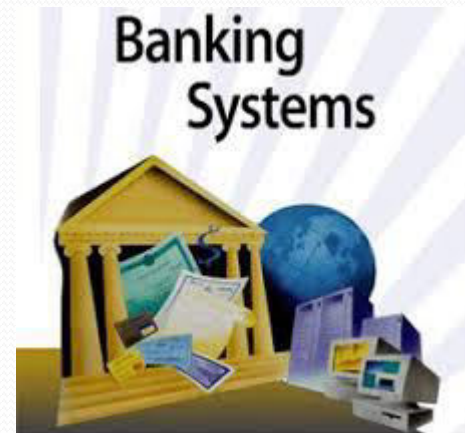
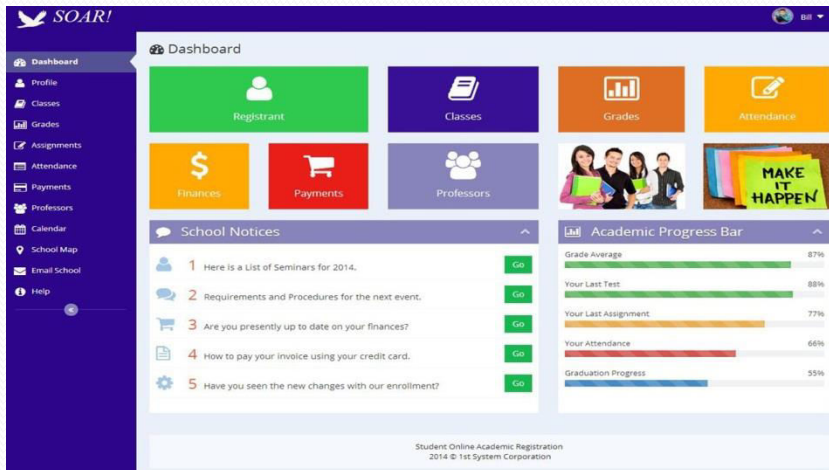


Database



Data everywhere !!!



What is database ??

Person

Login	LastName	FirstName
skol	Kovalevskaya	Sofia
mlom	Lomonosov	Mikhail
dmitri	Mendeleev	Dmitri
ivan	Pavlov	Ivan

Project

ProjectId	ProjectName
1214	Antigravity
1709	Teleportation
1737	Time Travel

Experiment

ProjectId	ExperimentId	NumInvolved	ExperimentDate	Hours
1214	1	1	NULL	1.5
1214	2	1	1889-11-01	14.3
1709	1	3	1891-01-22	7.0
1709	2	1	1891-02-23	7.2
1737	1	1	1900-07-05	-1.0
1737	2	2	1900-07-05	-1.5

Involved

ProjectId	ExperimentId	InvolvedId	Login
1214	1	1	mlom
1214	2	1	mlom
1709	1	1	dmitri
1709	1	2	skol
1709	1	3	ivan
1709	2	1	mlom
1737	1	1	skol
1737	2	1	skol
1737	2	2	ivan

What about files ???



Files

Asma, 20179000, asm2017@std.psut.edu.jo, 0777888888

Amal, 20155000, ama2015@std.psut.edu.jo, 0777999998

Anas, 20199000, ana2019@std.psut.edu.jo, 0799888888

Alaa, 20119000, ala2011@std.psut.edu.jo, 0788888888

Ali, 20149000, ali2014@std.psut.edu.jo, 0787777778

...

...

...

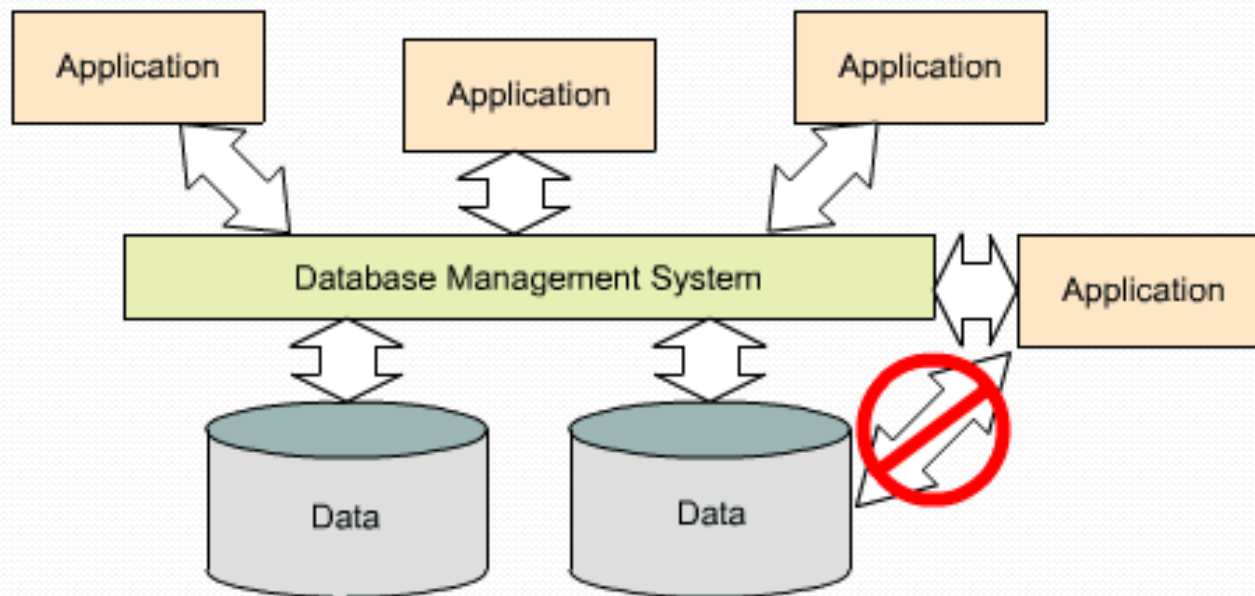
Database features

- Self-describing nature of a database system
- Insulation between programs and data, and data abstraction
- Support of multiple views of the data
- Sharing of data and multiuser transaction processing

The complete process

- Requirements specification and analysis
- Conceptual design
- Logical design
- Physical design

How to access the database



DBMS



In this course

- ☐ Oracle DBMS
- ☐ SQL*Plus



Why should we study DB?????

Why should we study DB?????



Structured query language (SQL)

SELECT	Data retrieval
INSERT UPDATE DELETE	Data manipulation language (DML)
CREATE ALTER DROP RENAME TRUNCATE	Data definition language (DDL)
COMMIT ROLLBACK SAVEPOINT	Transaction control
GRANT REVOKE	Data control language (DCL)

Data Retrieval

Doctors

ID	Name	Sal	address

Doctors

Departments

Appointments

Patient

Query: retrieve the id and salary for
the doctors who lives in Amman

Data Retrieval

Doctors

ID	Name	Sal	address
				.	
			Amman		
			Amman		

Doctors

Departments

Appointments

Patient

Determine the following:

- 1) Which table?
- 2) Which columns?
- 3) Which rows?(condition)
- 4) How to order the result?

Select Statement

```
Select  cols
From    Table-Name
Where   Condition
Order by cols
```


Data Retrieval

Doctors

id	fname	Lname	bdate	address	sal	Dno
1255	Ahmad	sami	9-May-1979	Amman	2000	20
1314	Sara	ali	1-jan-1996	Irbid	1550	20
1772	Sana	khalil	5-mar-1960	Ajloun	3000	1
5988	mohammad	qais	10-aug-1988	Karak	5700	5
3421	leen	wesam	10-feb-1987	Amman	2500	3

Basic Data Retrieval

□ Select **fname**, **bdate**, **sal** from **doctors**

fname	bdate	sal
Ahmad	9-May-1979	2000
Sara	1-jan-1996	1550
Sana	5-mar-1960	3000
mohammad	10-aug-1988	5700
leen	10-feb-1987	2500

Basic Data Retrieval

□ **Select** * **from** doctors

id	fname	Lname	bdate	address	sal	Dno
1255	Ahmad	sami	9-May-1979	Amman	2000	20
1314	Sara	ali	1-jan-1996	Irbid	1550	20
1772	Sana	khalil	5-mar-1960	Ajloun	3000	1
5988	mohammad	qais	10-aug-1988	Karak	5700	5
3421	leen	wesam	10-feb-1987	Amman	2500	3

Data Retrieval (operations)

□ **Select** fname, sal * 12 **from** doctors

fname	sal * 12
Ahmad	24000
Sara	1860
Sana	36000
mohammad	68400
leen	30000

Data Retrieval (operations)

Operator	Description
+	Add
-	Subtract
*	Multiply
/	Divide

Operator Precedence

*** / + -**

Data Retrieval (Alias)

□ **Select** fname **as** “First Name”, sal * 12 **as** “Annual Salary” **from** doctors

First Name	Annual Salary
Ahmad	24000
Sara	1860
Sana	36000
mohammad	68400
leen	30000

Data Retrieval (Alias)

- **Select** fname “First Name”, sal * 12 “Annual Salary”
from doctors
- **As** is optional

First Name	Annual Salary
Ahmad	24000
Sara	1860
Sana	36000
mohammad	68400
leen	30000

Data Retrieval (Alias)

- **Select** fname FirstName, sal * 12 “Annual Salary”
from doctors
- “” is optional

FIRSTNAME	Annual Salary
Ahmad	24000
Sara	1860
Sana	36000
mohammad	68400
leen	30000

Data Retrieval

□ **Select** address **from** doctors

address
Amman
Irbid
Ajloun
Karak
Amman

Data Retrieval (distinct)

- Select distinct address from doctors

address
Amman
Irbid
Ajloun
Karak

- Two columns

ID	Name
1	Ali
2	Sama
3	Ali
2	Sama

Concatenation

□ **Select** id, fname || lname **as** “Name” **from** doctors

id	Name
1255	Ahmad sami
1314	Sara ali
1772	Sanakhalil
5988	mohammadqais
3421	leenwesam

Concatenation

□ **Select** id, fname || ' ' || lname **as** "Name" **from** doctors

id	Name
1255	Ahmad sami
1314	Sara ali
1772	Sana khalil
5988	Mohammad qais
3421	Leen wesam

Concatenation

❑ **Select** fname ||' lives in '|| address details **from** doctors

DETAILS

Ahmad lives in Amman

Sara lives in Irbid

Sana lives in Ajloun

Mohammad lives in Karak

Leen lives in Amman

Describe

- To view the structure of the table use **describe** keyword:

describe TableName

- Example:

describe books



```
SQL Plus
Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.1.0 - 64bit Production
With the Partitioning, Oracle Label Security, OLAP, Advanced Analytics,
Oracle Database Vault and Real Application Testing options
SQL> describe books
Name                               Null?    Type
-----
ID                                  NOT NULL NUMBER(38)
NAME                               VARCHA VARCHAR2(100)
PRICE                              NUMBER(38)
```