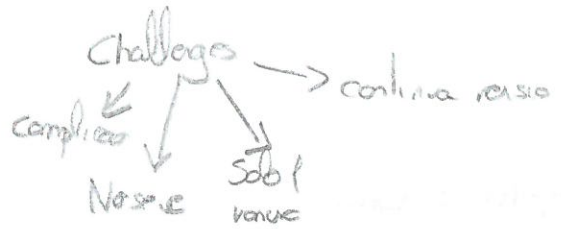


Some challenges

- C.S is not simple
- Attacks only need a single weakness
- C.S requires regular monitoring
- Hard to see the benefits



Cyber attacks

Ashley Madison ⇒ ∞

Mafia Boy ⇒ DDOS

Sofiet pipeline ⇒ Trojan

The Sony hack ⇒ North Korea

Yahoo theft ⇒ Data Stolen

Shamoon virus ⇒ Energy companies

Titan rain ⇒ Sensitive data to China

Coosge ⇒ UK military

Wamacy ⇒ Ransomware

Too valuable
also, enhance
confidence
Innovation, effort
Si duos, for 1

Types of encryption

- Cryptography: The art of writing or solving codes
- Encryption: Convert information or data into code

Public key ⇒ Used by anyone

Private key ⇒ Used by the recipient

Symmetric encryption

Only sender and receiver know the key

↳ Stream ciphers ⇒ bit by bit

↳ Block ciphers ⇒ blocks of bits

Asymmetric encryption

Two keys, public and private

↳ for the person who creates both

• RSA algorithm

First used, two keys, based on factoring the product of two large prime numbers

Digital Signature

↳ Purposes: Authentication, non-repudiation, integrity

↳ Doesn't give confidentiality

Digital certificate

↳ Lo que usan mis padres. Third party person

Hash function

Steal passwords

* Computer Security

- Security: "The state of being free from danger"
- Computer Security: The state of being protected against the criminal or unauthorized use of data "
- The CIA triad:

C: Confidentiality

Property that an asset is not made available to individuals

I: Integrity

Property of accuracy and completeness

A: Availability

Property of being accessible and usable upon demand by an authorized entity

Other security aspects: Authenticity, accountability, non-repudiation and reliability

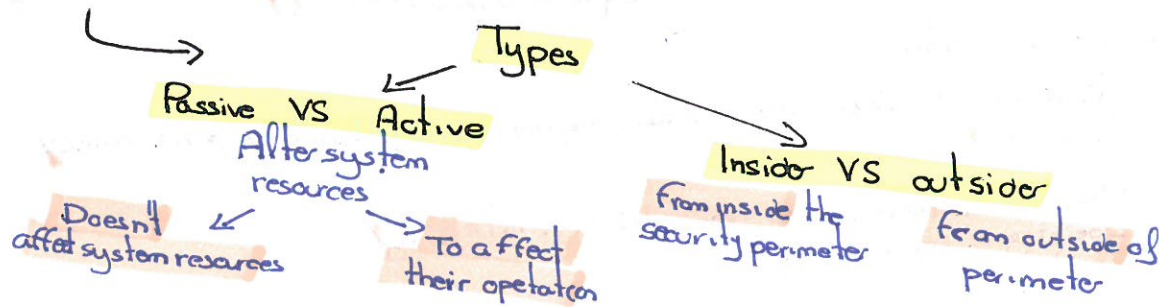
- Vulnerability: Weakness of an asset or control that can be exploited by some threats.
↳ Public WiFi on smartphones

- Threat: Potential cause of an unwanted incident, which may result in harm to a system
↳ somebody accessing the data exchanged

- Risk: Effect of uncertainty on objectives

→ Missing data encryption, weak passwords, unrestricted upload of dangerous file types

- Attacks: Attempts to destroy, expose, alter or steal data to unauthorized access or make unauthorized use of an asset



→ Specific possible attacks

Malware, phishing, password attacks, DDoS, man in the middle and rogue Software

level of risk?

This is a risk management process.

4 Basic protection measures

To deal with security attacks, minimize the level of risk

- SSL/TLS, a set of protocols

The TLS is created client — server

↳ Then, connection can be established

- HTTPS: HTTP + SSL 

- SSH: Para teletrabajo 

- Antivirus: Computer program to prevent, detect and remove malware

- Firewall: Effective for protecting local networks  INTERNET

- Intrusion detection system: Monitors the characteristics of a host to identify sus
↳ Sensors, analysers, user interface

- VPN: common for remote work

making private networks from a public one

- Audits: Official and systematic inspection ⇒ Audit trail: Toma cronológica de datos para alguna resolución
↳ Análisis para la seguridad genérica

- Access Control: Security policy that specifies who or what may have
↳ Directory, role-based...

1. The first part of the paper is devoted to a discussion of the general principles of the theory of the structure of the atom.

2. The second part of the paper is devoted to a discussion of the general principles of the theory of the structure of the atom.

3. The third part of the paper is devoted to a discussion of the general principles of the theory of the structure of the atom.

4. The fourth part of the paper is devoted to a discussion of the general principles of the theory of the structure of the atom.

5. The fifth part of the paper is devoted to a discussion of the general principles of the theory of the structure of the atom.

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9. The ninth part of the paper is devoted to a discussion of the general principles of the theory of the structure of the atom.

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11. The eleventh part of the paper is devoted to a discussion of the general principles of the theory of the structure of the atom.

12. The twelfth part of the paper is devoted to a discussion of the general principles of the theory of the structure of the atom.

13. The thirteenth part of the paper is devoted to a discussion of the general principles of the theory of the structure of the atom.

Requirements Engineering

NEEDS to be SOLVE



Software Process Models

Hardest part? $\Rightarrow$ Decide what to build

MsCommunication
Changing goals
Insufficient support

Other types: Safety-critical systems dev.

Woman:

Margaret Hamblon: Apollo

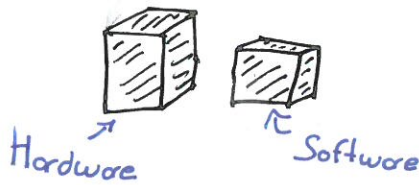
Anita Borg: Incorporación de la mujer

Frances Elizabeth Allen: Optimización compiladores

Grace Hopper: Científica y militar, primer compilador para un lenguaje

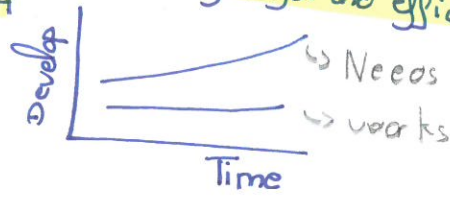
Development of Computer Systems

Software Crisis



NATO 1969

• Need of useful and efficient computer programs

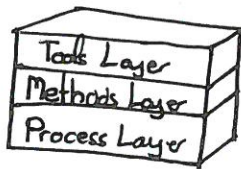


- Science: Systematic study, observation and experiment
- Engineering: Science, design, building and use
- Quality: Degree of excellence

Computer Science
Study of computer principles
↙ ↘
Study processes with data and programs

Systems Engineering
↳ How to manage complex systems over their lifecycles → creation ⇒ maintenance
↳ All mixed, people, services, processes...

Software Engineering



- Tools layer: Provides automation support and aids.
- Methods layer: Proven techniques to perform activities
- Process layer: Framework and order of activities. How??

- From concept to maintenance
- Involves business and technical needs
- Systematic application to the development of quality software

☆ Fields and processes: Requirements, design, Implementation, Validation, Maintenance

- Stakeholders: People with interest in a system, can be conflicting interests
- Personas: Fictional characters that represents the user types
- User Stories: "As a <type of user>, I want to <do some task> so that <reason>"

Prototyping

Low Fidelity (basic) VS High Fidelity (detailed)

"Simulating the experience", to help the stakeholders to make an idea

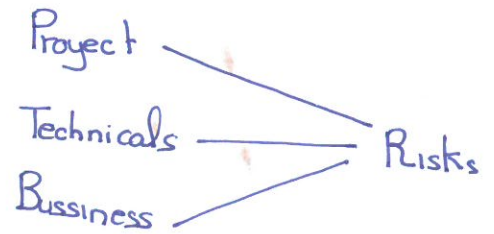
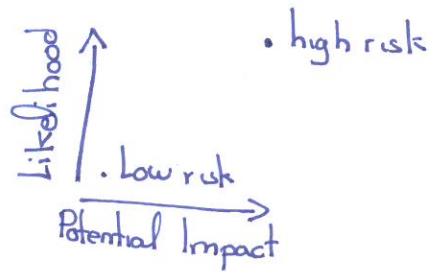
Functional VS Non-functional

Evolutionary VS Throwaway

Horizontal VS Vertical

- Case tools: Design and implement SW Apps
 - ↳ ER Diagrams

- Risk management: Identify possible risks, to handle possible risks
 - ↳ Risk score



Software Development

We need a software process, need to be systematic and technical with an outcome

1-Waterfall

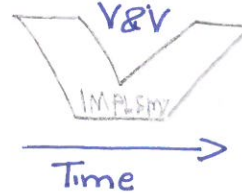


Concept → Testing.

Order one by one, strict

★ Early errors

2-V Model



3-Incremental model



Series of waterfall cascades

Every increment ends up with a delivery

4-Iterative models



Starts with a minimal working program and adds pieces until you think it's finished

Might not be incremental

5-(Rational) Unified Process model (RUP)

Como empresas

Prototyping
Not easy to plan

↳ Spiral



Risk reduction
Software early
Incremental

Agile

Interact more with the customer, add changes, answers... Simplicity

- Manifesto ⇒
1. Interactions over processes
 2. Working on documentation
 3. Customer collaboration
 4. Respond to changes

4. The name of the companies that have supplied products for which we don't know their category, and the name of the products

companyName	name
Pavlova, Ltd.	tvsony
Pavlova, Ltd.	tvtelefonken
Formaggi Fortini s.r.l.	tv Samsung

5. How many suppliers have not provided anything

numberOfSuppliersThatHaveNotProvided
3

6. The name of the companies of the previous exercise

companyName
Frutas Alpacete
Tornillos Agapito
Herramientas Fillo

7. The name of the product, the amount delivered, and the ID of the order for the orders managed by Anne or Steven, ordered according to the ID of the orders

name	amount	orderId
Inlagd Sill	25	10255
Pavlova	35	10255
Nord-Ost Matjeshering	60	10263
Guaraná Fantástica	28	10263
Pavlova	60	10263
Veggie-spread	80	10324
Steeleye Stout	70	10324
Pavlova	21	10324
Inlagd Sill	20	10358
Sasquatch Ale	10	10358
Guaraná Fantástica	10	10358
Gorgonzola Telino	70	10359
Pavlova	56	10359
Queso Cabrales	10	11043

8. The shipping name, the contact person of the customer, the name of the employee, and the name of the transporter of each order if the position of the employee is "Sales Manager"

shippingName	contactPerson	employee	transporter
La maison d'Asie	Annette Roulet	Steven	Speedy Express
Seven Seas Imports	Hari Kumar	Steven	Federal Shipping
Spécialités du monde	Dominique Perrier	Steven	United Package

9. The name of the products that have never been ordered

name
Northwoods Cranberry Sauce
Mishi Kobe Niku
Queso Manchego La Pastora
Gustaf's Knäckebröd
Schoggi Schokolade
Gravad lax
Ipoh Coffee
tvsony
tvtelefonken
tv Samsung

10. The ID of the client, the shipping date, the shipping cost, and the shipping cost with taxes (21%) of the orders delivered by United Package or Speedy Express whose shipping date is before 2010 and whose cost with taxes is greater than 100€

customer	shippingDate	shippingCost	shippingCostWithTaxes
ERNSH	20/07/2009	140.51 €	170.0171
SAVEA	07/10/2009	214.27 €	259.2667
SPLIR	20/10/2009	191.67 €	231.9207
ERNSH	17/11/2009	162.33 €	196.4193
ERNSH	29/11/2009	101.95 €	123.3595
SPLIR	06/12/2009	195.68 €	236.7728
ERNSH	13/12/2009	94.77 €	114.6717
SANTG	17/12/2009	93.63 €	113.2923
ERNSH	23/12/2009	126.38 €	152.9198

how_many
24

10. The name, surname, and province of the employees from the UT and WA provinces, ordered by province

name	surname	province
Lynn	Smith	UT
Robert	King	UT
Margaret	Peacock	UT
Anne	Dodsworth	WA
Laura	Callahan	WA
Michael	Suyama	WA
Steven	Buchanan	WA
Janet	Leverling	WA
Andrew	Fuller	WA
Nancy	Davolio	WA

11. ID, position, and province of the customers that work on sales (sales agent, sales manager ...), if the province is known

customerID	position	province
COMM1	Sales Associate	SP
HUNGO	Sales Associate	Co. Cork
LONEP	Sales Manager	OR
SAVEA	Sales Representative	ID
SPLIR	Sales Manager	WY

12. The ID and contact person of the customers whose contact person finishes with 'o'

customerID	contactPerson
ANATR	Ana Trujillo
ANTON	Antonio Moreno
COMM1	Pedro Alfonso
LINOD	Felipe Izquierdo
ROMEY	Alejandra Camino

SQL Queries Exercises – Orders DB (3)

1. Add the following products and suppliers

name	supplierID	categoryID	price	stock
tvsony	7		333.00 €	33
tvtelefunken	7		444.00 €	4
tvSamsung	14		500.00 €	33

companyName	contactPerson	address	city
Frutas Albacete	Manolo Garcia	calle2	Albacete
Tornillos Agapito	Ricardo Sin	Calle grande	Segovia
Herramientas Fillo	Lola Loli	Calle baja	Pamplona

Retrieve...

2. For each product whose price is between 110 and 400€, the name of the product, the price, and the name of the company that supplies the product

name	price	companyName
Thüringer Rostbratwurst	123.79 €	Plutzer Lebensmittelgroßmärkte AG
Côte de Blaye	263.50 €	Aux Joyeux ecclésiastiques
tvsony	333.00 €	Pavlova, Ltd.

3. The name of the product and the name of its category for the products that are not discontinued and whose stock is above 50

productName	categoryName
Queso Manchego La Pastora	Dairy Products
Gustaf's Knäckebröd	Grains/Cereals
Tunnbröd	Grains/Cereals
NuNuCa Nuß-Nougat-Creme	Confections
Geitost	Dairy Products
Sasquatch Ale	Beverages
Inlaga Sill	Seafood
Chartreuse verte	Beverages
Boston Crab Meat	Seafood
Jack's New England Clam Chowder	Seafood

1.1
SELECT *
FROM suppliers;

1.2
SELECT *
FROM products
WHERE discontinued = true;

1.3
SELECT *
FROM products
WHERE discontinued = true and price > 100;

1.4
SELECT country
FROM orders
WHERE employee = 4 and transporter = 3
ORDER BY country;

1.5
SELECT *
FROM Orders
WHERE year (date ()) - year(orderdate) < 13;

1.6
SELECT TOP 5 Name, Price
FROM products
WHERE categoryID = 8
ORDER BY Price DESC;

1.7
SELECT contactPerson, telephone
FROM customers
WHERE fax is null;

2.1
SELECT productid, name, price, price*1.21 AS total_price
FROM Products;

2.2
SELECT orderid, customer, employee, orderdate, deliverydate,
datevalue(deliverydate)-datevalue(orderdate)
FROM orders;

2.3
SELECT name, birthdate, datevalue("23/02/2023")-datevalue(contractdate)
FROM employees;

Max (column)

Min (column)

Having (Count Avg
Sum Condition)

Salary

select AVG(e.salary), r.nombre
from employees e, restaurantes r

Where e.codigo = r.codigo

Group by r.nombre

Having AVG(e.salary)

MEDIO

2.4

SELECT *
FROM Customers
ORDER BY country;

2.5

SELECT name, surname, country, city, postcode
FROM Employees
ORDER BY country, city;

2.6

SELECT customer, orderDate, shippingCost, country
FROM orders
WHERE shippingCost > 200
ORDER BY orderdate;

2.7

SELECT TOP 4 name, stock
FROM products
ORDER BY stock DESC;

2.8

SELECT customer, orderdate
FROM orders
WHERE MONTH(orderDate) = 7;

2.9

SELECT COUNT (*)
FROM customers
WHERE province IS NULL;

2.10

SELECT name, surname, province
FROM employees
ORDER BY province;

2.11

SELECT customerID, position, province
FROM customers
WHERE province IS NOT NULL AND position LIKE "Sales*";

2.12

SELECT customerID, contactperson
FROM customers
WHERE contactperson LIKE ("*o");

3.2

```
SELECT p.name, p.price, s.companyname
FROM products AS p, suppliers AS s
WHERE price BETWEEN 110 AND 400 AND s.supplierid=p.supplierid;
```

3.3

```
SELECT p.name, c.name
FROM products AS p, categories AS c
WHERE p.stock > 50 AND p.discontinued = false AND c.categoryid = p.categoryid;
```

3.4

```
SELECT s.companyname, p.name
FROM products AS p, suppliers AS s
WHERE p.categoryid is null AND s.supplierid=p.supplierid;
```

3.5

```
SELECT COUNT(*) AS numberOfSuppliersThatHaveNotProvided
FROM Products, Suppliers
WHERE categoryID is null AND Suppliers.supplierID = Products.supplierID;
```

3.6

```
SELECT Suppliers.companyName
FROM Suppliers
WHERE Suppliers.supplierID NOT IN (SELECT Products.supplierID FROM Products);
```

3.7

```
SELECT P.name, D.amount, D.orderID
FROM Employees AS E, Products AS P, OrderDetails AS D, Orders AS O
WHERE (E.employeeID=O.employee) AND (E.name LIKE 'Anne' OR E.name LIKE 'Steven')
AND (P.productID=D.productID) AND (O.orderID=D.orderID)
ORDER BY D.orderID;
```

3.8

```
SELECT Orders.shippingName, Customers.contactPerson, Orders.employee,
Orders.transporter
FROM Customers, Orders
WHERE Customers.position LIKE 'Sales Manager' AND Orders.customer =
Customers.customerID;
```

3.9

```
SELECT P.name
FROM Products AS P
WHERE P.productID NOT IN (SELECT D.productID FROM OrderDetails AS D);
```

4.1

```
SELECT country, count(country) AS NumberOfSuppliers
FROM Suppliers
```

GROUP BY country;

4.2

```
SELECT province, position, count(province) AS amount
FROM Employees
GROUP BY province, position;
```

4.3

```
SELECT [O].productID, Count([O].productID) AS numberOfOrders
FROM OrderDetails AS O
WHERE [O].productID IN (SELECT TOP 6 [O].productID FROM OrderDetails AS O
GROUP BY O.productID ORDER BY COUNT(*) desc)
GROUP BY [O].productID
ORDER BY [O].productID;
```

4.4

```
SELECT TOP 6 O.productID, P.name, count(O.productID) AS numberOfOrders
FROM OrderDetails AS O, Products AS P
WHERE P.productID=O.productID AND O.productID IN (SELECT TOP 6 O.productID FROM
OrderDetails AS O GROUP BY O.productID ORDER BY COUNT(*) desc)
GROUP BY O.productID, P.name
ORDER BY O.productID;
```

4.5

```
SELECT O.city, D.productID, COUNT(D.productID) AS timesOrdered
FROM OrderDetails AS D, Orders AS O
WHERE D.orderID=O.orderID
GROUP BY D.productID, O.city
HAVING COUNT(D.productID)>1;
```

4.6

```
SELECT U.companyName, C.name, SUM(P.price*D.amount) AS totalExpense
FROM Categories AS C, Customers AS U, Products AS P, Orders AS O, OrderDetails AS D
WHERE P.categoryID=C.categoryID And C.name Like 'Condiments' And
U.customerID=[O].customer And [O].orderID=D.orderID And D.productID=P.productID
GROUP BY C.name, U.companyName
HAVING SUM(P.price*D.amount)>1000;
```

Database Relationship Model.

- **Types of cardinality:** One-to-one, one-to-many and many-to-many.
- **Entity:** a thing of the real world, unique in a diagram
- **Attributes:** from the entities (describe them)

→ Main identifier (only 1) → Reg

—● plate number

→ Alternative identifier (there can be more)

—○ frame number

Keys of a transaction: ACID

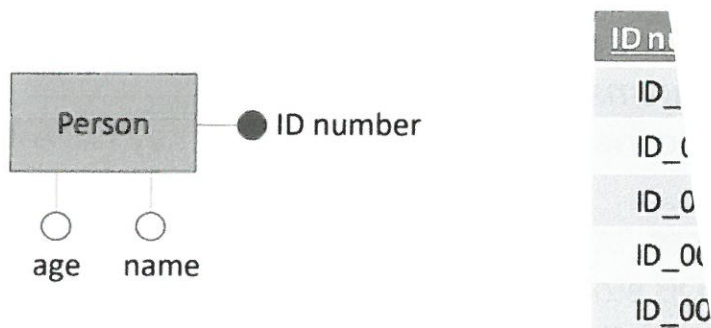
Atomicity
Consistency
Isolation
Durability

- **Relationships:** how entities are associated or interaction

Column (attribute)

Name	Telephone Number	
John Smith	666555444	
Mary Johnson	655655655	1
Juan Gomez	625256625	A
Joe McGregor	639852147	Cu
Ana Garcia	654123987	Ca

Person (ID number, name, age)



Information Systems, Information Management

Unit 2

What's a database?

Database: collection of related data(names, tfl numbers...)

- 1-With any size and complexity.
- 2-They are really useful.
- 3-They are used to structure all types of information(data already processed)
- 4-Specific purpose.

The data in a DB could be stored and maintained or used.

There are three main elements in a DB: **model**(how designed), **schema**(what can be stored) and **instances**(stored information).

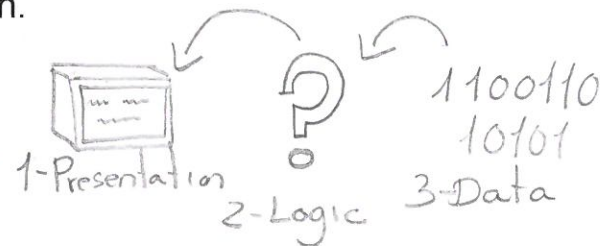
3 elements DB
- Model
- Schema
- Instances

Data modeling: process to create an abstract representation of the real-world in a DB. What is important there?

Data structure: Derived from the representation.

3-layer architecture

- 1- **Presentation tier**, what the user sees.
- 2- **Logic tier**, where the work happens.
- 3- **Data tier**, the DB itself.



Database Management Systems (DBMS).

They are a collection of programs that enables users to **create and maintain** a DB, they facilitate the process with the DBs. They have 4 steps:

- 1-Define the DBs, types, structures...
- 2-Constructing the DB storing the data
- 3-Manipulating like updating the DB
- 4-Sharing a DB with multiple users

They also give protection, they need maintenance and a response to a query. In essence, a DBMS allows users to create, maintain and exploit the information.

SQL Queries Exercises – Orders DB (1)

Retrieve...

1. All the information about the suppliers
(20 tuples)

2. The data about the products that are discontinued

productID	name	supplierID	categoryID	price	Stock	discontinued
5	Chef Anton's Gumbo Mix	2	2	21.35 €	0	Yes
9	Mishi Kobe Niku	4	6	97.00 €	29	Yes
17	Alice Mutton	7	6	39.00 €	0	Yes
24	Guaraná Fantástica	10	1	4.50 €	20	Yes
28	Rössle Sauerkraut	12	7	45.60 €	26	Yes
29	Thüringer Rostbratwurst	12	6	123.79 €	0	Yes
42	Singaporean Hokkien Fried Mee	20	5	14.00 €	26	Yes

3. The name, price, and stock of the discontinued products whose price is greater than 100€.

name	price	stock
Thüringer Rostbratwurst	123.79 €	0

4. The orders that are less than 13 years old (hint: check what the YEAR and the DATE functions are used for)
(13 tuples)

country
Austria
Denmark
Germany

5. The countries to which some order has been shipped (without repetitions and ordered alphabetically) delivered by transporter 3 and managed by employee 4.

6. The name and the price of the five most expensive products of category 8, descendingly by price (hint: check the TOP operator)

name	price
Carnarvon Tigers	62.50 €
Ikura	31.00 €
Gravad lax	26.00 €
Nord-Ost Matieshering	25.89 €
Inlagd Sill	19.00 €

7. The contact person and the phone number of the customers that don't have fax.

contactPerson	telephone
Antonio Moreno	(5) 555-3932
Pedro Afonso	(11) 555-7647
Helen Bennett	(198) 555-8888
Philip Cramer	0555-09876
Jaime Yorres	(415) 555-5938
Alexander Feuer	0342-023176
Michael Holz	0897-034214
Jose Pavarotti	(208) 555-8097

SQL Queries Exercises – Orders DB (2)

Retrieve...

1. The ID, name, price and final price (price + VAT: 21%) of all the products

(41 tuples; excerpt below)

productID	name	price	final_price
3	Aniseed Syrup	10.00 €	12.1
5	Chef Anton's Gumbo Mix	21.35 €	25.8335
7	Uncle Bob's Organic Dried Pears	30.00 €	36.3
8	Northwoods Cranberry Sauce	40.00 €	48.4

2. For each order, its ID, the customer, the employee, the order date, the delivery date, and the difference between these two dates (hint: use the DATEVALUE function)

(55 tuples; excerpt below)

orderID	customer	employee	orderDate	deliveryDate	delivery_time
10252	SUPRD		4/06/07/2009	21/07/2009	15
10255	RICSU		9/09/07/2009	27/07/2009	18
10258	ERNSH		1/14/07/2009	01/08/2009	18

3. The name, year of birth, and number of days worked for the company of each employee

name	birth_year	days_worked
Nancy	1968	10150
Andrew	1952	10411
Janet	1971	10546
Margaret	1958	9783
Steven	1955	9616
Michael	1961	9616
Robert	1961	9539
Laura	1958	9477
Anne	1969	9222
Lynn	1975	7349

4. All the data of the customers ordered by country
(36 tuples)

5. The name, surname, country, city, and postcode of the employees ordered alphabetically by country and by city within each country, and by postcode if there are several offices in a city, from highest to lowest postcode

name	surname	country	city	postcode
Steven	Buchanan	USA	Kirkland	SW1 8JR
Janet	Leverling	USA	Kirkland	98033
Anne	Dodsworth	USA	Redmond	WG2 7LT
Michael	Suyama	USA	Redmond	EC2 7JR
Margaret	Peacock	USA	Redmond	98052
Nancy	Davolio	USA	Seattle	98122
Laura	Callahan	USA	Seattle	98105
Lynn	Smith	USA	Tacoma	RG1 9SP
Robert	King	USA	Tacoma	RG1 9SP
Andrew	Fuller	USA	Tacoma	98401

6. The customer, order date, shipping cost, and country of the orders whose shipping costs are greater than 200€, ordered by order date

customer	orderDate	shippingCost	country
SAVEA	05/10/2009	214.27 €	USA
SEVES	18/11/2009	288.43 €	UK
EASTC	25/04/2011	278.96 €	UK
ERNSH	02/05/2011	258.64 €	Austria

7. The name and stock of the four products with the highest stocks, in order from highest to lowest stock

name	stock
Boston Crab Meat	123
Geitost	112
Inlagd Sill	112
Sasquatch Ale	111

8. The customer and order date of the orders in July (hint: use the MONTH function)

customer	orderDate
SUPRD	06/07/2009
RICSU	09/07/2009
ERNSH	14/07/2009
ERNSH	20/07/2009

9. For how many customers we don't know their province

Properties of the relations

- Each relation has a name and it's different from the name of all the others
- Attribute values are atomic: in each tuple, each attribute takes only one value
- There are no two attributes in a table with the same name
- The order of the attributes does not matter: the attributes aren't sorted
- There are no duplicated tuples
- The order of the tuples doesn't matter: the tuples aren't ordered

Primary Key: Is the main identifier

Foreign Key: Refer the content of a table to another

ER2Rel transformation algorithm

Each entity into a table and each attribute into a column.

One-to-one relationships

- >(1,1) to (1,1), FK in one table, no null values allowed.
- >(1,1) to (0,1), FK in one table, no null values allowed.
- >(0,1) to (0,1), FK in one table, null values allowed.

One-to-many relationships

- >(1,N) to (1,1), FK in (1,N), no null values allowed.
- >(1,N) to (0,1), FK in (1,N), no null values allowed.

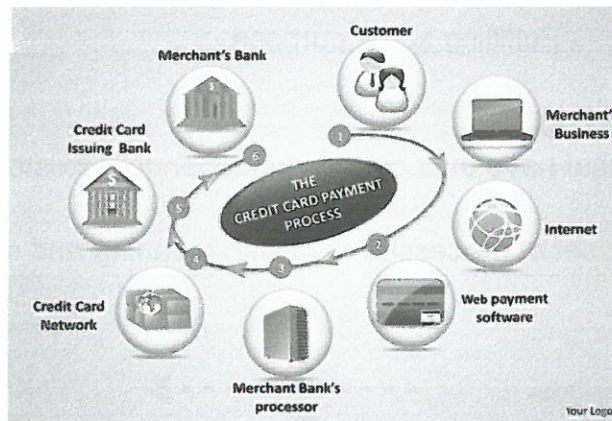
Many-to-many relationships

Added a new table. PKs are the PK of each first table. New attributes

¿SQL?

Information System Types (by the type of service)

- Transaction Processing Systems (TPS):
 - Can be divided into individual invisible operations (transactions).
 - It succeeds or fails as a whole.
- Expert Systems:
 - Mimics the behaviour of a human solving a problem.
 - Store expert knowledge to solve a problem by logical deduction.
- Credit Card Payment:



DSS

Decision maker, resolve

Decision Support Systems(DSS):

-Interactive IS for decision makers, obtaining, analysing... helping to identify and resolving problems.

ERP

Helps companies for their execution. Automate

Enterprise Resource Planning(ERP):

-Supports the execution of the main operational and business processes of a company.

CMS

Gives levels of hierarchy

Content Management Systems (CMS):

-IS that provides capabilities for multiple users with different permission levels to manage all or one content section, data...

OIS

App facilitate work

Office Information Systems(OIS):

-Set of applications to facilitate the usual work in an office, to make it more effective and efficient.

Geo

Analyse, store and visualise

Geographic Information Systems:

-IS that analyse, store, and visualise geographic information, usually on a map.

Green Computing:

Environmentally efficient operation, improves the environment.

Customer relationship Management

Compares cookies

Information Systems Introduction

Unit 1

What's a system?

System: "a set of things working together as part of a mechanism"

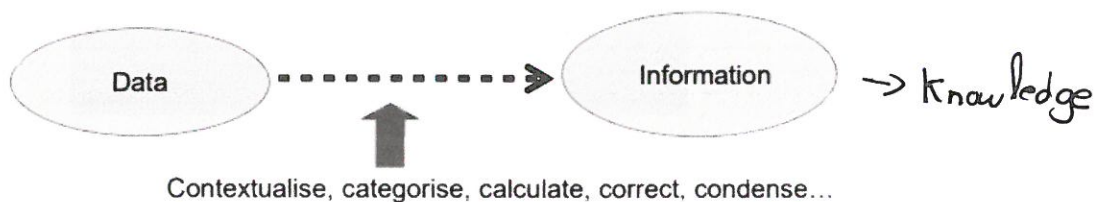
· It interacts with the environment.

- Taking input (data...)
- Producing output (information...)
- Fulfilling some purpose.

Data and information

Data: facts, that have their own and independent existence, in isolation they aren't relevant.

Information: set of processed data with meaning and relevance.



This transformation is a process, it must be useful and relevant to **contribute knowledge**.

Systems are designed to process, store and collect information to support operations, management and decision making of the organisation of which it is a part of.

Functions of an IS

- **Memory:** to maintain an internal representation of the state, necessary for other functions.
- **Informative:** to provide information about the state.
- **Active:** to perform actions that change the state.

Modes of an IS

- **On request:** when an IS performs an action to respond to a user request.
- **Autonomous:** when an IS performs a function on its own.

SQL Queries Exercises – Orders DB (4)

Using the DB resulting from the third document...

Retrieve...

1. The number of suppliers from each country

country	NumberOfSuppliers
Australia	1
Brazil	1
France	1
Germany	3
Italy	1
Japan	2
Norway	1
Singapore	1
Spain	1
Sweden	2
UK	2
USA	4

2. How many employees there are in each province for each position

province	position	amount
UT	Coordinator	1
UT	Sales Representative	2
WA	Inside Sales Coordinator	1
WA	Sales Manager	1
WA	Sales Representative	4
WA	Vice President, Sales	1

3. The ID of the five products that have been ordered a highest number of times and the number of times that they have been ordered, in ascending order of the ID

productID	numberOfOrders
16	7
24	5
31	8
35	5
41	6

4. Same as for the previous exercise but showing the name of the product

productID	name	numberOfOrders
16	Pavlova	7
24	Guaraná Fantástica	5
31	Gorgonzola Telino	8
35	Steeleye Stout	5
41	Jack's New England Clam Chowder	6

5. The cities where products have been ordered more than once, the ID of the products, and the number of times that each product has been ordered

city	productID	timesOrdered
Barquisimeto	26	2
Boise	35	2
Graz	5	2
Graz	16	2
Graz	41	2
Toulouse	24	2
Toulouse	36	2

6. The name of the company, the name of the category, and the total expense of the customers that have spent over 1000€ on condiments

companyName	name	totalExpense
Ernst Handel	Condiments	6,422.10
Save-a-lot Markets	Condiments	3,512.00

