IT102

Introduction to Databases

Welcome

- Dear Student,

- I would like to take the opportunity to welcome you to the School Nova IT102 class. Hopefully you had a great summer vacation, and feel excited to start a new school year.

- This semester you will learn the basics of data modeling, database design and Structured Query Language (SQL). We will use real life scenarios to model data, build and normalize tables and views and then operate on large amounts of data. For example, we will run reports from the Census Bureau database and learn how to identify trends from historical data.

- In the second semester we will combine our database skills with the technologies we learned in IT101 and create dynamic, data-driven three-tiered software applications.

- I am looking forward to another exciting journey into the world of computer technology, and hope that you do too!

Sincerely,

Serge Baduk

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What do I remember from last year?

- Please write the concepts you remember from last year:

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- *Hint: some of them start from letter "J"*

What is a database?

- A database is any organized collection of data. Some examples of databases you may encounter in your daily life are:
  - ◆ a telephone book
  - ◆ T.V. Guide
  - ◆ airline reservation system
  - ◆ motor vehicle registration records
  - ◆ papers in your filing cabinet
  - ◆ files on your computer hard drive.

- Why do people and organizations need databases?
- Keep records of their:
  - ◆ Clients
  - ◆ Staff
  - ◆ Volunteers

- To keep a record of activities and interventions;
- Keep sales records;
- Develop reports;
- Perform research

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Databases and Spreadsheets

- Databases are designed to offer an organized mechanism for storing, managing and retrieving information. They do so through the use of tables. If you're familiar with spreadsheets like Microsoft Excel, you're probably already accustomed to storing data in tabular form. It's not much of a stretch to make the leap from spreadsheets to databases.

- Just like Excel tables, database tables consist of columns and rows. Each column contains a different type of attribute and each row corresponds to a single record. For example, imagine that we were building a database table that contained names and telephone numbers. We would probably set up columns named "FirstName", "LastName" and "TelephoneNumber". Then we'd simply start adding rows underneath those columns that contained the data we're planning to store.

- At this point, you're probably asking yourself an obvious question - if a database is so much like a spreadsheet, why can't I just use a spreadsheet? Databases are actually much more powerful than spreadsheets in the way you're able to manipulate data. Here are just a few of the actions that you can perform on a database that would be difficult if not impossible to perform on a spreadsheet:

  - Retrieve all records that match certain criteria

  - Update records in bulk

  - Cross-reference records in different tables

  - Perform complex aggregate calculations

Homework

- Write a Java class that prints out "This program needs a database".

- Write a JavaScript loop that prints numbers from 1000 to 1.

- Create an HTML table that resembles this slide: two columns, four rows (including header). Make it look nice using style sheets.

- Think of an IT101 question you would like to ask next week. For example, something you forgot or did not understand last year.