the word “QUERY” is used for things comments that are interacting with data base.So, if you say something to data base, apartman yöneticisi, we call it as query, data base query. Whether it is asking or storing or deleting , they are all query. But query is more related from the original word “question”. It is more frequently used for “looking for something from database” it is therefore associated mostly with “SELECT” key word, or find smt like that. Another famous key word is “where”. “Where” key word is used for indicating which lines I’m going to pick. I’m going to check all the lines and I’m going to pick the lines if employee ID is 34Y70. It could be more than one. If there are more records, multiple records will be displayed. For exmp, when I go to, banks they ask my name and I say Mehmet göktürk. They are usually 5 mehmet göktürk in the customer list, and they are checking they ask me what is your address or what is your phone number, they try to find out which Mehmet göktürk is me by looking at the other, and they scroll down and enter to the correct customer. So, “WHERE” employee IDs selects from employee, what is employee? It is the name of the table. Each table has the name of the relation. That is relation. So , this employee relation, you get as “SELECT” this is the comment, from EMPLOYEE and employee ID is this. It creates a new table temporarily. That table is in the memory usually it is returned to application program and printed by the user as a result or you can store it to somewhere else. That relation now after this contains that(??). [THE PROJECT OPERATION SLAYTINA GECIYOR]. Pseudo Code is = MAIL <- PROJECT Name, Address from EMPLOYEE . So, im not interested in SSC bc it is private. A new table is created temporarily you can store it somewhere or you can use it as it is , you can print it save it send it to webpage, such as you are listing, listing the items that are available for sale in hepsiburada or sahibindencom search, searching for houses ,cars ,phones, that is a simple projection, you are not interested in certain parameters, you are only interested in some parts. [ THE JOIN OPERATION SLAYTINA GECIYOR]. Join, the dangerous JOIN.. you have this relation , another relation pseudo code = C <- JOIN A and B where A.W = B.X if you have a car join two tables so that the car licence plate is added so then I have name number licence plate etc. only, so, it is joined under some rule therefore I can pick at the same time but I have a longer table. In the cars table, this licence plate has mitsubihsi and LPG(fuel type) so if I join this , join A(employee) and B(cars) these relations these two tables(Relation A and Relation B) join employee and cars where the condition(if) is for everything = A.W = B.X . So, if there is a licence plate on the right side combine them so that I can see them all and the result will be hasan , licence plate, licence plate , brand , fuel type . you can later eliminate licence plate, licence plate. But now I have a table containing only people with cars I don’t have for exmp , p here. Because person p , perihan does not have a car therefore does not have a licence plate therefore has no fuel type, therefore has no brand bc she has no car.so in those cases, I need join. [Soruya cevap = Aslında seçerek birleştiriyorsun. Vertical separation is PROJECTION , horizontal separation is SELECTION, vertical combination is joining and when you are joining two tables, usually you don’t join all together , you join based on a condition like this, so , join with a condition gives you some processing capability. So, it puts everything together, some of them will be empty bc if you don’t have condition here , p , 6 , p and 6 will be empty. NULL NULL NULL. [ANOTHER EXAMPLE OF THE JOIN OPERATION SLAYTINA GECIYOR] . I need to check 15 times. There is a lot of work. So, it is a difficult task, conditional join.[ Soruya cevap = İki farklı data tablosunu yan yana getirip birleştiriyor. Biraz önce ayakkabı no lar bir yerde adresler bir yerde toplandı. Ayakkabıları aldın hediye paketi yapacaksın üstlerine adreslerini bastıracaksın, orada bir join yapıp adres etiketiyle adamın adını kutulara basacaksın mesela. Öyle bir durumda gerekir.[AN APPLICATION OF THE JOIN OPERATION SLAYTINA GECIYOR]. You have created another table that contains all the information now you have everything. This JOIN is usually preferred by web developers where they want to see every information available to user arranged from different tables like customer information or product information . [STRUCTURED QUERY LANGUAGE SLAYTINA GECIYOR]. Structured Query Language(SQL) has various keywords. It is a language to talk to database management system the famoust keyword is SELECT in addition to that, there are insert , update and delete. There are other keywords, too. Not only 4 . But these are most commonly and famously used ones. To create a new record INSERT , modify a record UPDATE , delete a record DELETE , and SELECT retrieve the record from the data base. When you get smt from the data base, what happens to the thing in the data base? It stays there. So, it is not like movement. It is like being copied.[ SQL EXAMPLES SLAYTINA GECİYOR] . [Soruya cevap =Database management systeme bir şey söyleyeceğin zaman, sen bunu kendi programının içinden kullanıyorsun.Yani mesela apartman yöneticisiyle(görev açısından) ekmek alır mısın nasılsın günaydın gibi diyalogların olur, tutup da ülke nereye gidiyor gibi bir muhabbetin olmaz. Database ile konuştuğun da sadece bunlar] [SQL EXAMPLES SLAYTINA GECIYOR.] A lot of work done in industry is related to data base. I would say %90 of tasks, one way another uses data base management systems in industry so there is no way of escaping unless you are working some kind of research facility, aselsan or smt that is very related to rockets etc. even there is data base bc there is going to store information. Again, certain portion of those search facilities also uses data base to store data.] Changing key word is UPDATE. SET means change. If there is two Joe.E. Baker, it changes two of them.Dolayısıyla bankadaki 5 mehmet göktürkün de adresi değişti.Demekki isme göre yapmamak lazım bankada.Hesap numarasına göre belki. [OBJECT-ORIENTED DATABASES SLAYTINA GECIYOR.] . There are object oriented databases each entity is stored as different objects so rather than lines I have different boxes each box is the instance of the object relationships indicated by links between objects there are links between the objects database management system tracks all those links. the need for the object oriented data base I say at the beginning, if you need a lot of changes, rethinking, revisiting and if you are not sure what you are doing at the same time, object oriented data base might be an alternative . But if you think about the percentage , a lot of them is relational .big portion of the database is are relational database. [ THE ASSOCİATİONS BETWEEN OBJECTS IN AN OBJECT-ORİENTED DATABASE ] . This is job, assignment, job different employee … etc.(yuvarlak şekiller var). This is for example,in some case this is secretary this is flowmanager, so , this employee, for exmp. In some case, it can be both flowmanager and secretery . [ADVANTAGES OF OBJECT-ORIENTED DATABASES] . As I said why we are using it, exotic data types, if you are not sure what you are doing if it is a new data type, changing data type , it can be handled, intelligence can be built into attributes so it can be active objects, since you are very new to object oriented paradigm when we are thinking about object-oriented approach, objects are intelligent, objects have behaviours, therefore, if we have database related ,organized as object oriented data base those objects might have intelligence actually relational data base also have some intelligence, how? in the relational data base you can put some functions in the table, so If this table has satisfying certain condition, this function is executed.So, if SELECT hits(?) that attribute, that function is executed. So it is very fast actually, those data base management systems for exmp. When you select them they are otomatically connected to some kind of server otomatically, when you select them the connection is or payments are otomatically done. When you find them, the job is done. You don’t have to do it with another application the functionality can be built into relational data base.Obviously with the big ones. [MAINTAINING DATABASE INTEGRITY SLAYTINA GECIYOR.] . Database also allows us to undo certain things , that was the question. You can have undo operations. You can have transaction definition. Transaction definition is like money drawing from the bank, you check the balance, you send the command to get the money you finish you say okay so multiple steps are required for completing a transaction. If that is not complete, we have to undo the first part.So, if some operation is required to consist of multiple steps and we need to have it finish or nothing we call it as TRANSACTION. It is either completed, or rolled back.after transaction is finished we say transaction is committed money iss transferred if the money is taken but not send, you have to put it back. We call it as ROLL-BACK mechanism. So, all these mechanisms are built into database so that you don’t worry about that much, just configure it at the beginning, whether you have roll back, what is transaction you say transaction begin transaction end anything in between if there is an error, previous steps are undone. Also databases allow you to use database simultaneously but not so simultaneously so that particular variable becomes dirty so, that also includes providing LOCKING of certain record until a transaction is finished, so two same transactions cannot access the same data together they can access to same data base but they cannot change a particular line at the same time because you may not be sure which one is going to be first . So, locking mechanisms are also supported. If it is only a read-only, we call it as shared mechanism, if it has write permission if people are writing on it like drawing money from the bank because it is going to chance it then LOCKING is required bc you cannot manipulate bank account at the same time but you can read it.