

# COURSE FINAL PROJECT

Hi Tech Distribution Inc.

Assets Management System

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Course Number: 420-P34-AS

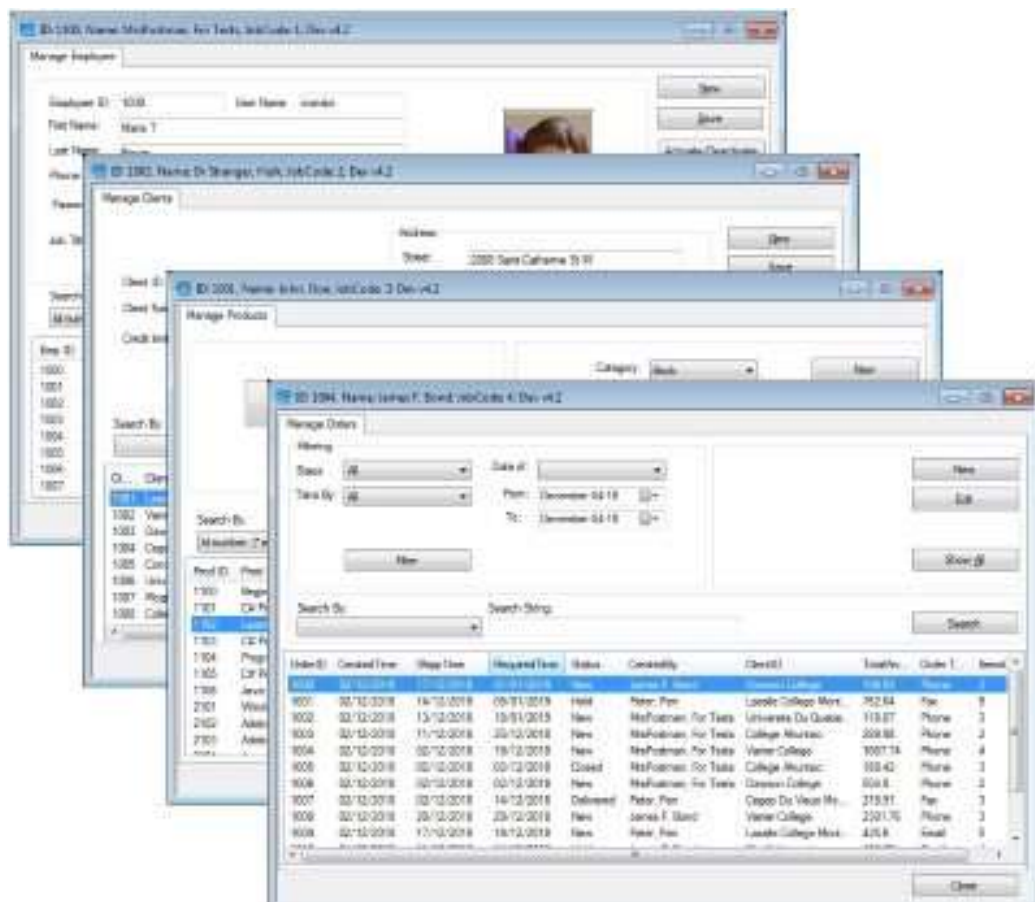
Course Title: Advanced Object Oriented Programming

Teacher: Quang Hoang Cao

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# Background information

**Hi-Tech Distribution Inc.** is supplying products (computer science books and softwares) to nearly all the colleges and universities in Quebec. You are required to design and implement a windows-based application named **Hi-Tech Management System** using Visual Studio 2015/2012, C#.

1. Each book record should contain the fields: ISBN, Title, UnitPrice, YearPublished and QOH (quantity on hand). Each book must be categorized. Each software must be categorized as well.
2. Each author record should contain the following pieces of information, for example, authorID (for identification in case authors have the same name), first name, last name.
3. **Hi-Tech** receives products from different publishers (suppliers): Premier Press, Wrox, Murach, Prentice Hall and more.
4. **Hi-Tech's** clients: Colleges and Universities in Quebec. Each college/university should contain the information such as name, street, city, postal code, phone number, fax number and credit limit (offered by **Hi-Tech** in the client's contract).
5. Order clerks can take clients' orders (by Phone, Fax, or Email) and order payments will be made by direct withdrawal from the college/university's bank account as specified in the contract between **Hi-Tech** and the client. The order shipping date will be based on the client's required date (e.g. one day before the required date).
6. At present, **Hi-Tech** has two order clerks who are responsible for taking the clients' orders.

# Project Structure:

Currently project consist of two (2) major modules:

- 1) Business:
  - a. Business Classes
  - b. Data Access classes
  - c. Validation classes
- 2) GUI (Forms)
  - a. Login
  - b. Manage accounts
  - c. Manage Authors
  - d. Manage Suppliers
  - e. Manage Orders
  - f. Manage Products Books
  - g. Manage Products Software

Business module resides in a separate project and must be compiled if one wants to make any changes and have this change available in the main program.

**FrmLogin** – is a STARTUP form, i.e. application compiled to start from this form.

**FrmManageAccount** – main application window. It has 4 different tabs according to the 4 job functions. One tab per one job function.

**FrmOrder** – this is additional form to display/edit/enter an Order information.

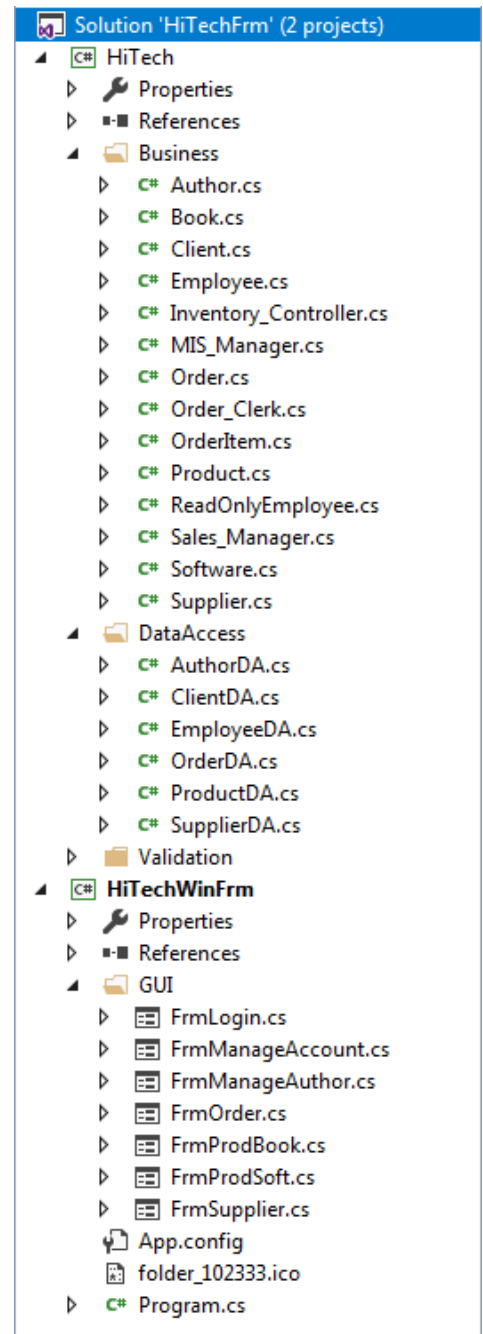
**FrmProdBook / FrmProdSoft** – a form to display/edit/enter a product information

**FrmManageAuthor** – a form to manage authors of the books

**FrmSupplier** – form to manage supplier's information

The following files are being used to save data, information, and configuration for accounts. These files are differed by format (TXT/XML):

Employees.dat	Employees' information, such as First and Last names, user name (used to login to the system), password (used to login, password are encrypted) and other information...
Clients.dat	Information related to the clients of the company
Authors.dat	Authors list – related to books products
Suppliers.dat	A list of suppliers for the company products (books and software)
Products.xml	An inventory of the company products: id, name, price ets. Since there are 2 different kind of products – software and books, an XML format chosen to be able to keep different information
Orders.xml	All orders save in XML format.



According to the requirements there are 4 different types of employees:

Users	Operations	These credentials could be used in the current configuration	
		User login	User password
<b>MIS Manager:</b> (Henry Brown)	<ul style="list-style-type: none"> <li>Save/update/delete employee information</li> <li>Search/list employee information</li> <li>Save/update/delete user information</li> <li>Search/List user information</li> </ul>	henryb	12345
<b>Sales Manager:</b> (Thomas Moore)	<ul style="list-style-type: none"> <li>Save/Update/Delete client information</li> <li>Search/List client information</li> </ul>	moore	123
<b>Inventory Controller:</b> (Peter Wang)	<ul style="list-style-type: none"> <li>Save/update/delete product information</li> <li>Search/List product information</li> </ul>	peterwang	123
<b>Order Clerks:</b> - Mary Brown	<ul style="list-style-type: none"> <li>Save/Update/Cancel clients' orders</li> <li>Search/List clients' orders</li> </ul>	marybro	123
- Jennifer Bouchard		bouchard	123

Use these credentials when log in to the system:

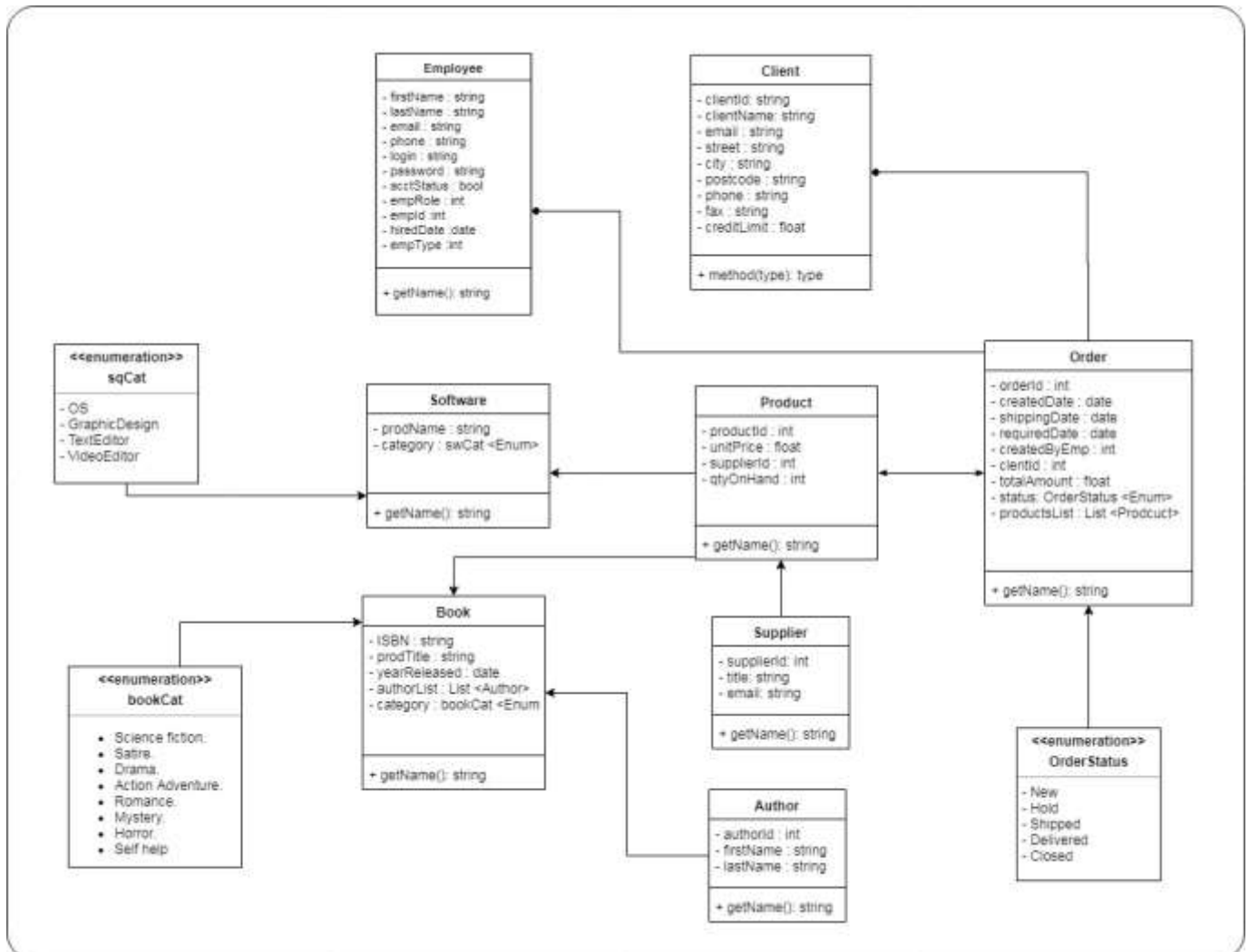
**Welcome to Hight Tech Distribution Inc.**

User Name:

Password:

# Classes Diagram overview

The diagram below represents project classes with its objects relations



# Selected Classes review

Some classes used:

**Employee** class – represents all company **Employees**. Child classes of the Employee parent class – these represents objects for different job functions employees:

Class name	Description
Employee	Parent class for all Employees account.
EmployeeDA	DataAccess class for class Employee – to provide access to data from client
MIS_Manager	Child class for Employee. Has its own job title
Sales_Manager	Child class for Employee. Has its own job title
Inventory_Controller	Child class for Employee. Has its own job title
Order_Clerk	Child class for Employee. Has its own job title
ReadOnlyEmployee	Child class for Employee. Has its own job title ( user object has not access)
Client	Parent class for all Clients objects
ClientDA	DataAccess class for class Client – to provide access to data from client
Product	Parent class for all Products objects
ProductDA	DataAccess class for class Product – to provide access to data from client
Order	Parent class for all Order objects
OrderDA	DataAccess class for class Order – to provide access to data from client
OrderItem	This class to create and manage items in the shopping cart of the order
Author	A class to create and manage authors of the product books
Supplier	A class to manage company's suppliers records
Validator	A class to keep validation functions. Provide validation help for any other classes when needed (example: isValidID – to check userID; isValidName – to check user name, isPhoneNumber – to check valid phone format)...

# Selected Functions, Methods review

Some functions (per class) used:

```

└─ Business
  └─ Author.cs
  └─ Book.cs
  └─ Client.cs
  └─ Employee.cs
  └─ Inventory_Controller.cs
  └─ MIS_Manager.cs
  └─ Order.cs
  └─ Order_Clerk.cs
  └─ OrderItem.cs
  └─ Product.cs
  └─ ReadOnlyEmployee.cs
  └─ Sales_Manager.cs
  └─ Software.cs
  └─ Supplier.cs
└─ DataAccess
  └─ AuthorDA.cs
  └─ ClientDA.cs
  └─ EmployeeDA.cs
  └─ OrderDA.cs
  └─ ProductDA.cs
  └─ SupplierDA.cs
└─ Validation
  └─ Validator.cs

SaveEmployee(Employee) : void
UpdateRecord(Employee) : void
isDuplicate(int) : bool
isDuplicateUser(string) : bool
SearchEmployee(int) : Employee
SearchRecord(string, string) : List<Employee>
ListAllRecords() : List<Employee>
isLoginPwOfEmp(string, string) : bool
isPowerEmp(string) : int
getEmp(string, string) : Employee
isValidId(string, int) : bool
isValidUser(string) : bool
isValidName(string) : bool
setNameStr(string) : string
NextEmpId(List<Employee>) : int
Employee()
Employee(string, string)
DecodeEmpJobCode(int) : string
  
```

```

EmployeeDA
  filePath : string
  tempFilePath : string
  SaveRecord(Employee) : void
  SaveRecord(Employee, string) : bool
  isDuplicateId(int) : bool
  isDuplicateUser(string) : bool
  SearchRecord(int) : Employee
  isLoginPwOfEmp(string, string) : bool
  isPowerEmp(string) : int
  getEmp(string, string) : Employee
  SearchRecord(string, string) : List<Employee>
  ListAllRecords() : List<Employee>
  UpdateRecord(Employee) : bool
  DecodeEmpJobCode(int) : string
  isValidId(string, int) : bool
  isValidUser(string) : bool
  isValidName(string) : bool
  setNameStr(string) : string
  NextEmpId(List<Employee>) : int

C# OrderDA.cs
OrderDA
  filePath : string
  tempFilePath : string
  filePathXML : string
  tempFilePathXML : string
  SaveAllProducts(List<Order>) : void
  XMLLoadAllProducts() : List<Order>
  isValidId(string, int) : bool
  SearchXMLRecordProd(int) : Order
  SearchXMLRecordProd(string, string) : List<Order>
  NextObjId(List<Order>) : int
  isDigit(string) : bool
  isDuplicate(int) : bool

C# ProductDA.cs
ProductDA
  filePath : string
  tempFilePath : string
  filePathBin : string
  tempFilePathBin : string
  filePathXML : string
  tempFilePathXML : string
  SaveRecord(Product) : bool
  SaveRecord(Product, string) : bool
  SaveAllProducts(List<Product>) : void
  XMLLoadAllProducts() : List<Product>
  isDuplicateId(int) : bool
  isValidId(string, int) : bool
  SearchXMLRecordProd(int) : Product
  SearchXMLRecordProd(string, string) : List<Product>
  ListAllRecords() : List<Product>
  UpdateRecord(Product) : bool
  NextObjId(List<Product>) : int
  isDialt(strina) : bool
  
```



# Working with system, screen shots

First things first you have to an account to be able login to the system.

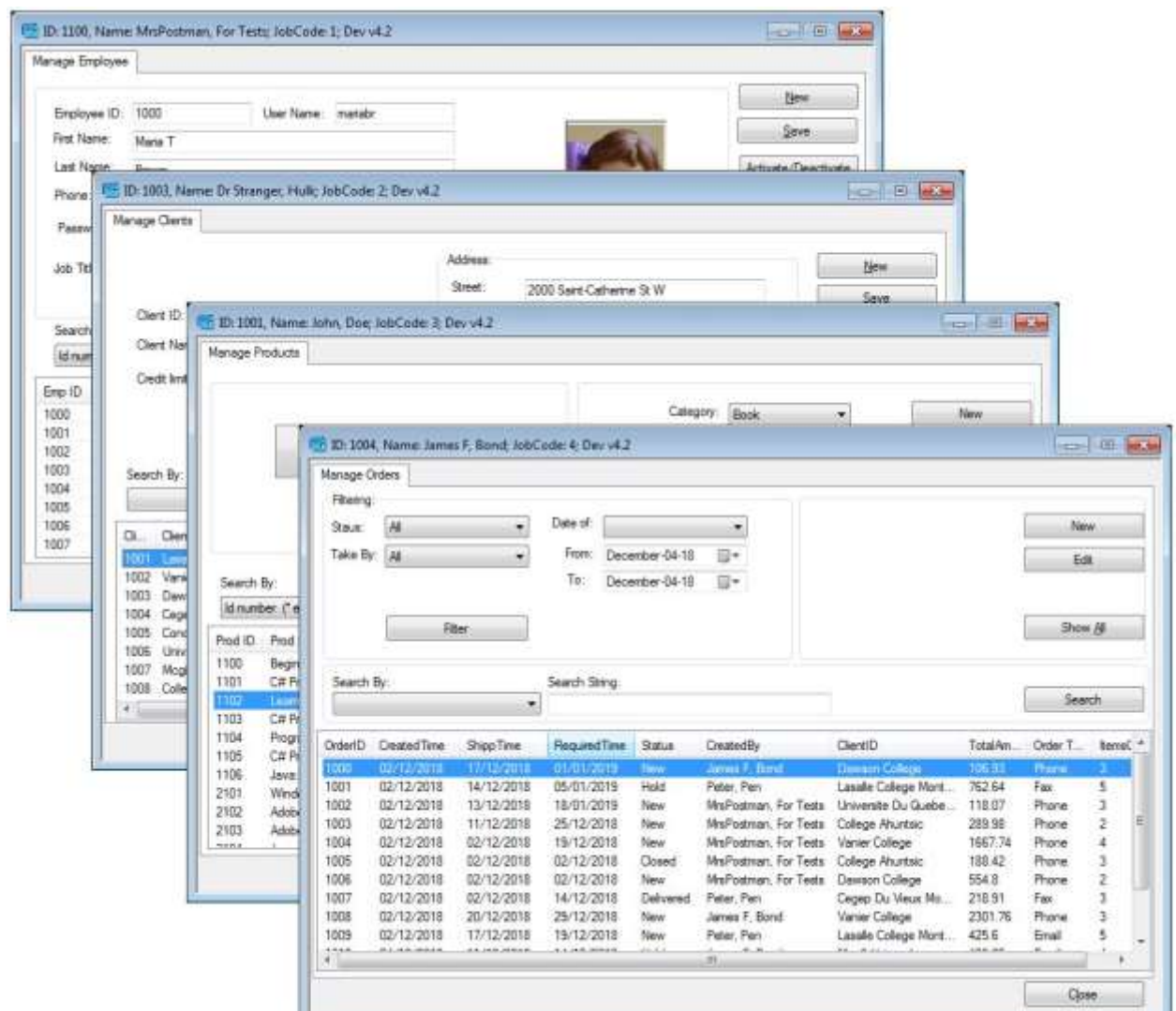
You can also use test account (Manager Access):

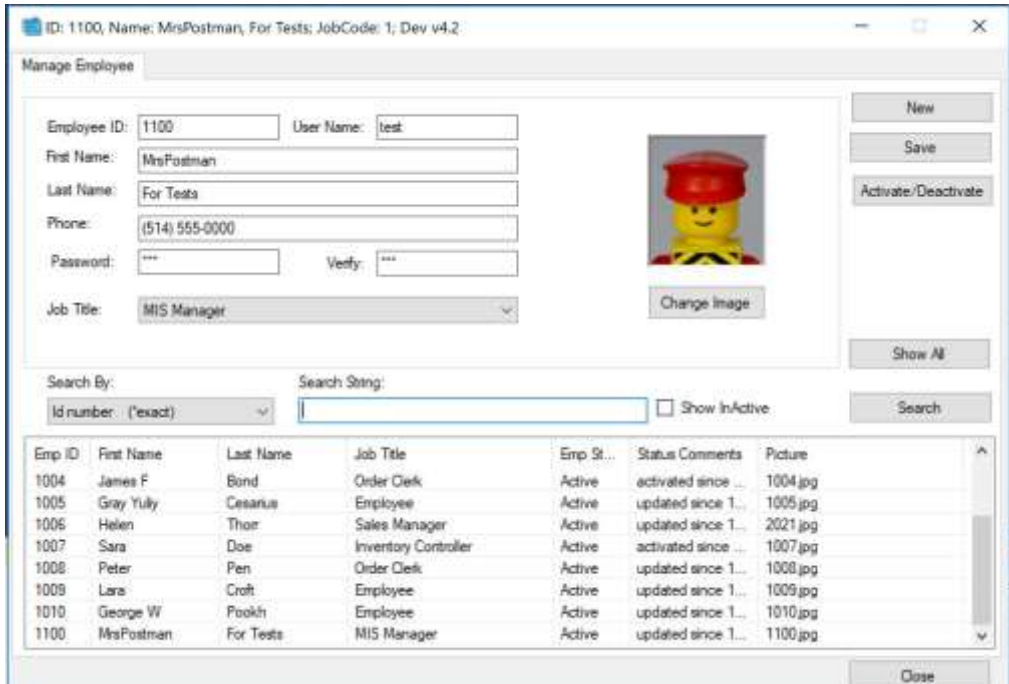
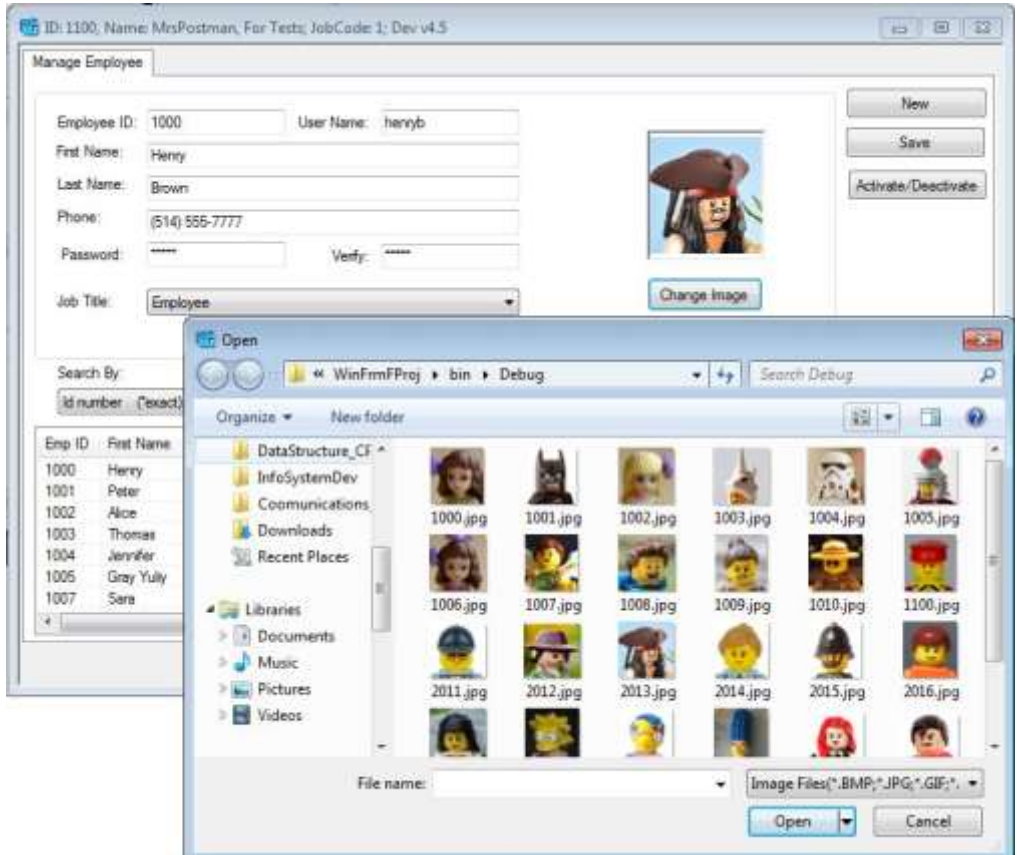
User name: test

User password: 123

To login to the system with test account and be able to manage user and users credentials.

General overview of all 4 tabs per 4 employee types (job functions):



<b>Job function</b>	<b>Screen / Program Tab</b>
<b>MIS Manager</b>	<div><b>Employees Management screen:</b> Here you can Add/Modify/Activate and Deactivate an employee</div> <div></div>
	<div><b>It is possible to change a picture (photo, image) for an employee account:</b></div> <div></div>

**Sales  
Manager**

**Manage clients**

Employee with job function "Sales Manager" with the following tab:

ID: 1000, Name: Maria T. Brown; JobCode: 2; Dev v4.2

**Manage Clients**

Client ID: 1001  
 Client Name: Lasalle College Montreal  
 Credit limit: 4322.99

Address:  
 Street: 2000 Saint-Catherine St W  
 City: Montreal  
 Postal code: H3H 2T3  
 Phone: 514-939-2006  
 Fax: 514-939-2006  
 Email: montreal@gmail.com

New  
 Save  
 Activate/Deactivate  
 Show All  
 Search

Search By: Search String:  ☐ Show InActive

Cl.	ClientName	Status	Comments	Street	City	PostCode	Phone	Fax	Email	Cre
1001	Lasalle College	Active	Changed 12...	2000 Saint-Cath...	Montreal	H3H 2T3	514-939	514-939	montrea...	4322
1002	Vanier College	Active	Changed 11...	821 Sainte Croix...	Montreal	J4K2R1	514-744	514-744	info@v...	3332
1003	Dawson College	Active	Changed 11...	3040 Sherbrook...	Montreal	H3Z1A4	514-931	514-931	admins...	4567
1004	Cegep Du Vieux...	Active	Changed 11...	255 Ontario St E	Montreal	H2K 1X6	514-982	514-982	vieuxm...	4564
1005	Concordia Unive...	Active	Changed 11...	1455 Boulevard ...	Montreal	H3G 1M8	514-848	514-848	coe@c...	4567
1006	Universite Du Q...	Active	Changed 11...	405 Rue Sainte...	Montreal	H2L 2C4	514-987	514-987	registr...	2534
1007	Mcgill University	Active	Changed 11...	845 Sherbrooke...	Montreal	H3A 0G4	514-398	514-398	service...	6578
1008	College Ahuntsic	Active	Changed 11...	9155 St Hubert St	Montreal	H2M 1Y8	514-389	514-389	admin@...	4547

Close

**Inventory  
Controller**

**To manage company's Products list and also to manage the list of Authors and Suppliers:**

ID: 1001, Name: Peter, Wang; JobCode: 3; Dev v4.5

**Manage Products**

Manage Authors Manage Suppliers

Category: Book

New  
 Edit  
 Show All

Search By: Search String:  ☐ Show InActive Search

Prod ID	Prod Name (Title)	Prod Category	Status	Unit Price	Supplier Id	Qty On ...
1100	Beginning C#: Object-Oriented Progra...	Book	Inactive	55.99	O'Reilly Media	100
1101	C# Programming Yellow Book	Book	Active	35.99	CreateSpace In...	24
1102	Learn C# in One Day and Learn it Well	Book	Active	14.95	For Dummies	201
1103	C# Programming: Quickly Learn C# Pr...	Book	Inactive	35.6	For Dummies	34
1104	Programming PHP: Creating Dynamic ...	Book	Inactive	35.99	CreateSpace In...	34
1105	C# Programming Red Book	Book	Inactive	45.99	O'Reilly Media	24
1106	Java: The Complete Reference	Book	Active	51.05	CreateSpace In...	34
2101	Windows 10 Home Edition	Software	Active	135.99	For Dummies	34
2102	Adobe Photoshop CS 18	Software	Active	305.99	CreateSpace In...	56
2103	Adobe Photoshop CS 16	Software	Inactive	255.99	CreateSpace In...	6

Close

## Inventory Controller

### When creating a new product – like book:

ID: 1007, Name: Sara, Doe; JobCode: 3; Dev v4.2

Manage Products

Category: Book

New

Edit

Show All

Search

Qty On ...

100

24

201

34

34

24

34

34

56

6

Close

product ID: 1007

Book Title:

Book ISBN:

Year released:

Supplier:

Unit Price:

Qty On Hand:

Active

New

Category:

Authors:

Book Author(s):

Add

Remove

Clear

Item ID	Title	ISBN	Unit Price	Qty On ...	Category	Authors
1100	Beginning C#: Object-Oriented...	978-1-4...	55.99	100	Science...	Paul, Deitel
1101	C# Programming Yellow Book	B00HN...	35.99	24	Horror	Stephen, T...
1102	Learn C# in One Day and Le...	978-151...	14.95	201	Horror	Jon, Skeet;
1103	C# Programming: Quickly Le...	B01NH...	35.6	34	Horror	Harvei, Dei
1104	Programming PHP: Creating ...	978-144...	35.99	34	Action_...	Harvei, Dei
1105	C# Programming Red Book	B11HN...	45.99	24	Horror	Jon, Skeet

Save

Close

You can also edit existing product – just double click any product in the list of click <Edit> button to open the following window:

Add New Books

product ID: 1102

Book Title: Learn C# in One Day and Learn it Well

Book ISBN: 978-1518800276

Year released: 2015

Supplier: 1003, For Dummies

Unit Price: 14.95

Qty On Hand: 201

Active

New

Category: Horror

Authors:

Book Author(s): 1008, Jon, Skeet; 1009, Ben, Albahari

Add

Remove

Clear

Item ID	Title	ISBN	Unit Price	Qty On ...	Category	Authors	Year Pub	Supplier
1100	Beginning C#: Object-Oriented...	978-1-4...	55.99	100	Science...	Paul, Deitel	2013	1001
1101	C# Programming Yellow Book	B00HN...	35.99	24	Horror	Stephen, Teihet	2015	1002
1102	Learn C# in One Day and Le...	978-151...	14.95	201	Horror	Jon, Skeet; Ben, Albahari	2015	1003
1103	C# Programming: Quickly Le...	B01NH...	35.6	34	Horror	Harvei, Deitel; Stephen, Teihet	2016	1003
1104	Programming PHP: Creating ...	978-144...	35.99	34	Action_...	Harvei, Deitel	1995	1002
1105	C# Programming Red Book	B11HN...	45.99	24	Horror	Jon, Skeet	2016	1001
1106	Java: The Complete Reference	978-125...	51.05	34	Horror	Stephen, Teihet	2017	1002
2104	Java: A beginners Guide	978-0-0...	65.95	20	Text_B...	Andrew, Trostsen; Philip, Japikse; Stephen, Teihet	2014	1004

Save

Close

## Order Clerks

### **Manage Orders:**

You can Create new or Modify existing orders by login as “Order Clerk”. You will see the following window:

The screenshot shows the 'Manage Orders' window with the following details:

- Header: ID: 1004, Name: James F. Bond; JobCode: 4; Dev v4.2
- Filtering section: Status (Hold), Take By (All), Date of (All dates), From (December-04-18), To (Today: 04/12/2018). A calendar dropdown is open for the 'To' field.
- Buttons: New, Edit, Show All, Search, Filter.
- Table with columns: OrderID, CreatedTime, ShippTime, RequiredTime, Status, CreatedBy, ClientID, TotalAm..., Order T..., ItemsQty.
- Table data:

OrderID	CreatedTime	ShippTime	RequiredTime	Status	CreatedBy	ClientID	TotalAm...	Order T...	ItemsQty
1001	02/12/2018	14/12/2018	05/01/2019	Hold	Peter, Pen	Lasalle College Mont...	762.64	Fax	5
1010	24/12/2018	11/12/2018	14/12/2018	Hold	James F. Bond	Mcgill University	499.65	Email	4

## Order Clerks

Different filters could be used to display the orders, as well as search function to search for particular Order ID, Client Name or Employee name (Created by)

The screenshot shows the 'Manage Orders' window with the following details:

- Header: ID: 1101, Name: Mary, Brown; JobCode: 4; Dev v4.5
- Filtering section: Status (checked), Take By (checked), Date of (empty), From (December-04-18), To (December-04-18). Red checkmarks are present on the Status, Take By, and To fields.
- Buttons: New, Edit, Show All, Search, Filter.
- Search section: Search By (CreatedBy: Employee (First or Last name)), Search String (peter).
- Table with columns: OrderID, CreatedTime, ShippTime, RequiredTime, Status, CreatedBy, ClientID, TotalAm..., Order T..., ItemsQty.
- Table data:

OrderID	CreatedTime	ShippTime	RequiredTime	Status	CreatedBy	ClientID	TotalAm...	Order T...	ItemsQty
1001	02/12/2018	14/12/2018	05/01/2019	Hold	Peter, Pen	Lasalle College Mont...	762.64	Fax	5
1007	02/12/2018	02/12/2018	14/12/2018	Delivered	Peter, Pen	Cegep Du Vieux Mo...	218.91	Fax	3
1009	02/12/2018	17/12/2018	19/12/2018	New	Peter, Pen	Lasalle College Mont...	425.6	Email	5
1012	18/12/2018	19/12/2018	20/12/2018	New	Peter, Pen	Cegep Du Vieux Mo...	86.93	Email	2



## Order Clerks

An order can be modified by double clicking the order record in the list of orders. You should see the following:

Order created by Peter, Pen [ EmpID: 1008 ]

Order ID: 1001 For Client: 1001, Lasalle College Montreal

Created Time: December-02-18 Created By: Peter, Pen [ EmpID: 1008 ]

Shipping Time: December-14-18 Status: Hold

Required Time: January -05-19 Taken By: Fax

Order Cat: change the dates

Total Amount: 582.69

Prod ID	Prod Name (Title)	Prod Category	ItemQty	Status	Unit Price	Supp
1101	C# Programming Yellow Book	Book	1	Active	35.99	Creat
1104	Programming PHP: Creating Dynamic	Book	5	Inactive	35.99	Creat
1100	Beginning C# Object-Oriented Progra	Book	3	Inactive	55.99	O'Reil
1103	C# Programming: Quickly Learn C# Pr	Book	3	Inactive	35.6	For D
1105	C# Programming Red Book	Book	2	Inactive	45.99	O'Reil

Search By: Search String: Search

Prod ID	Prod Name (Title)	Prod Category	Status	Unit Price	Supplier Id
1100	Beginning C# Object-Oriented Progra	Book	Inactive	55.99	O'Reilly Media
1101	C# Programming Yellow Book	Book	Active	35.99	CreateSpace In
1102	Learn C# in One Day and Learn it Well	Book	Active	14.95	For Dummies
1103	C# Programming: Quickly Learn C# Pr	Book	Inactive	35.6	For Dummies
1104	Programming PHP: Creating Dynamic	Book	Inactive	35.99	CreateSpace In
1105	C# Programming Red Book	Book	Inactive	45.99	O'Reilly Media

Item: x 0

Save Close

Remove Add to Cart

how many?

- You can add products from the list of products to the "Order Cart" list, just double click the product from the list, or click <Add to Cart> button. Also you can change the quantity of the product item
- You can remove an item from the shopping card by clicking <Remove>

## Order Clerks

When you click <Save> - the order record will be updated. If this is existing order, you will get confirmation question. If this is new order there will be n questions.

Order created by Peter, Pen [ EmpID: 1008 ]

Order ID: 1012 For Client: 1004, Cegap Du Vieux Montreal

Created Time: December-18-18 Created By: Peter, Pen [ EmpID: 1008 ]

Shipping Time: December-18-18 Status: New

Required Time: December-20-18 Taken By: Email

Order Cart

Total Amount: 86.93

Prod ID	Prod Name (Title)	Prod Category	ItemQty	Status	Unit Price	Supplier
1102	Learn C# in One Day and Learn it Well	Book	1	Active	14.95	For Dums
1104	Programming PHP: Creating Dynamic	Book	2	Inactive	35.99	CreateSp

Search By: Search

Prod ID	Prod Name (Title)
1100	Beginning C# Object-Oriented Progra
1101	C# Programming Yellow Book
1102	Learn C# in One Day and Learn it Well
1103	C# Programming: Quickly Learn C# Pr
1104	Programming PHP: Creating Dynamic
1105	C# Programming Red Book

Item: 1102, Learn C# in One Day and Learn it Well, Book

Save Close

Remove Search

Add to Cart

Confirmation on Update

This ID is already in use: 1012

Do you want to update this Order information?

Yes No