LKS SMK
Tingkat Provinsi Bali 2018

KISI-KISI SOAL BIDANG LOMBA

IT SOFTWARE SOLUTIONS FOR BUSINESS

1. TECHNICAL/ COMPETITION DESCRIPTION (TD)

This competition is designed to test specialist users of software applications. The skill involves the ability to:

- Analyze system based on database modeling tools and techniques with Entity Relationship Diagram (ERD)
- Use investigation and learning skills to obtain user requirements (e.g., document search and analysis)
- Write a method given the desired behavior (inputs, outputs, pre-conditions and post-conditions).
- Use latest available integrated development environments and identify the strengths and weaknesses of each in software development
- Search for, evaluate and integrate appropriate libraries and frameworks into the software being developed
- Construct database structure and data dictionary
- Use the functionality of the .NET environment to develop the software solution according to requirements specifications
- Use the full potential of SQL Server to store and manage the data for the system to be developed
- Demonstrating the software solution developed to solve sample of business case given.

2. ANALYSIS TECHNICAL DESCRIPTION

Skills summary of technical/ competition description following:

1. Work Organization and Management
2. Communication and Interpersonal Skill
3. Problem Solving, Innovation and Creativity
4. Analyze and Designing Software Solution
5. Developing Software Solution
6. Testing Software Solution

Generally, those skills are divided into four major module of skill test:

No.	Module
1	Database Creation and Main Form Development
2	Master Form Development
3	Schedule Form Development
4	View Schedule and Score Development

3. COMPETITION SCENARIO

3.1 Opening Day and Competition Day 1

No.	Schedule	Activity
1	09.00	Opening Ceremony
2	13.00 – 13.30	Technical Briefing
3	13.30 – 14.00	Familiarization, Hardware and Software Checking
4	14.00 – 15.30	Module 1: Database Creation and Main Form Development
5	15.30 – 17.00	Marking

3.2 Competition Day 2

No.	Schedule	Activity
1	07.30 – 08.00	Preparation
2	08.00 – 09.30	Module 2: Master Form Development
3	09.30 – 11.00	Marking
4	11.00 – 11.30	Break
5	11.30 – 13.00	Module 3: Schedule Form Development
6	13.00 – 13.30	Break
7	13.30 – 15.00	Marking
8	15.00 – 16.30	Module 4: View Schedule and Score Development
9	16.30 – 18.00	Marking
10	18.00 – 19.00	Break and Competition Summary

3.3 Closing Ceremony and Winner Announcement

4. MARKING GUIDELINE

- Marking will be done after each module finished.
- Competitor that is capable to finish current module before submission time are permitted to start the next module.
- Competitors are not allowed to revise the submitted module after the submission time.
- Competitors are not allowed to bring any electronic and printed material to competition area.
- Jury is checking based on given check list. One checklist may contain more than one marking components. Missing or incorrect result on one of those components will be assumed as wrong answer.

- Marking Percentage :
  - Database Creation and Main Form Development : 18%
  - Master Form Development : 22%
  - Schedule Form Development : 30%
  - View Schedule and Score Development : 30%

5. FACILITIES

5.1 Hardware

The following machines and equipment will be made available to each competitor:

- Computer for each competitor:
  - Intel Core i3 4150, 3.50 Ghz
  - Hard disk 500GB
  - RAM 4 GB DDR3
  - Monitor LCD 18.5”
  - Keyboard, Mouse USB
- Document holder and stationary

5.2 Software

The following softwares will available for each computer system:

- Windows 10 64-bit operating system
- Microsoft Visual Studio Community Edition 2015
- SQL Server Express Management Studio 2014
- SQL Server 2014
- PDF Reader
- Microsoft Office 2013
- .(dot) net framework 4.5

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IT SOFTWARE SOLUTIONS FOR BUSINESS

Denpasar, 8-10 Maret 2018

PROJECT OVERVIEW

In this Test Project, you are required to develop an information system following the requirement given on the Test Project. In general, there will be 4 project resources given to you, which is:

1. **ERD and Data Dictionary for Test Project**

   This will be used to guide you to create the database files. Ensure that all entities created on the database are related with the given ERD, following the relationship and also the criteria in Data Dictionary for each entity!

2. **Navigation Diagram for the Application**

   Use the Navigation Diagram to develop the form interaction inside the application. You are free to add new interaction between forms, without neglecting the defined interaction in this diagram.

3. **Example Design (Wireframe) of desired Information System**

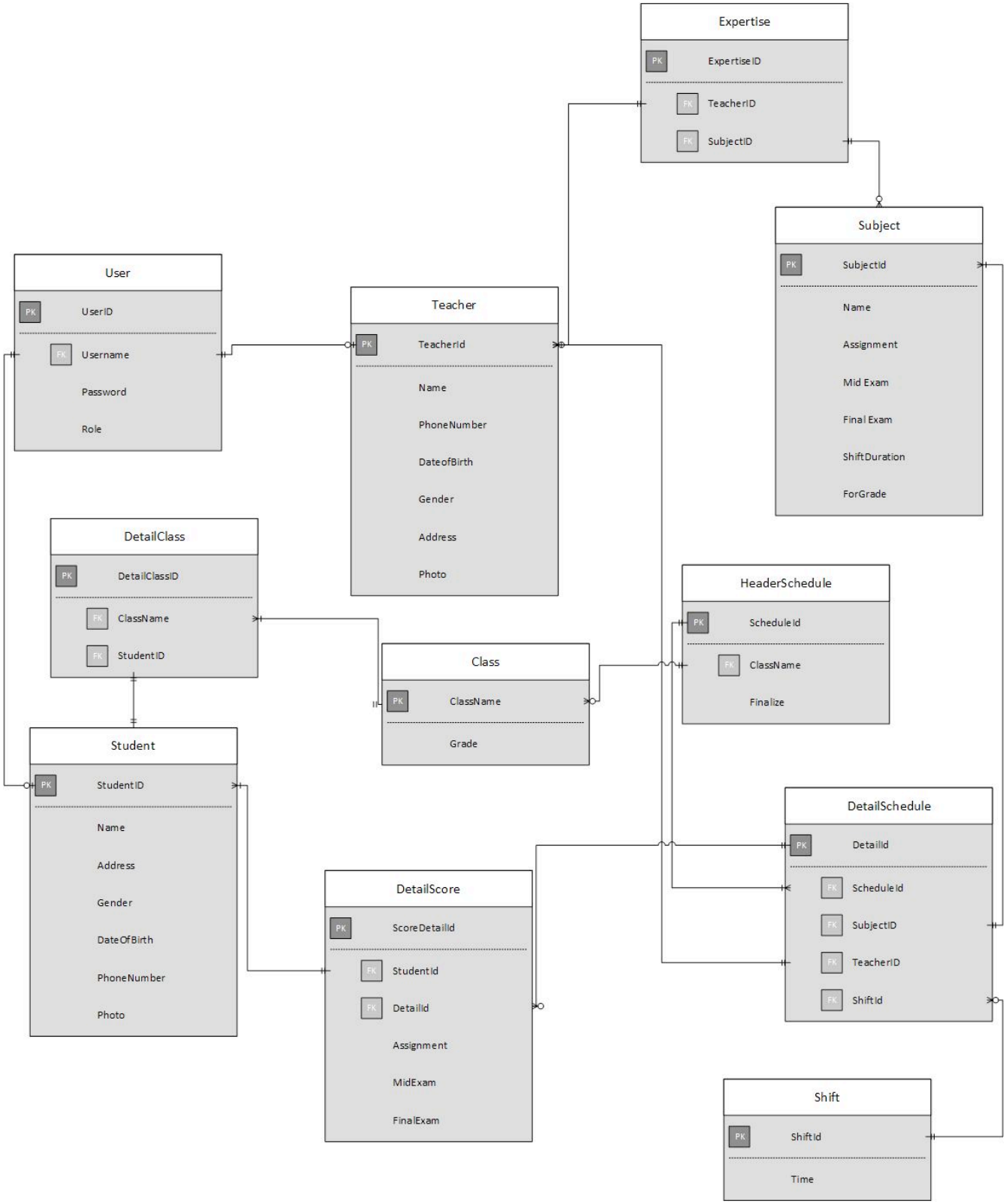
   This file is used to give you design guidelines of all required forms. Please note that your form designs are not limited to these examples!

4. **Data files (*if any*)**

   The data files will be used to support you test and develop the information system on each module. Please use this data files in the development, you are allowed to use another resources outside the given data files only if instructed in the module.

SMK NUSANTARA INFORMATION SYSTEM

ENTITY RELATIONSHIP DIAGRAM



SMK NUSANTARA INFORMATION SYSTEM

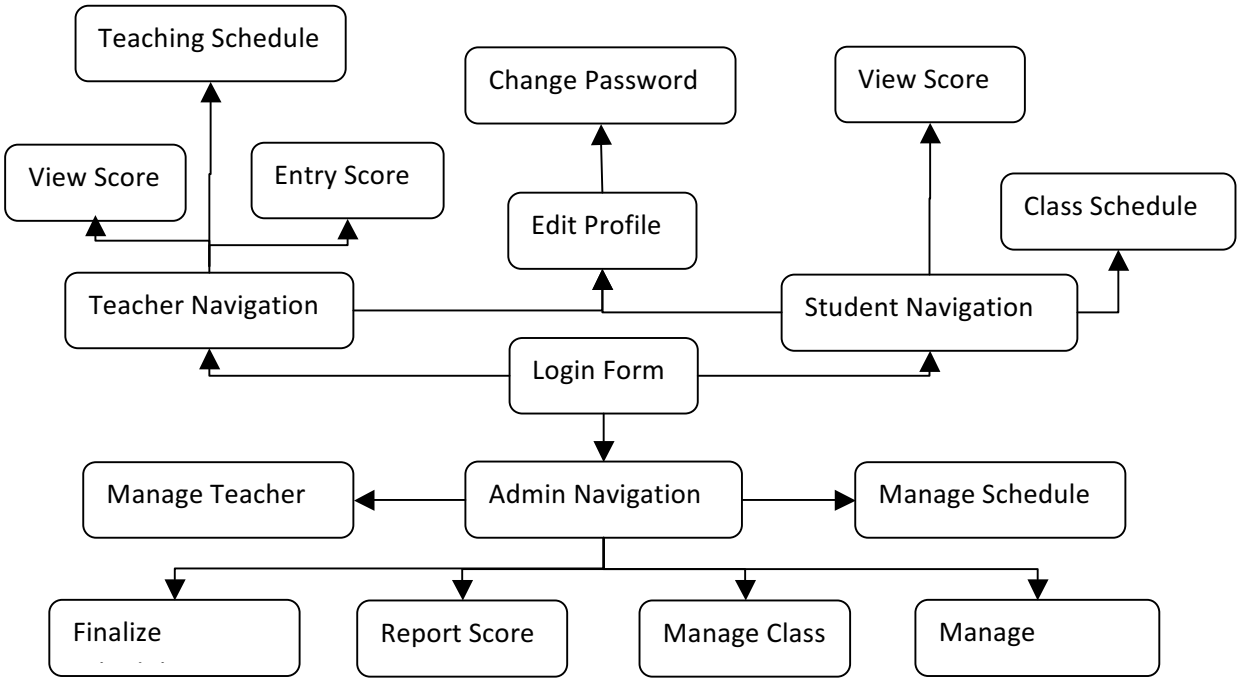
DATA DICTIONARY

Tabel	KEY	Kolom	Tipe Data	Required?	Notes
Teacher	PK	TeacherID	VARCHAR(8)	Y	
		Name	VARCHAR(50)	Y	
		PhoneNumber	VARCHAR(12)	Y	
		DateofBirth	Date	Y	
		Gender	VARCHAR(7)	Y	
		Address	VARCHAR(100)	Y	
		Photo	VARCHAR(100)	N	
Subject	PK	SubjectID	CHAR(5)	Y	
		Name	VARCHAR(50)	Y	
		Assignment	INTEGER	Y	
		Mid Exam	INTEGER	Y	
		Final Exam	INTEGER	Y	
		ShiftDuration	INTEGER	Y	
		Grade	INTEGER	Y	
Class	PK	ClassName	VARCHAR(5)	Y	
		Grade	INTEGER	Y	
Student	PK	StudentID	VARCHAR(8)	Y	
		Name	VARCHAR(50)	Y	
		Address	VARCHAR(150)	Y	
		Gender	VARCHAR(7)	Y	
		DateofBirth	DATE	Y	
		PhoneNumber	VARCHAR(12)	Y	
		Photo	VARCHAR(100)	N	
User	PK	Userid	INTEGER	Y	Auto Increment
	FK	Username	VARCHAR(8)	Y	
		Password	VARCHAR(10)	Y	
		Role	VARCHAR(8)	Y	
HeaderSchedule	PK	ScheduleID	INTEGER	Y	Auto Increment
	FK	ClassName	VARCHAR(5)	Y	
	FK	Finalize	INTEGER	Y	
DetailSchedule	PK, FK	DetailID	INTEGER	Y	Auto Increment
	FK	ScheduleID	INTEGER	Y	
	FK	SubjectId	CHAR(5)	Y	
	FK	TeacherId	VARCHAR(8)	Y	
	FK	ShiftId	INTEGER	Y	
		Day	CHAR(10)	Y	
Shift	PK	ShiftId	INTEGER	Y	
		Time	CHAR(13)	Y	
DetailScore	PK	ScoreDetailId	INTEGER	Y	Auto

					Increment
	FK	DetailId	INTEGER	Y	
	FK	StudentId	VARCHAR(8)	Y	
		Assignment	INTEGER	N	
		MidExam	INTEGER	N	
		FinalExam	INTEGER	N	
DetailClass	PK	DetailClassId	INTEGER	Y	Auto Increment
	FK	ClassName	VARCHAR(5)	Y	
	FK	StudentId	VARCHAR(8)	Y	
Expertise	PK	ExpertiseId	INTEGER	Y	Auto Increment
	FK	TeacherId	VARCHAR(8)	Y	
	FK	SubjectId	CHAR(5)	Y	

SMK NUSANTARA INFORMATION SYSTEM

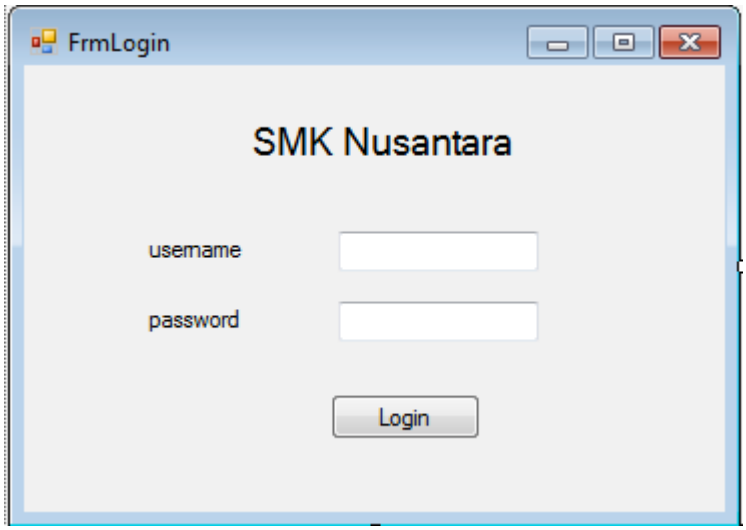
NAVIGATION DIAGRAM



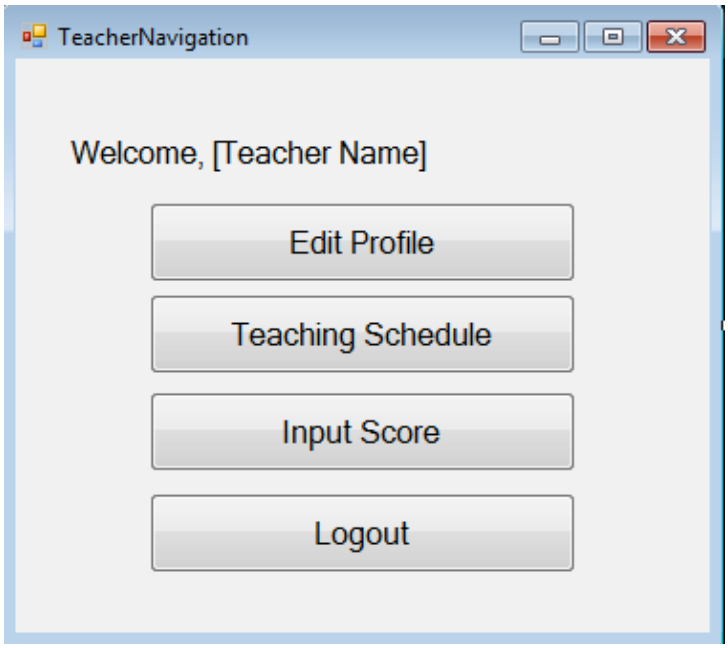
SMK NUSANTARA INFORMATION SYSTEM

WIREFRAME

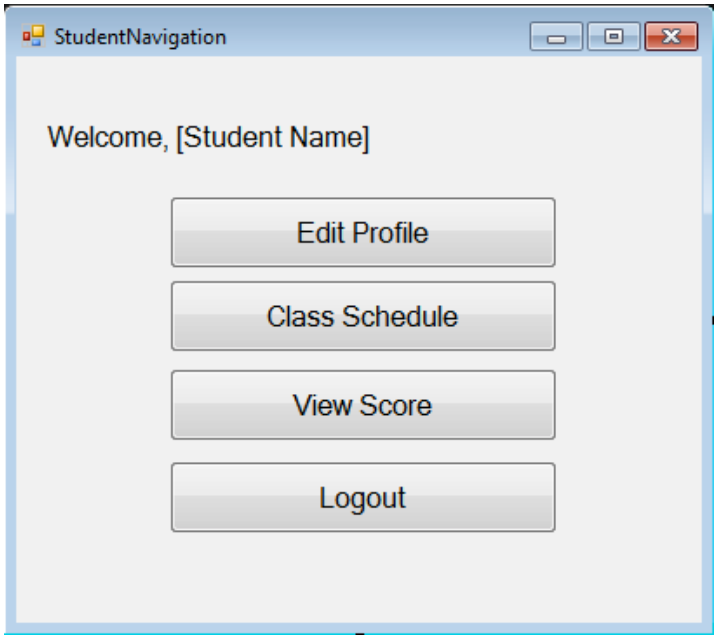
01 Login Form



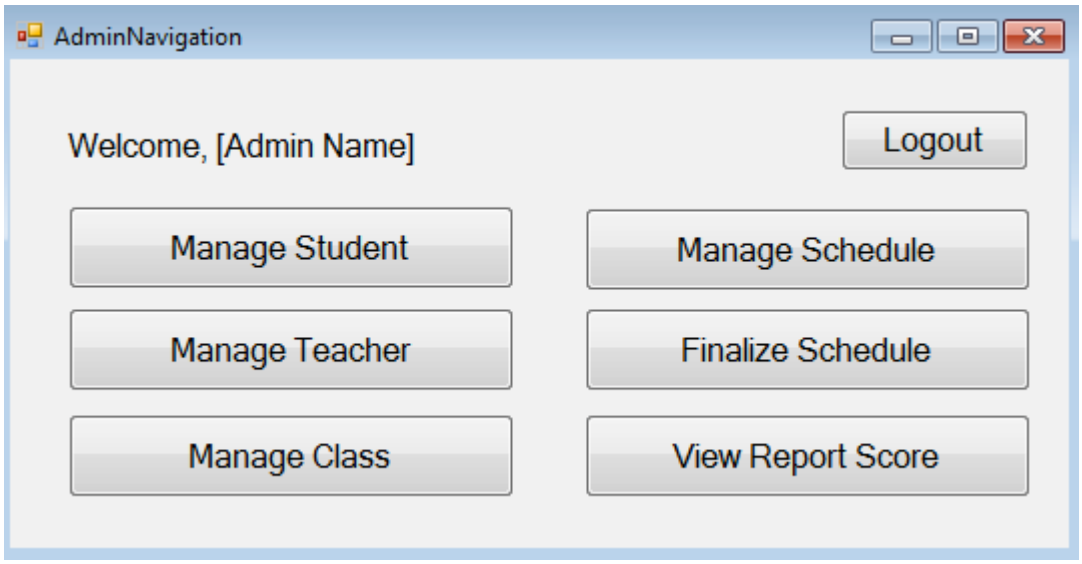
02 Teacher Navigation Form



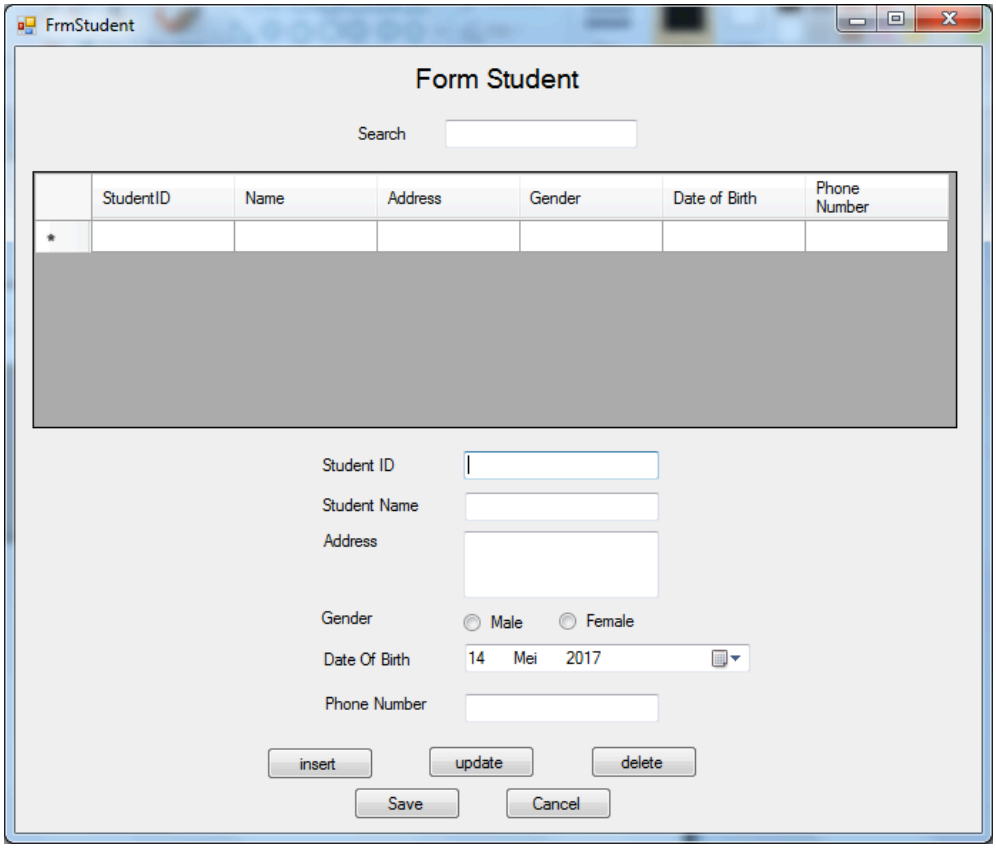
03 Student Navigation Form



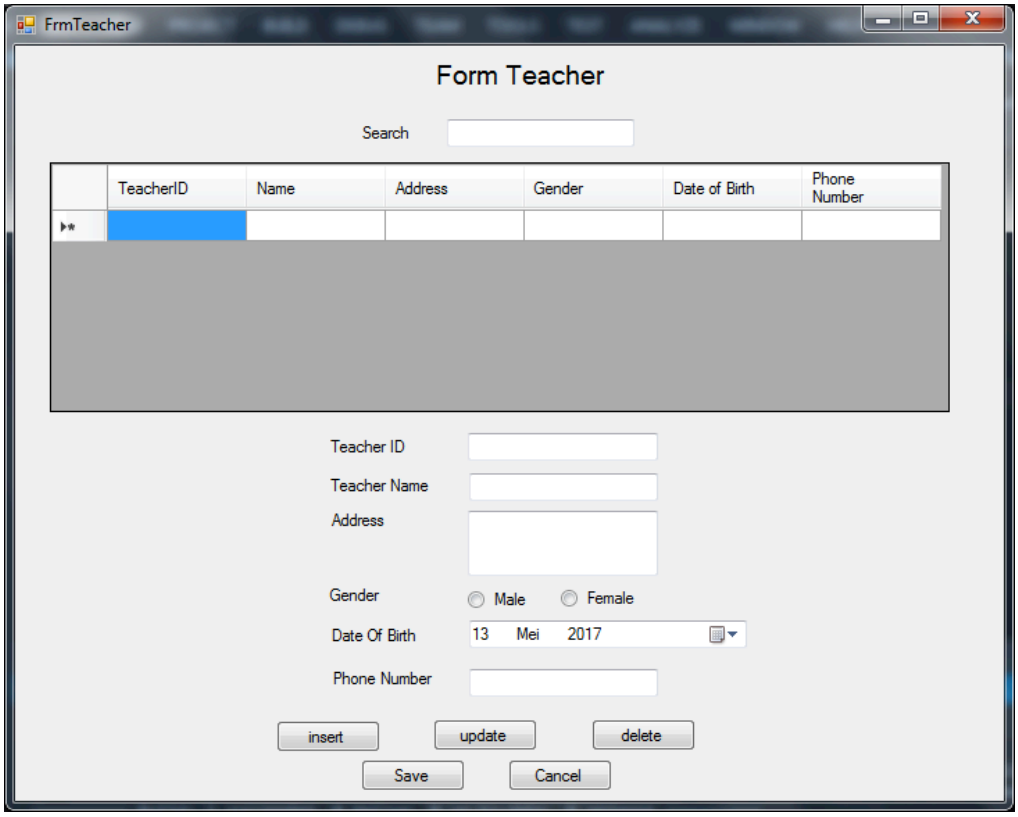
04 Admin Navigation Form



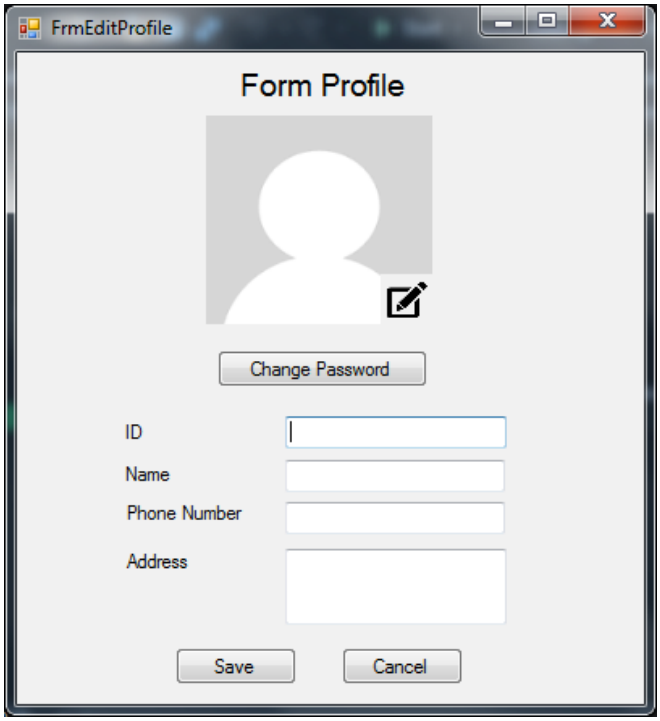
05 Manage Student Form



06 Manage Teacher Form

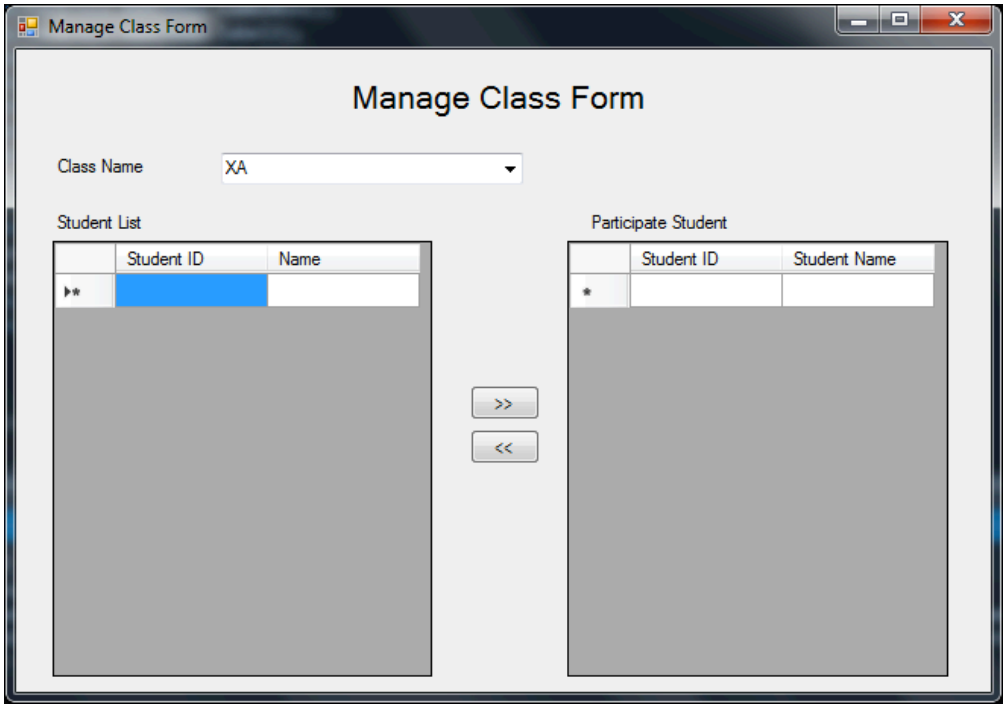


07 Edit Profile Form

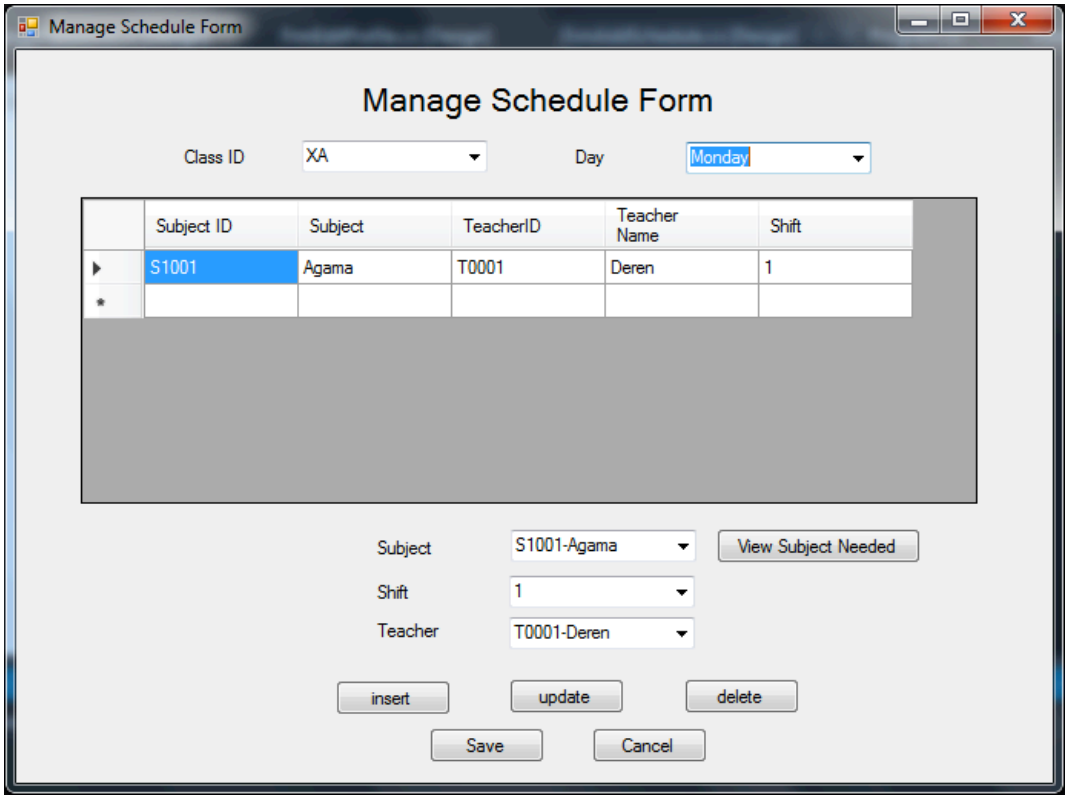


08 Change Password Form

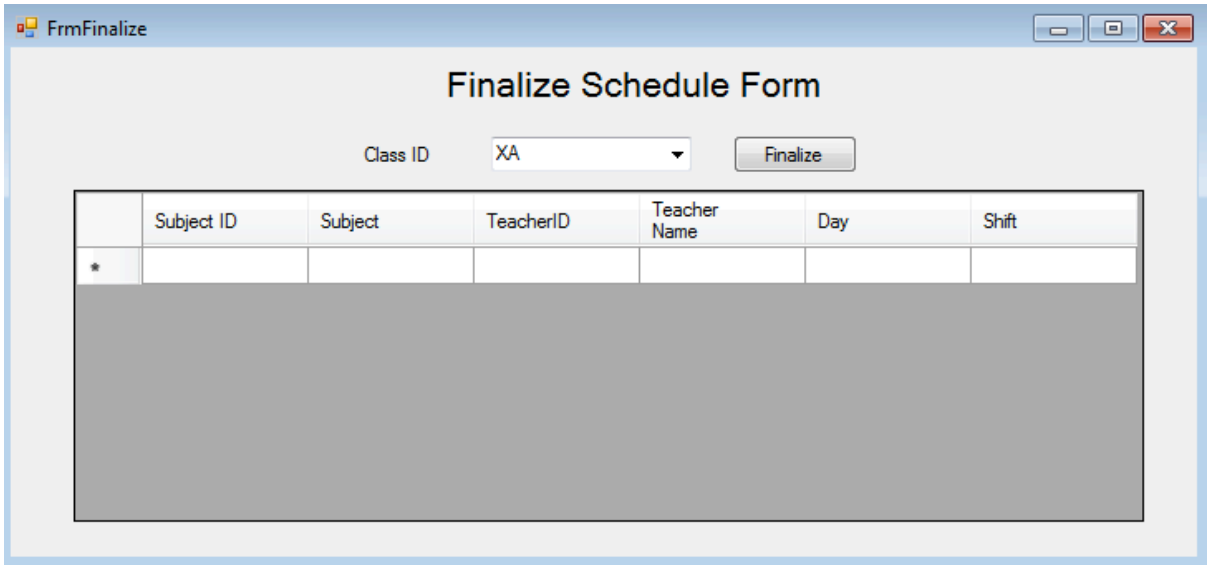
09 Manage Class Room



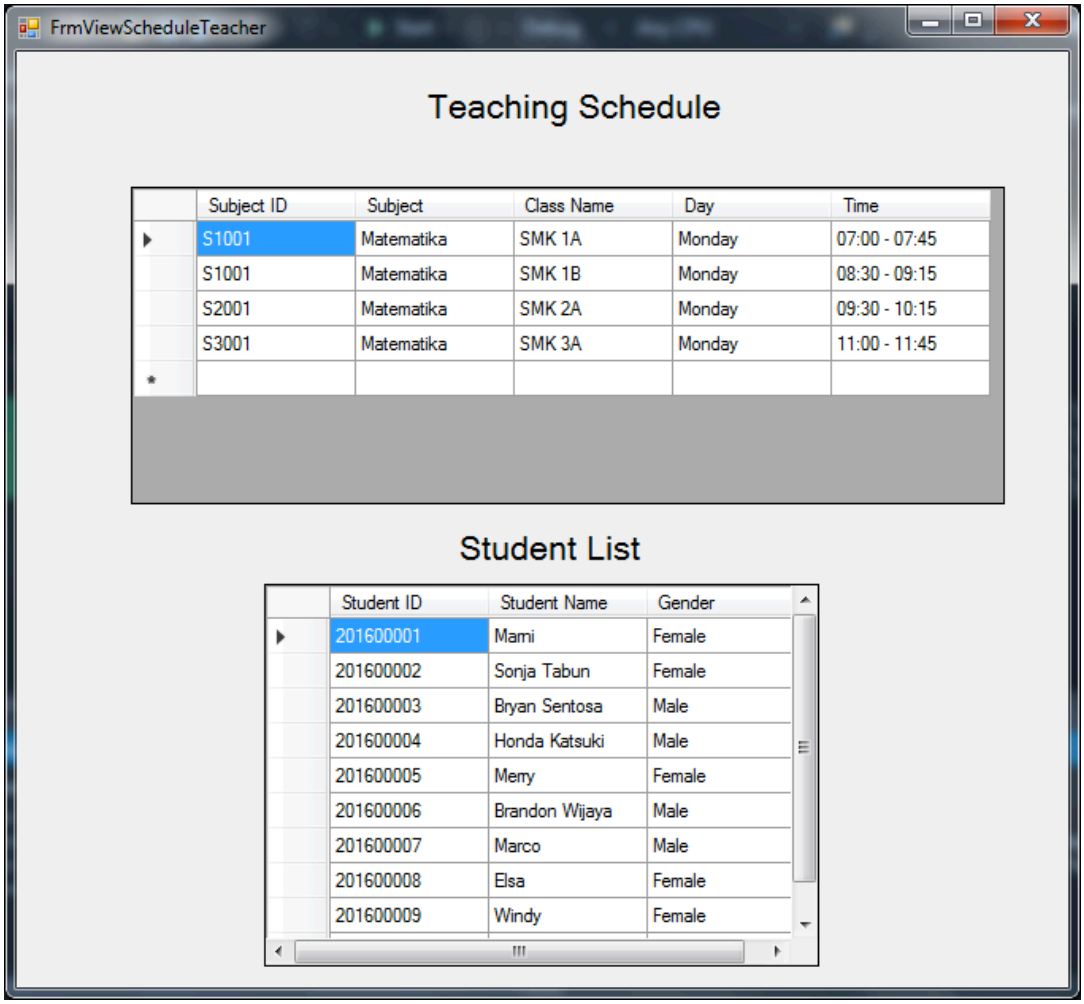
10 Manage Schedule Form



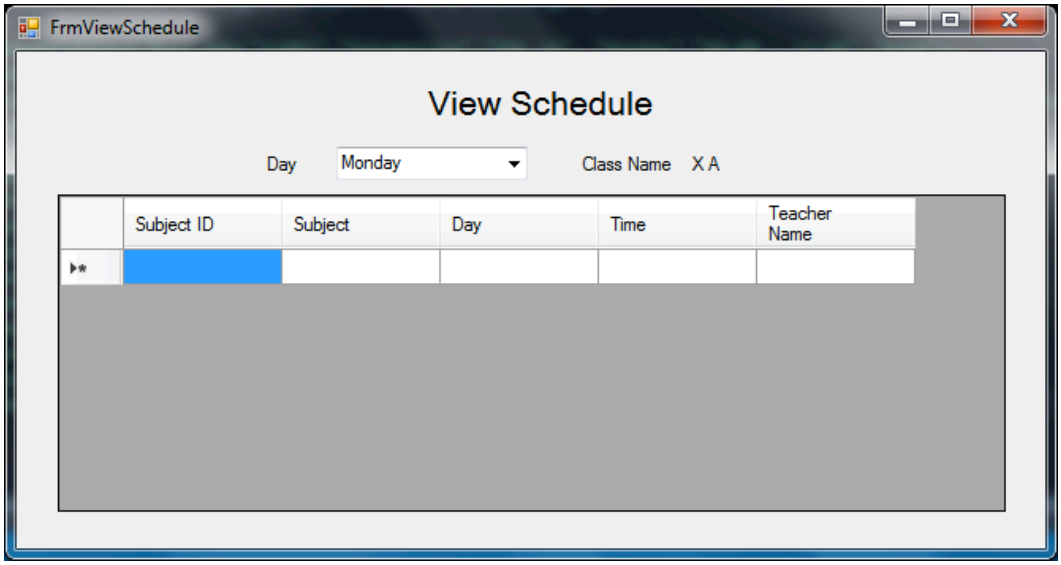
11 Finalize Schedule Form



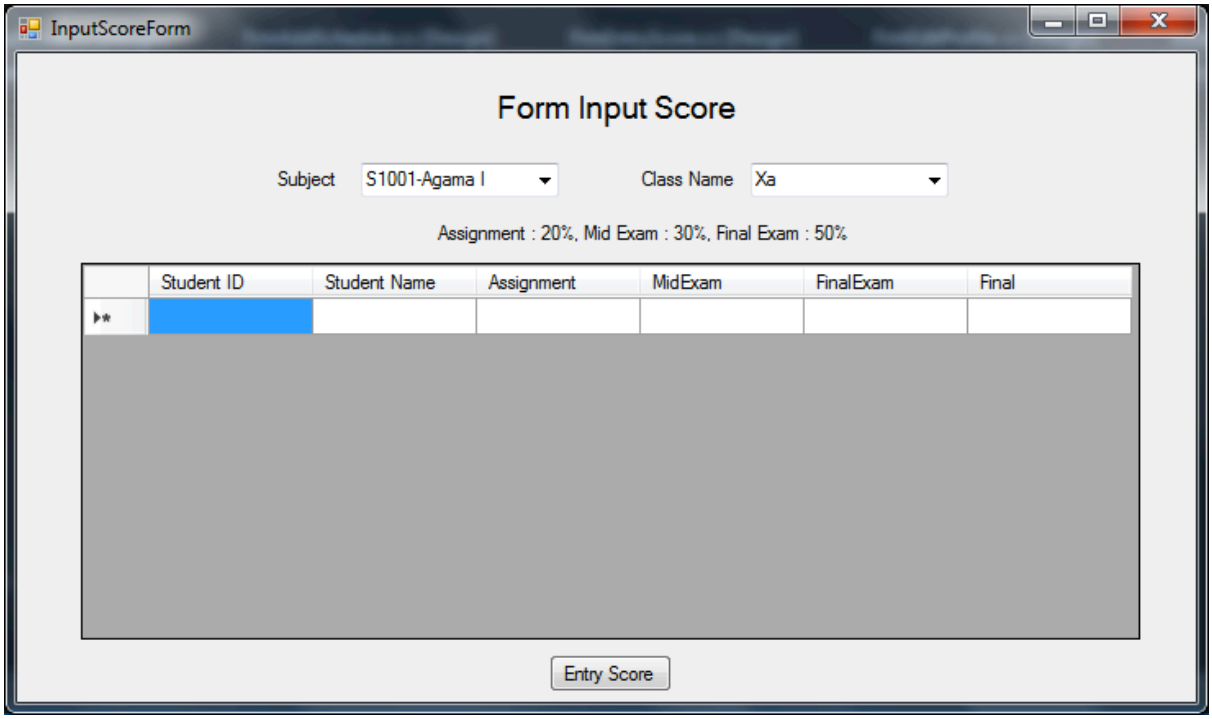
12 Teaching Schedule Form



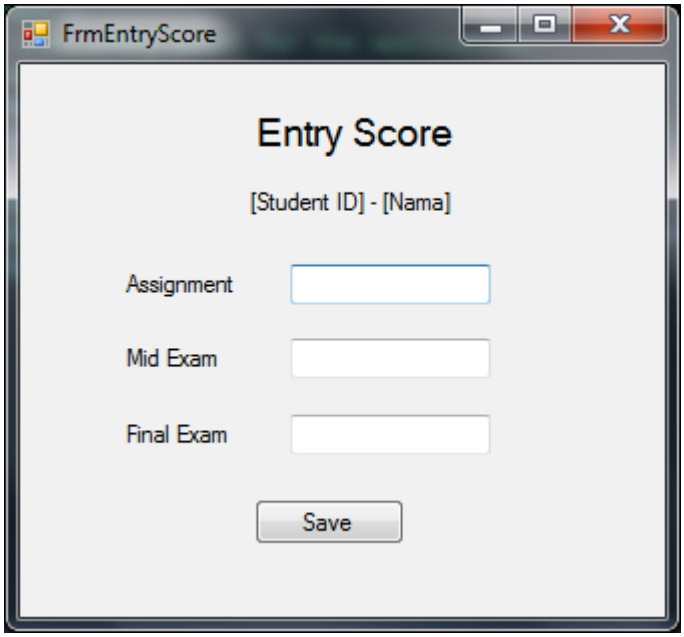
13 View Schedule Form



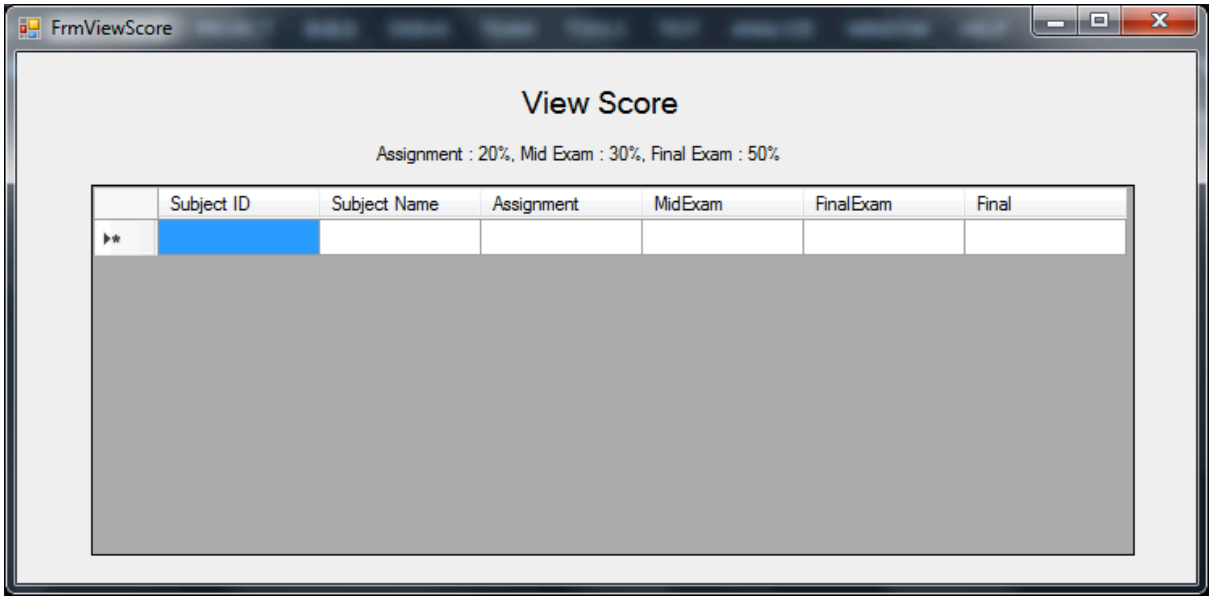
14 Input Score Form



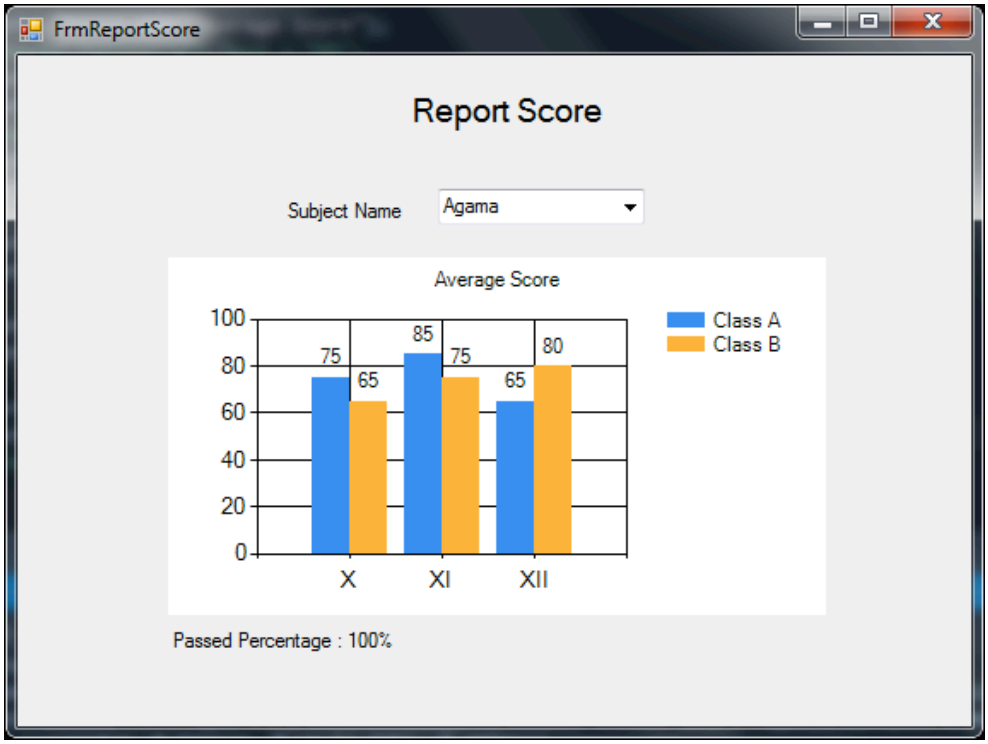
15 Entry Score Form



16 View Score Form



17 View Report Score Form



THE DEVELOPMENT OF

SMK NUSANTARA INFORMATION SYSTEM

SMK NUSANTARA is one of Indonesia famous vocational school located in Solo.. As the school growth, the Headmaster thinks it is the time to use Information System to support their business process for scheduling process. After hiring famous consultant to analyze and design the system, it is the time to develop the system.

Based on the system design given to you, you're required to develop Information system to support the business process of scheduling for SMK Nusantara. Ensure your developed solutions can accommodate SMK Nusantara business process properly, following the instruction on the project!

Module 1: Database Creation and Main Form Development

1. **Create the Database**

   Create a database using your MS SQL Server on the local database server based on given ERD and Data Dictionary given on page 3-5 for table detail score and expertise.

2. **Insert the Data**

   Insert the master data given to you on file "*data.xlsx*" to the related table on your newly created database.

3. **Create Application**

   Create an application using your preferred platform (C# or Visual Basic.NET).

4. **Create "01 Login Form"**

   Create the main menu of the application as outlined in "**01 Login Form**" in the wireframe.

   - Ensure user that have account in database can login
   - Ensure user will go to correct navigation form according to their role
   - If button logout clicked, close all window and show login form

5. **Create "02 Teacher Navigation Form"**

   Create the main menu of the application as outlined in "**02 Teacher Navigation Form**" in the wireframe.

   - Ensure this form just can be accessed by Teacher

6. **Create "03 Student Navigation Form"**

   Create the main menu of the application as outlined in "**03 Student Navigation Form**" in the wireframe.

   - Ensure this form just can be accessed by Student

7. **Create "04 Admin Navigation Form"**

   Create the main menu of the application as outlined in "**04 Admin Navigation Form**" in the wireframe.

   - Ensure this form just can be accessed by Admin

8. **Create "07 Edit Profile Form"**

   Create the main menu of the application as outlined in "**07 Edit Profile Form**" in the wireframe.

   - Ensure the form display **correct data** according to the user login
   - Ensure program can **preview image** from uploaded file
   - Ensure program have filter proper image extension while **browsing a file** from computer (***.jpg,*.png**).
   - Generate picture name with timestamp (ddmmyyhhmmss) + original extension from uploaded file. Example: if user upload image with name pp1.png at **15 May 2017 12:10:15**, the file name become **150517121015.png**
   - Ensure **Address** must be filled
   - Ensure **name** have between **3 and 20 character**.
   - Ensure **phone number** must be **11 – 12 Digit** and **start with 08**
   - If button change password is clicked, show **"08 Change Password Form"**

- If button save is clicked, program will **save** all **data** and **upload** the **picture** to the system

Module 2: Master Form Development

1. **Create "05 Manage Student Form"**

   Create the main menu of the application as outlined in "**05 Manage Student Form**" in the wireframe.

   - At the first, **studentID**, **name**, **address**, **gender**, Date of Birth (dd/mm/yyyy), and **phone number** will be **disabled** and button **save** and **cancel** will be **invisible**.
   - Ensure the form **display** all **Student data** which is stored inside the database
   - The **Search Box** will allow the user to **search based on ID, name, address, phone** in **database** that contains words according to the **inputted words** and **display** it in **datagridview**.
   - Ensure every time **user click** 1 row in **datagridview**, the **selected data** will be **displayed** in **all component** form.
   - If user click **insert** or **update button** the program will :
     - **name**, **address**, **gender**, **Date of Birth**, and **phone number** will be **enabled**, button **save** and **cancel** will be **visible** and button **insert**, **update** and **delete** will be **invisible**
     - if user click **insert**, every **text** will be **empty** and **StudentId** will be auto **generated** with **format yyyy** + **xxxx** (yyyy for this year and xxxx for number.), example : 20170001
   - Ensure **address** and **gender** must be **filled** before adding or updating the data.
   - Ensure **name** have between **3 and 20 character**.

- Ensure **phone number** must be **11 – 12 Digit** and **start with 08**
- Ensure the **age** student must be between **15** and **21** years.
- If user click **Save** or **Cancel** button, the program will :
    - **name**, **address**, **gender**, **Date of Birth**, and **phone number** will be **disabled**, button **save** and **cancel** will be in**visible** and button **insert**, **update** and **delete** will be **visible**
    - if user click **save** button, the program will generate **default password** and save every data that user inputted into database.
- Format **default password :** first character in student name (upper case) + last character in student name (lower case) + yyyy (year of birth), example : Tony, 12 July 2001. Default password : Ty2001

2. Create "06 Manage Teacher Form"

Create the main menu of the application as outlined in "**06 Manage Teacher Form**" in the wireframe.

- At the first, **TeacherID**, **name**, **address**, **gender**, **Date** of **Birth (dd/mm/yyyy)** , and **phone number** will be **disabled** and button **save** and **cancel** will be **invisible**.
- Ensure the form **display** all **Teacher data which is** stored inside the database
- The **Search Box** will allow the user to **search based on ID, name, address, and phone** in **database** that contains words according to the **inputted words** and **display** it in **datagridview**.
- Ensure every time **user click** 1 row in **datagridview**, the **selected data** will be **displayed** in **all component** form.

- If user click **insert** or **update button** the program will :
    - **name**, **address**, **gender**, **Date of Birth**, and **phone number** will be **enabled**, button **save** and **cancel** will be **visible** and button **insert**, **update** and **delete** will be **invisible**
    - if user click **insert**, every **text** will be **empty** and **StudentId** will be auto **generated** with **format T** + **xxxx**, example : T0001
- Ensure **address** and **gender** must be **filled** before adding or updating the data.
- Ensure **name** have between **3 and 20 character**.
- Ensure **phone number** must be **11 – 12 Digit** and **start with 08**
- Ensure the **age** teacher must be between **25** and **50** years.
- If user click **Save** or **Cancel** button, the program will :
    - **name**, **address**, **gender**, **Date of Birth**, and **phone number** will be **disabled**, button **save** and **cancel** will be in**visible** and button **insert**, **update** and **delete** will be **visible**
    - if user click **save** button, the program will generate **default password** and save every data that user inputted into database.
- Format **default password :** first character in teacher name (upper case) + last character in teacher name (lower case) + yyyy (year of birth), example : Tony, 12 July 2001. Default password : Ty2001

3. Create "08 Change Password Form"

Create the main menu of the application as outlined in "**08 Change Password Form**" in the wireframe.

- Ensure user must input **correct old password**
- Ensure user input **new password** with **correct format** (contains upper case, lower case, number with total 6-9 character).
- Ensure **confirm password** must be same with **new password**.
- If **save button** is clicked, **save new password** into database and close the form

Module 3: Schedule Form Development

1. **Create "09 Manage Class Form"**

   Create the main menu of the application as outlined in "**09 Manage Class Form**" in the wireframe.

   - Ensure the form display all Students who have not got schedule yet.
   - Ensure the form display all participate Students in selected class.
   - Success add Student to selected class
   - Ensure user can take out a student from selected class
   - Save data to database

2. **Create "10 Manage Schedule Form"**

   Create the main menu of the application as outlined in "**10 Manage Schedule Form**" in the wireframe.

   - Ensure the form can **display** correct **Schedule** on datagridview according selected **class name** and **day**
   - Ensure the form can display subject id and name in combobox with correct format (SubjectId-SubjectName)
   - Display list of subject id and name in combobox according selected class ID (if user choose class XA, just display subjects for grade 1)
   - Display teacher id and name in combobox with correct format (TeacherId-Name)
   - Ensure only **available teachers** are **displayed** in Combobox according teacher **expertise** and **schedule**

- If button view subject needed is clicked, display subject needed in datagridview according to selected class name. (**SubjectId** – **SubjectName** – **Shift Needed** – **Shift Left**)
- Subject, Shift and Teacher display correct data according to selected datagridview
- If button insert or update is clicked, the program will enable **Subject**, **Shift** and **Teacher. Save** and **Cancel** button will be visible. **Insert**, **update** and **delete** button will be invisible
- Ensure in 1 class, the schedule cannot collide each other
- Ensure 1 **SubjectID** in 1 **Class**, just have 1 **TeacherID**
- If button cancel or save is clicked, the program will disable **Subject**, **Shift** and **Teacher. Save** and **Cancel** button will be invisible. **Insert**, **update** and **delete** button will be visible
- If button **save** is clicked, save all data to the database.
- If button **delete** is clicked, **ask confirmation** to user “Are you sure?” with option **yes** or **no**. If user choose **yes**, the program will delete the selected data.
- the schedule that already finalized, cannot be changed (disabled every button)

3. **Create “11 Finalize Schedule Form”**

   Create the main menu of the application as outlined in “**11 Finalize Schedule Form**” in the wireframe.

   - display all data schedule according selected class (SubjectID, Subject Name, Teacher ID, Teacher Name, Day, Shift)

- Ensure selected class have every subject needed according its class
- Ensure every subject have total shift as required on table subject.
- success Finalize data or display detail error if any, example: shift in Monday is less than 10, not Enough Shift for Agama Subject
- the schedule that already finalized, cannot be changed (disabled every button)

Module 4: View Schedule and Score Development

1. **Create "12 Teaching Schedule and 13 View Schedule Form"**

   Create the main menu of the application as outlined in "**12 Teaching Schedule"** for Teacher **and "13 View Schedule Form**" for Student in the wireframe.

   - Display right data according to user login (student schedule/ teacher schedule)
   - Display right data according student filter.
   - show data that already finalized
   - teacher can see all student in his/her selected schedule

2. **Create "14 Input Score Form"**

   Create the main menu of the application as outlined in "**14 Input Score Form**" in the wireframe.

   - show correct list **subject** and **class name** in **combobox** based on teaching **schedule** (**change** every time **user change list subject** or **class name** in combobox)
   - display **data** from **schedule** that already **finalized**
   - show correct **assessment percentage** information according **selected subject**
   - display **final score** using **right formula** according **subject table**
   - display entry score form when "Entry Score" button is clicked based on selected **StudentId** and **name**

3. **Create "15 Entry Score Form"**

Create the main menu of the application as outlined in "**15 Entry Score Form**" in the wireframe.

- validate every score between 0 and 100
- display correct score according selected student
- if button save clicked, save the inputted score to the database to the right student and close the form

4. **Create "16 View Score Form"**

Create the main menu of the application as outlined in "**16 View Score Form**" for Student in the wireframe.

- student can view all score for his/her subject
- display final score using right formula according subject table

5. **Create "17 View Report Score Form"**

Create the main menu of the application as outlined in "**17 View Report Score Form**" in the wireframe.

- Admin can view report average score for each class by selected subject
- Display the graphic with correct format
- Admin can view passing rate for each grade with formula : **total student who have Final score below 60 / total student who participate in that subject**