Regex Academy

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School Management System

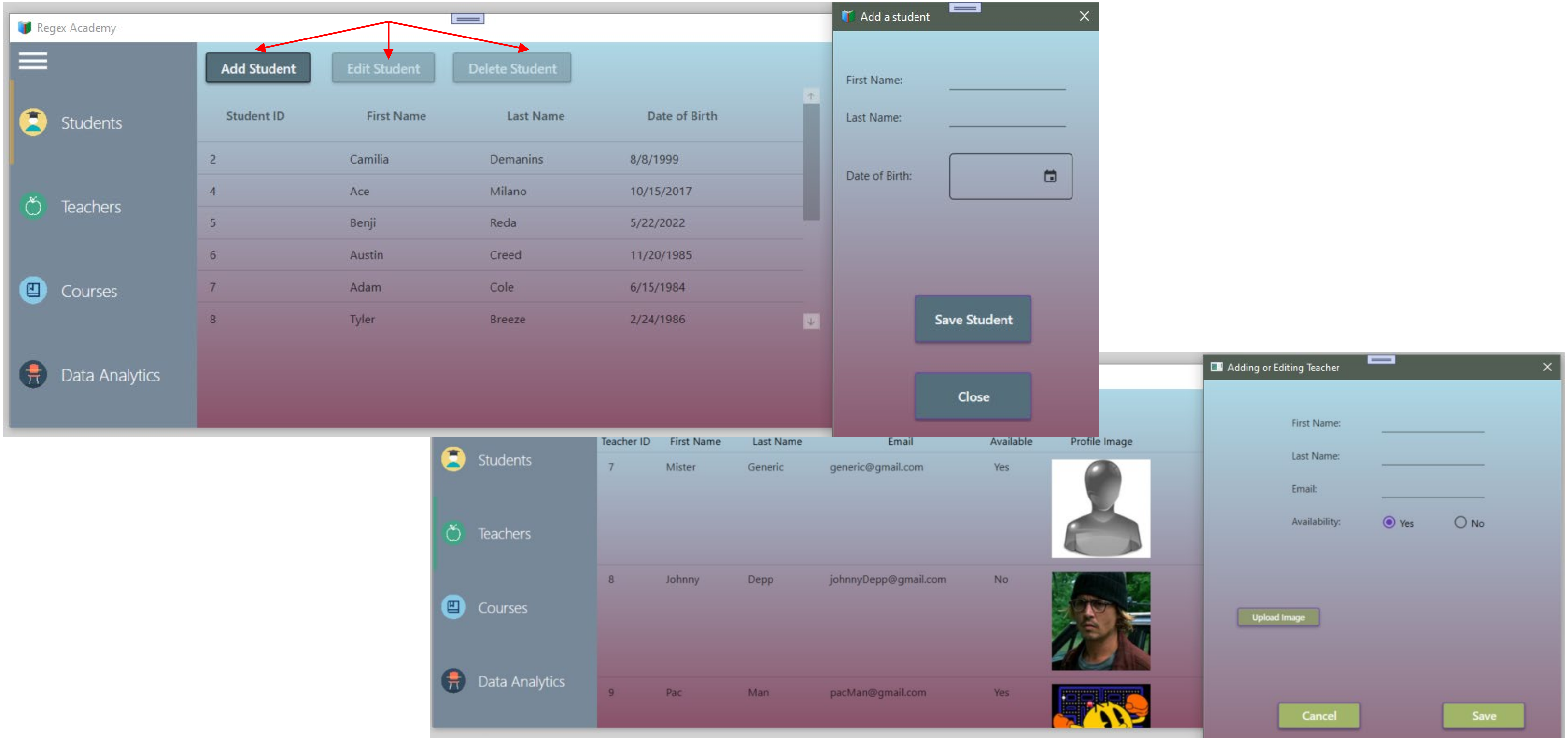
- Hire and manage teachers
- Enroll and manage students
- Create courses with schedules

- Assign students to courses
- Assign a teacher to courses
- Provide relevant data and graphs

Purpose

“Provide the school administrator with a time saving tool”

Solution Overview



Student ID	First Name	Last Name	Date of Birth
2	Camilia	Demanins	8/8/1999
4	Ace	Milano	10/15/2017
5	Benji	Reda	5/22/2022
6	Austin	Creed	11/20/1985
7	Adam	Cole	6/15/1984
8	Tyler	Breeze	2/24/1986

First Name:

Last Name:

Date of Birth:

Teacher ID	First Name	Last Name	Email	Available	Profile Image
7	Mister	Generic	generic@gmail.com	Yes	
8	Johnny	Depp	johnnyDepp@gmail.com	No	
9	Pac	Man	pacMan@gmail.com	Yes	

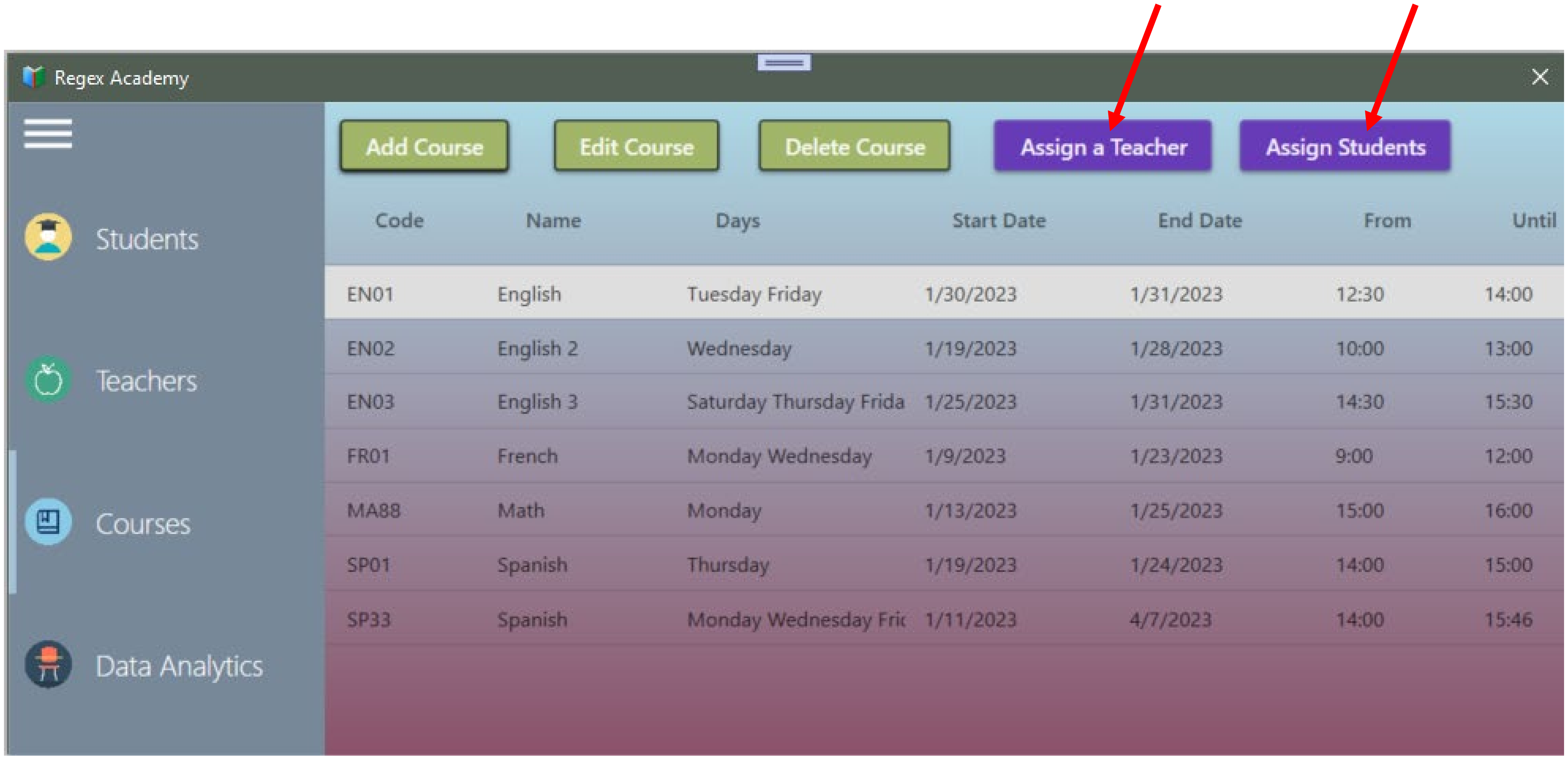
First Name:

Last Name:

Email:

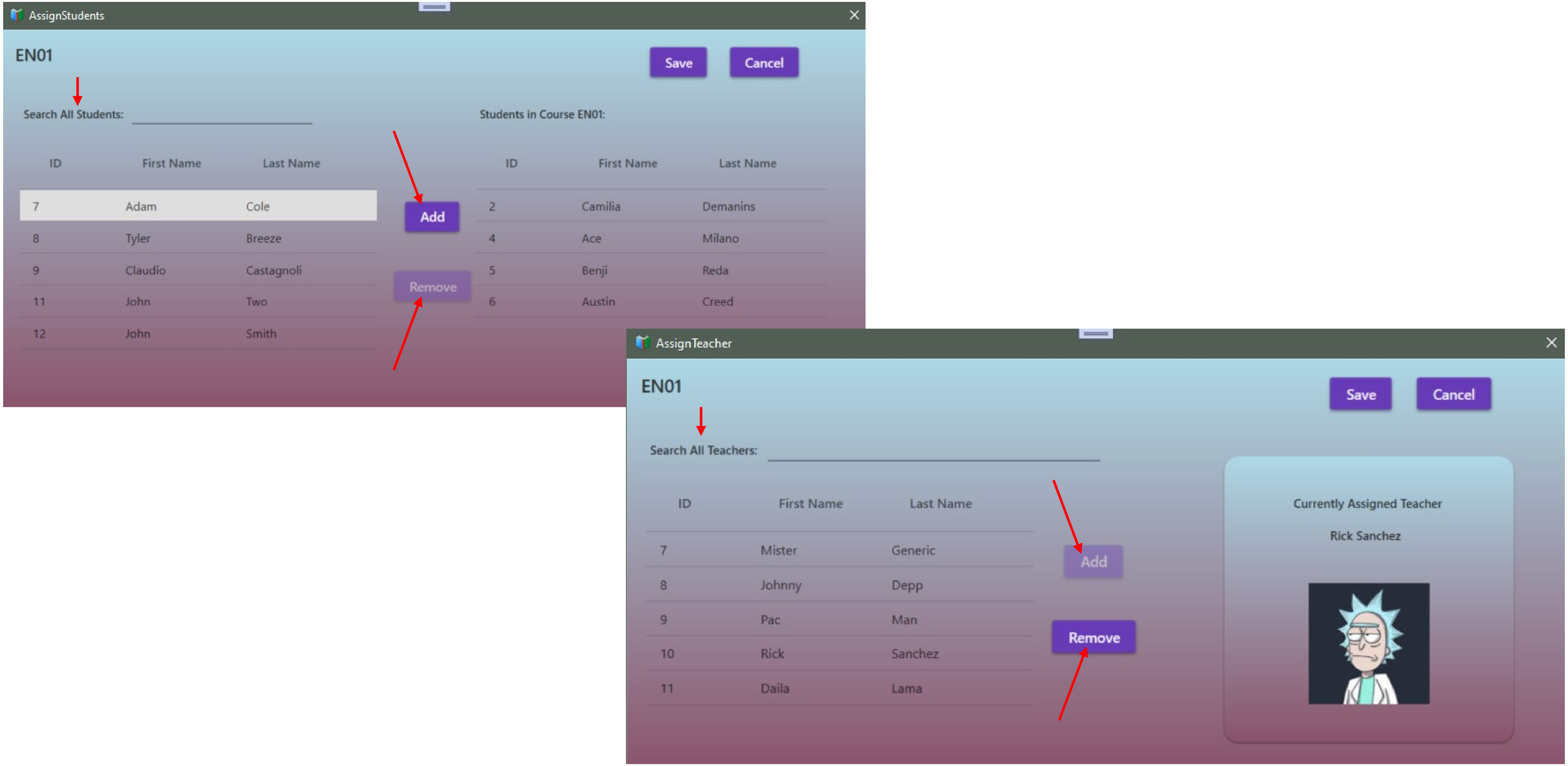
Availability: ● Yes ○ No

Solution Overview



Code	Name	Days	Start Date	End Date	From	Until
EN01	English	Tuesday Friday	1/30/2023	1/31/2023	12:30	14:00
EN02	English 2	Wednesday	1/19/2023	1/28/2023	10:00	13:00
EN03	English 3	Saturday Thursday Frida	1/25/2023	1/31/2023	14:30	15:30
FR01	French	Monday Wednesday	1/9/2023	1/23/2023	9:00	12:00
MA88	Math	Monday	1/13/2023	1/25/2023	15:00	16:00
SP01	Spanish	Thursday	1/19/2023	1/24/2023	14:00	15:00
SP33	Spanish	Monday Wednesday Fric	1/11/2023	4/7/2023	14:00	15:46

Solution Overview



AssignStudents

EN01

Search All Students:

ID	First Name	Last Name
7	Adam	Cole
8	Tyler	Breeze
9	Claudio	Castagnoli
11	John	Two
12	John	Smith

Students in Course EN01:

ID	First Name	Last Name
2	Camilia	Demanins
4	Ace	Milano
5	Benji	Reda
6	Austin	Creed

AssignTeacher

EN01

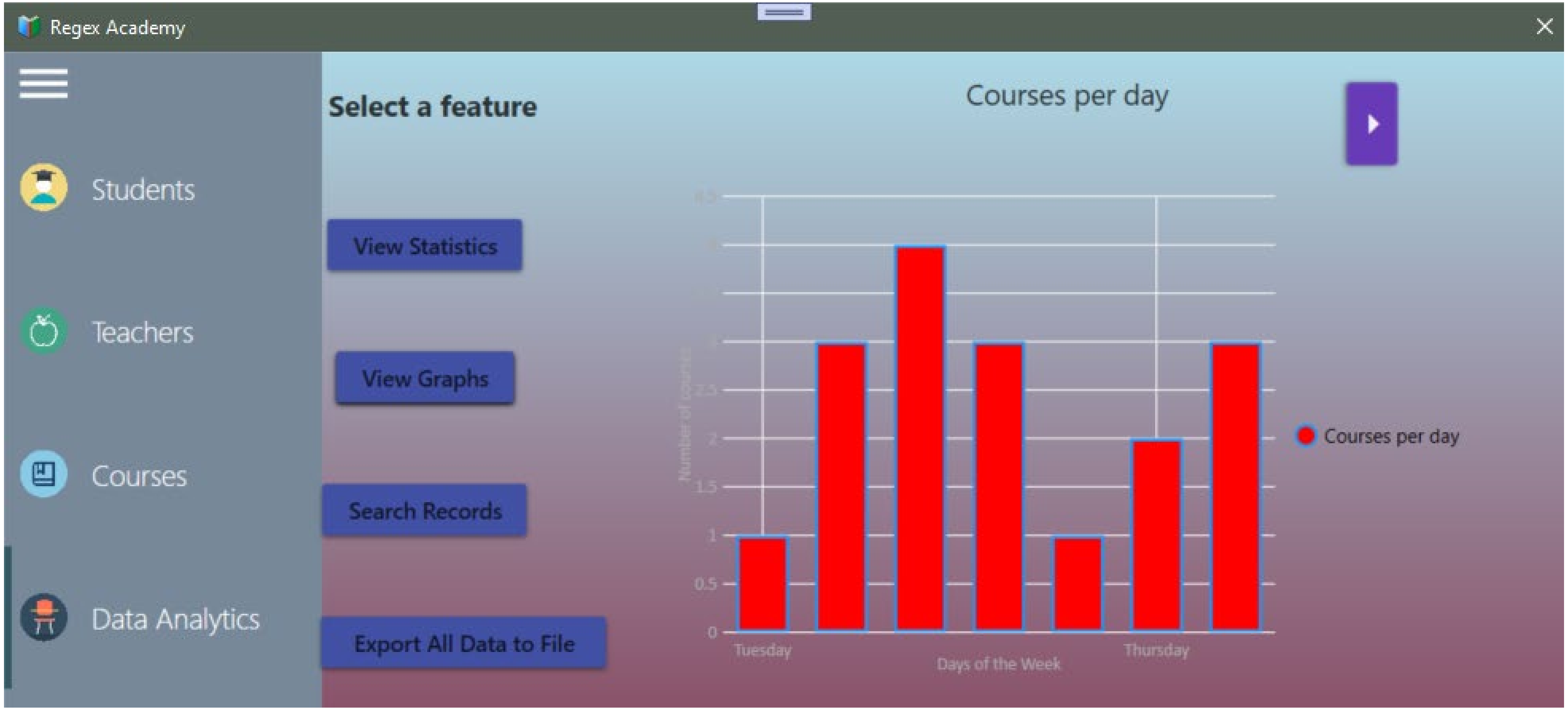
Search All Teachers:

ID	First Name	Last Name
7	Mister	Generic
8	Johnny	Depp
9	Pac	Man
10	Rick	Sanchez
11	Daila	Lama

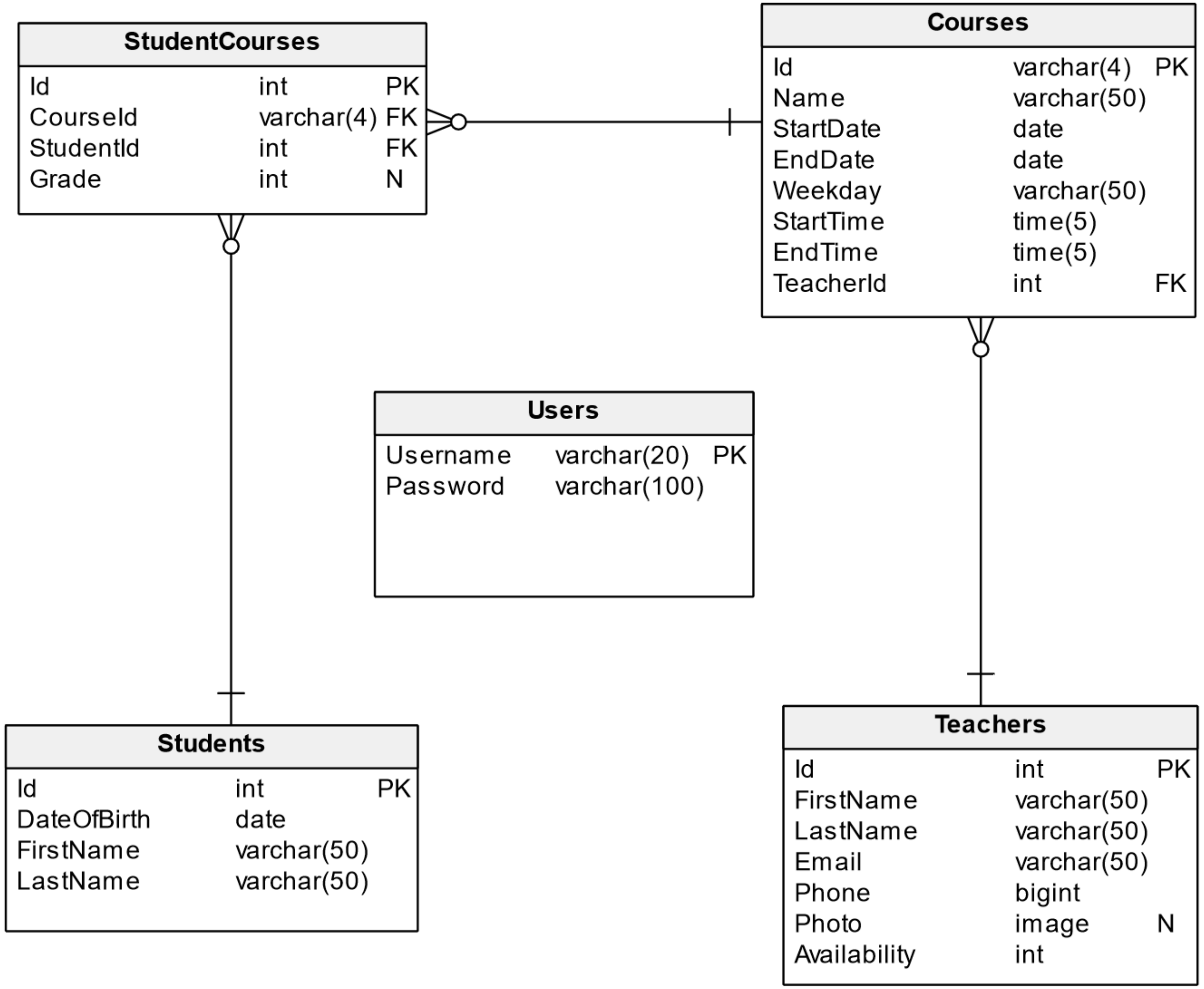
Currently Assigned Teacher

Rick Sanchez

Solution Overview



Database Structure



StudentCourses

Id	int	PK
CourseId	varchar(4)	FK
StudentId	int	FK
Grade	int	N

Courses

Id	varchar(4)	PK
Name	varchar(50)	
StartDate	date	
EndDate	date	
Weekday	varchar(50)	
StartTime	time(5)	
EndTime	time(5)	
TeacherId	int	FK

Users

Username	varchar(20)	PK
Password	varchar(100)	

Students

Id	int	PK
DateOfBirth	date	
FirstName	varchar(50)	
LastName	varchar(50)	

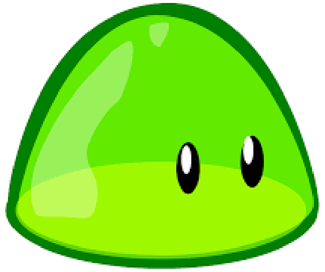
Teachers

Id	int	PK
FirstName	varchar(50)	
LastName	varchar(50)	
Email	varchar(50)	
Phone	bigint	
Photo	image	N
Availability	int	

Challenges & Solutions

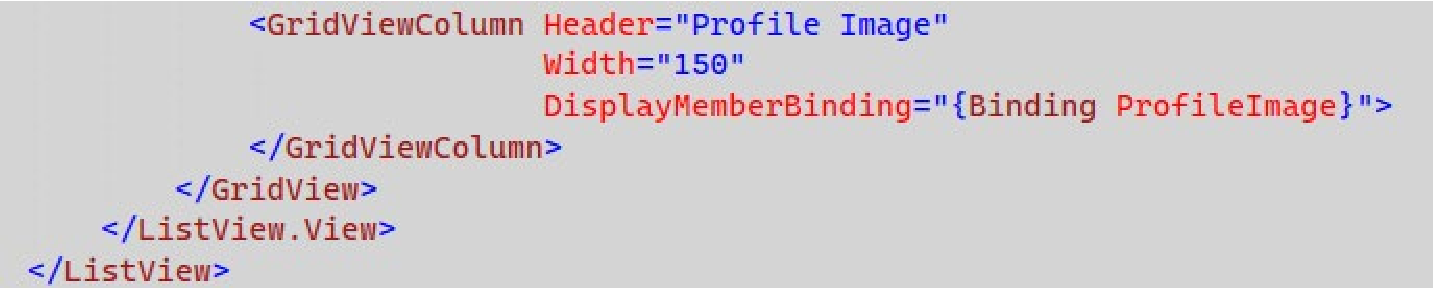
(Seena)

Blobs

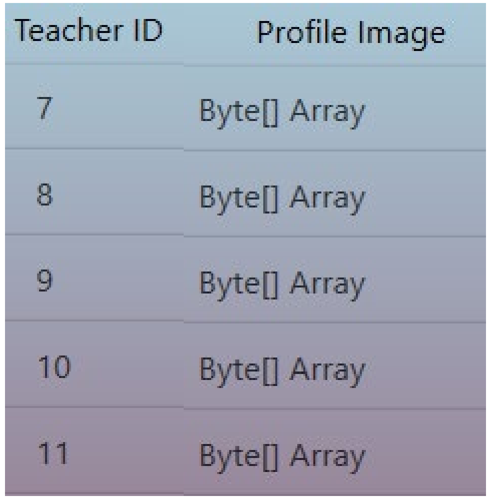


Challenges

- Retrieving a blob and displaying it in a ListView

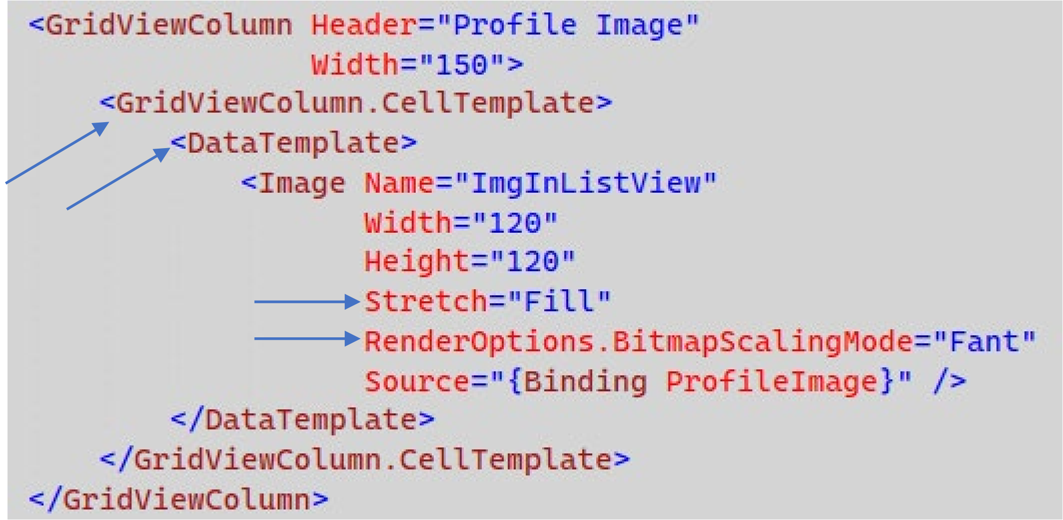


```
            <GridViewColumn Header="Profile Image"
                            Width="150"
                            DisplayMemberBinding="{Binding ProfileImage}">
            </GridViewColumn>
        </GridView>
    </ListView.View>
</ListView>
```



Teacher ID	Profile Image
7	Byte[] Array
8	Byte[] Array
9	Byte[] Array
10	Byte[] Array
11	Byte[] Array

Solution

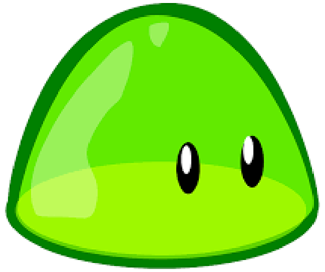


```
<GridViewColumn Header="Profile Image"
                Width="150">
    <GridViewColumn.CellTemplate>
        <DataTemplate>
            <Image Name="ImgInListView"
                   Width="120"
                   Height="120"
                   Stretch="Fill"
                   RenderOptions.BitmapScalingMode="Fant"
                   Source="{Binding ProfileImage}" />
        </DataTemplate>
    </GridViewColumn.CellTemplate>
</GridViewColumn>
```

Challenges & Solutions

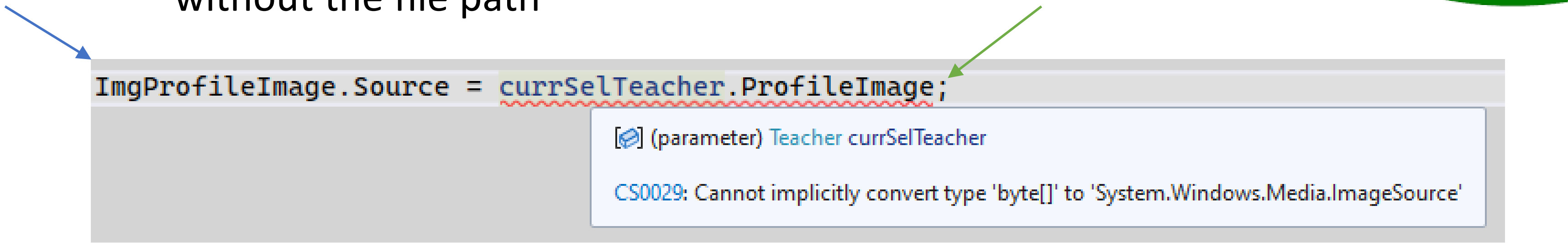
(Seena)

Blobs



Challenges

- Retrieving a blob and displaying it in general without the file path



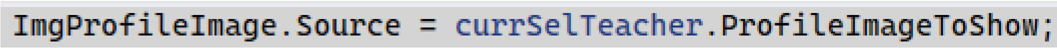
```
ImgProfileImage.Source = currSelTeacher.ProfileImage;
```

(parameter) Teacher currSelTeacher

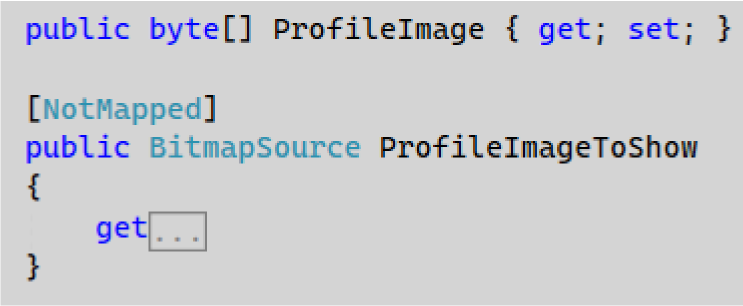
CS0029: Cannot implicitly convert type 'byte[]' to 'System.Windows.Media.ImageSource'

Solution

- Helper property in entity model



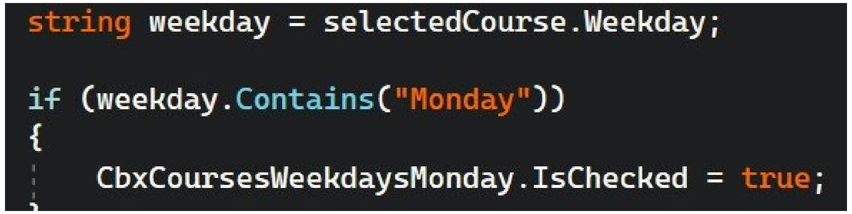
```
ImgProfileImage.Source = currSelTeacher.ProfileImageToShow;
```



```
public byte[] ProfileImage { get; set; }

[NotMapped]
public BitmapSource ProfileImageToShow
{
    get...
}
```

Challenges & Solutions (Chris)

Checkboxes



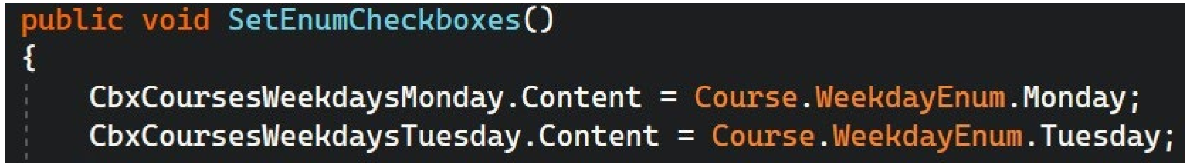
```
string weekday = selectedCourse.Weekday;

if (weekday.Contains("Monday"))
{
    CbxCoursesWeekdaysMonday.IsChecked = true;
```

Challenges

- Trying to parse a string into enum value and taking into account multiple selections

Solution

- To initialize the content of the checkboxes based on the enum values, adding triggers for each selection, a stringbuilder residing in a loop would then convert the content back into strings for display purposes while the enums themselves were entered into the db



```
public void SetEnumCheckboxes()
{
    CbxCoursesWeekdaysMonday.Content = Course.WeekdayEnum.Monday;
    CbxCoursesWeekdaysTuesday.Content = Course.WeekdayEnum.Tuesday;
```

Unit Testing (NUnit)

Challenges

- Discovering that unit tests can only target methods within model classes

Solution

- Using MVVM structure, then moving some advanced validations out from the code-behind into either the setters or into the Globals file.

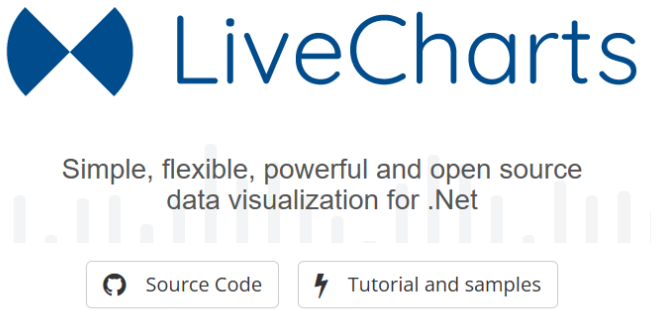
Challenges & Solutions

(Kevin)

Documentation

Challenges

- Encountered poor documentation for a third party library
- Examples did not work


LiveCharts

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Solution

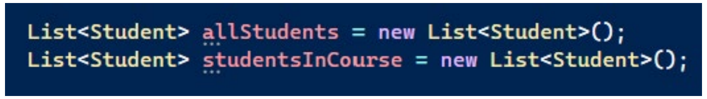
Trial & Error + stackoverflow

Challenges & Solutions (Matt)

Assigning Students to Courses

Challenge

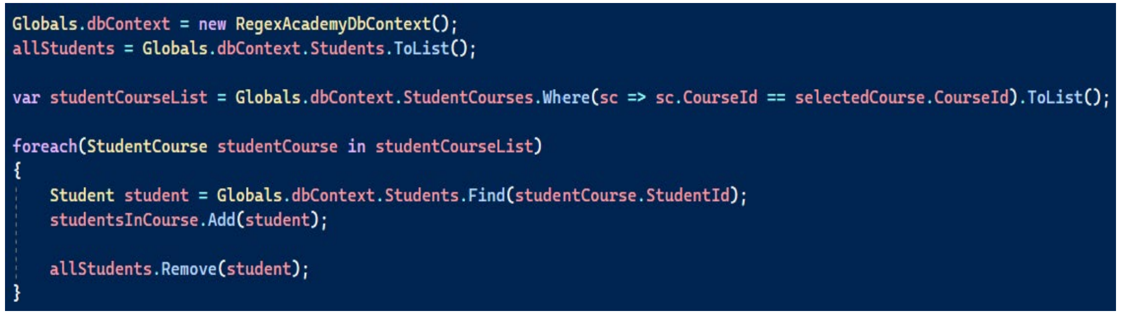
- Saving the proper changes in the appropriate tables only as a User presses “Save”.



```
List<Student> allStudents = new List<Student>();
List<Student> studentsInCourse = new List<Student>();
```

Solution

- When saving, compare the current list of students in the course, to the database.

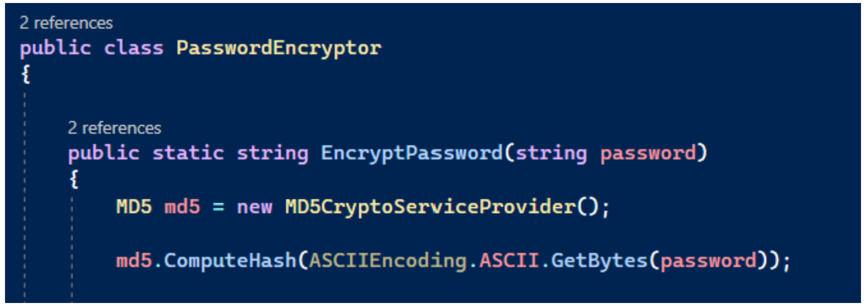


```
Globals.dbContext = new RegexAcademyDbContext();
allStudents = Globals.dbContext.Students.ToList();

var studentCourseList = Globals.dbContext.StudentCourses.Where(sc => sc.CourseId == selectedCourse.CourseId).ToList();

foreach(StudentCourse studentCourse in studentCourseList)
{
    Student student = Globals.dbContext.Students.Find(studentCourse.StudentId);
    studentsInCourse.Add(student);

    allStudents.Remove(student);
}
```

Password Encryption

Challenge

- WPF has a built in encryption method, however I was receiving errors every time I tried to use it.



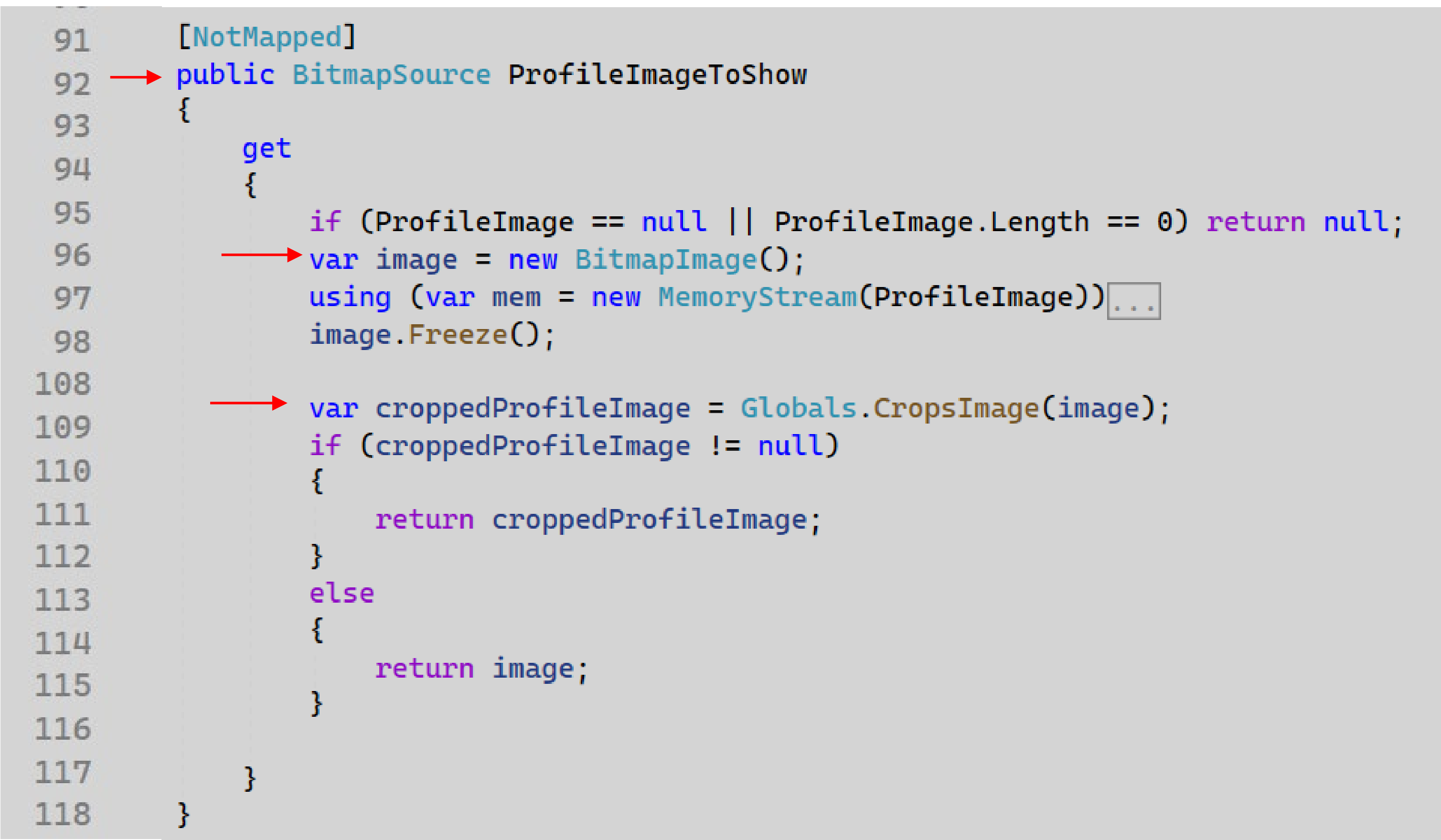
```
2 references
public class PasswordEncryptor
{

    2 references
    public static string EncryptPassword(string password)
    {
        MD5 md5 = new MD5CryptoServiceProvider();

        md5.ComputeHash(ASCIIEncoding.ASCII.GetBytes(password));
```

Solution

- I created my own Encryption class which will encrypt the password in the exact way I wanted.
- Upon registration, when creating a new ‘User’, the class and method would be called to encrypt the password.

What I learned (Seena)

CroppedBitmap & BitmapImage are children of BitmapSource

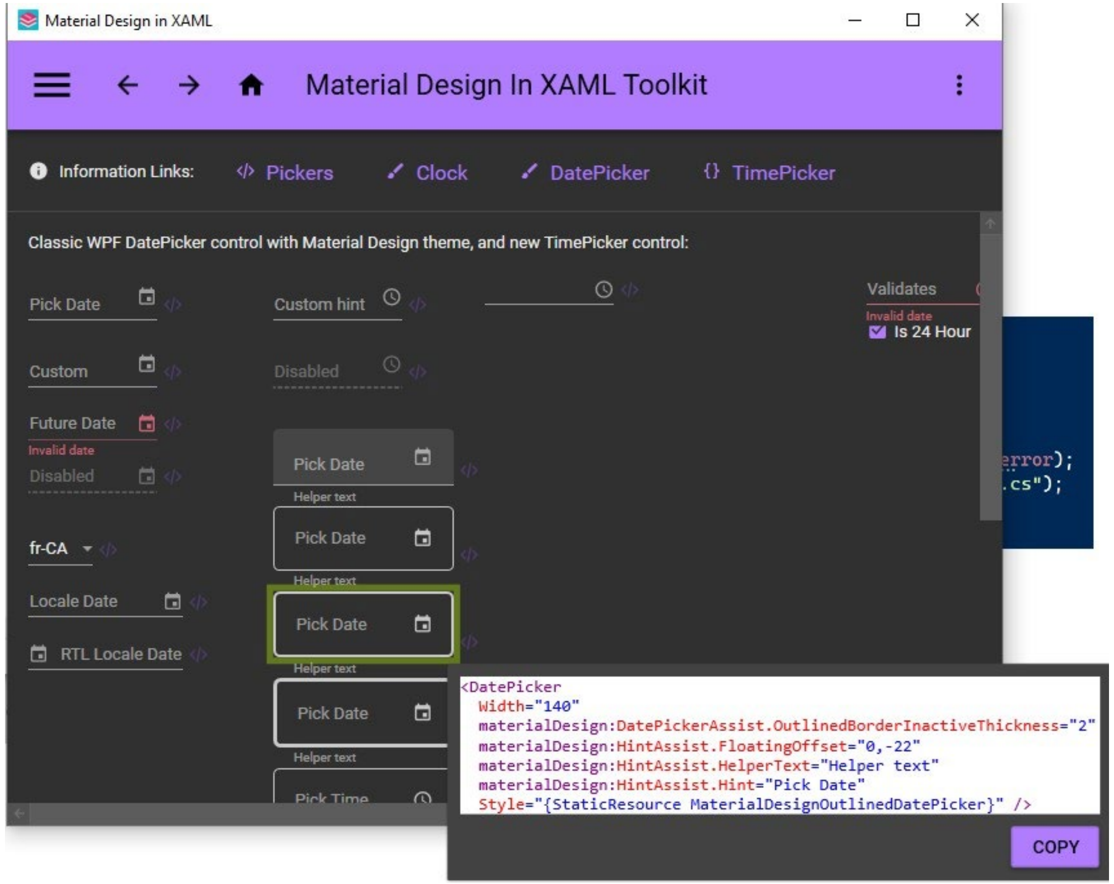


```
[NotMapped]
public BitmapSource ProfileImageToShow
{
    get
    {
        if (ProfileImage == null || ProfileImage.Length == 0) return null;
        var image = new BitmapImage();
        using (var mem = new MemoryStream(ProfileImage))...
        image.Freeze();

        var croppedProfileImage = Globals.CropsImage(image);
        if (croppedProfileImage != null)
        {
            return croppedProfileImage;
        }
        else
        {
            return image;
        }

    }
}
```

What I learned (Chris)

While the community and even the official documentation was sometimes lacking, there's a vast selection of 3rd party libraries going back 10+ years that still function. The creativity one can achieve by discovering the custom properties people have built in expanded what I thought was possible in WPF.

The interactions between exceptions thrown in model classes vs MessageBoxes and caught exceptions in the code-behind



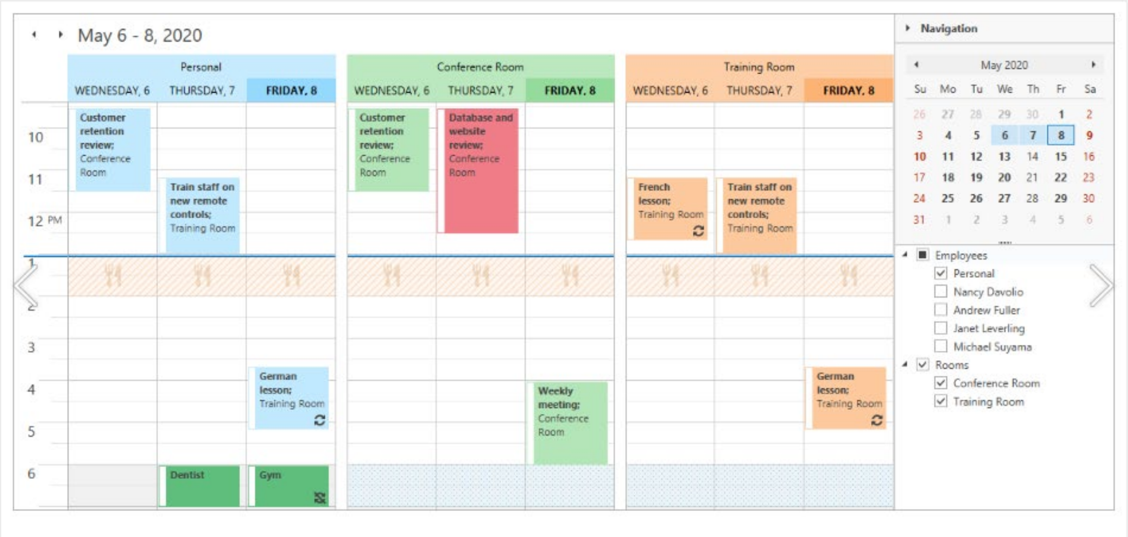
Classic WPF DatePicker control with Material Design theme, and new TimePicker control:

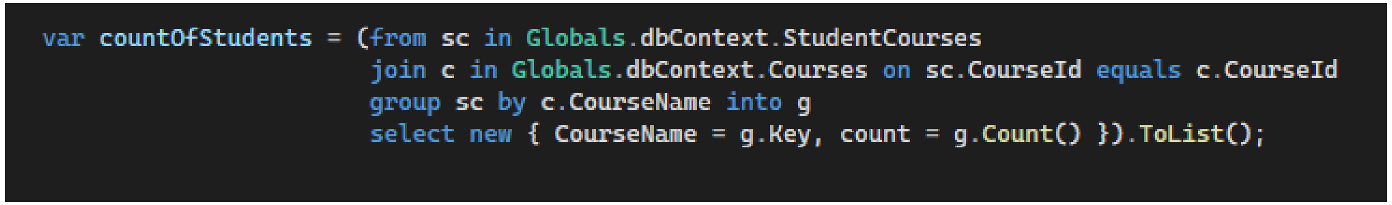
```
<DatePicker
  Width="140"
  materialDesign:DatePickerAssist.OutlinedBorderInactiveThickness="2"
  materialDesign:HintAssist.FloatingOffset="0,-22"
  materialDesign:HintAssist.HelperText="Helper text"
  materialDesign:HintAssist.Hint="Pick Date"
  Style="{StaticResource MaterialDesignOutlinedDatePicker}" />
```

```
error);
.cs");
```

What I learned (Kevin)

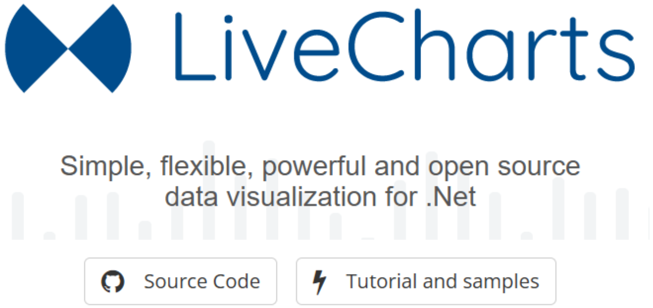
nuget





```
var countOfStudents = (from sc in Globals.dbContext.StudentCourses
                       join c in Globals.dbContext.Courses on sc.CourseId equals c.CourseId
                       group sc by c.CourseName into g
                       select new { CourseName = g.Key, count = g.Count() }).ToList();
```

LINQ Microsoft .NET



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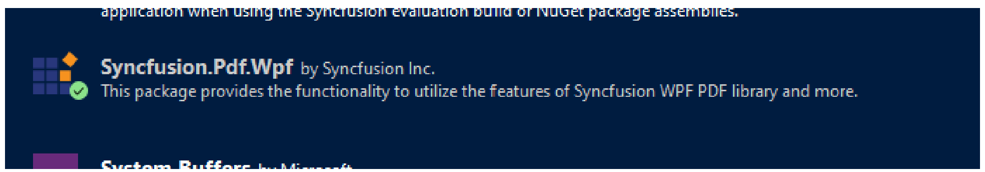
SyncFusion Export to PDF

What I learned (Matt)

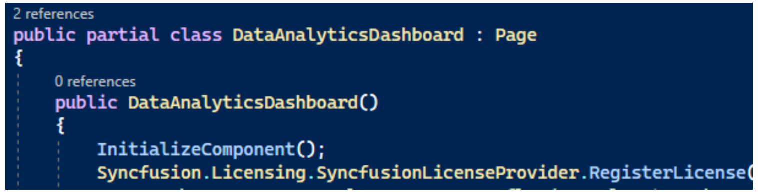
- In our project, in order to export as a PDF file, we installed the SyncFusion.Pdf.Wpf library.
- In order to fully access SyncFusion I had to create an account to access the license.
- The license then needed to be pasted in the xaml.cs file where the export method was taking place.
- After importing all the appropriate libraries, I created a loop for while the document is being created.
  - In this loop, I create the page, graphics and font I want for my file.
  - PdfPage is the creation of the file’s page
  - PdfGraphics is what will display the data on the page
  - PdfFont is the font size and family of the data.



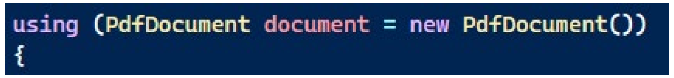
application when using the Syncfusion evaluation build or NuGet package assemblies.

Syncfusion.Pdf.Wpf by Syncfusion Inc.
This package provides the functionality to utilize the features of Syncfusion WPF PDF library and more.

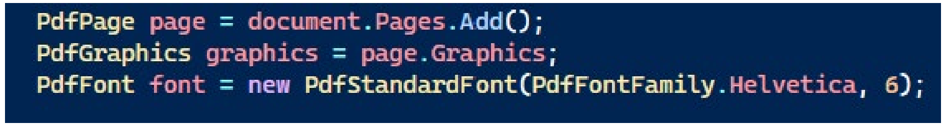
System.Buffers by Microsoft



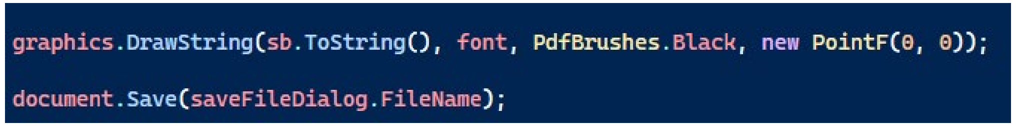
```
2 references
public partial class DataAnalyticsDashboard : Page
{
    0 references
    public DataAnalyticsDashboard()
    {
        InitializeComponent();
        Syncfusion.Licensing.SyncfusionLicenseProvider.RegisterLicense(
```



```
using (PdfDocument document = new PdfDocument())
{
```



```
PdfPage page = document.Pages.Add();
PdfGraphics graphics = page.Graphics;
PdfFont font = new PdfStandardFont(PdfFontFamily.Helvetica, 6);
```



```
graphics.DrawString(sb.ToString(), font, PdfBrushes.Black, new PointF(0, 0));

document.Save(saveFileDialog.FileName);
```

Future Work

- What would we have done if we had an extra week?
  - Allow users to register as Students or Teachers as well as admin.
    - This would allow us to have gated content on our application depending on the user type.
  - Give Students and Teachers the ability to view/edit their course schedules.
  - Track every students grade in each of their courses to see who passes/fails.
  - Add more graphs and charts using multiple third party libraries.
  - File export to only export certain data not all
  - Allow users to send info by email (to students, teachers, other admin, etc.)
  - Allow users to upload Student/Teacher/Course list by CSV

Thanks!