

# BONUS ACTIVITY

## +3 POINTS

In the first part, you will develop a Student Engagement application (with **NO database**). This application is very similar to the one you have developed for the lab assignment of Module 9. The **user interface is already created**. Please download the zipped project file provided and use it to develop your application.

Users will be able to add two types of engagement: Reading and Video. Both engagement types have id and name properties in common. The engagement is measured with different indicators depending on the type. These indicators for each engagement type is listed below:

### Reading Engagement:

- Number of highlights,
- Number of bookmarks,
- Number of pages read,
- Number of pages skipped.

### Video Engagement:

- Number of pauses,
- Number of plays,
- Minutes skipped (in seconds),
- Minutes watched (in seconds).

You are supposed to create **three** classes and apply the **INHERETINCE** concept. As shown below, the users should be able to create reading or video engagement records through different tab pages. Engagement records should be displayed in the list box.

Form1

Student Engagement

Engagement Id : 0

Engagement name :

Reading Engagement Video Engagement

# of highlights :

# of bookmarks :

# of pages skipped :

# of pages read :

Create

Student Engagement Records

Please fill the form to create engagement record.

Engagement score is displayed here.

## Error Handling

When a non-numeric value is entered in any of the fields, an error message should be displayed to inform the user about which field has an invalid entry. Below are two examples. You have implemented a similar functionality for the lab assignment of Module 4.

When an invalid value is entered for the # of highlights field:

The screenshot shows a Windows application window titled "Form1". It contains two main sections: "Student Engagement" and "Student Engagement Records".

In the "Student Engagement" section, there are two input fields: "Engagement Id :" with the value "0" and "Engagement name :". Below these are two tabs: "Reading Engagement" (selected) and "Video Engagement". Under the "Reading Engagement" tab, there are four input fields: "# of highlights :" with the value "abc", "# of bookmarks :" with the value "10", "# of pages skipped :" with the value "5", and "# of pages read :" with the value "5". A "Create" button is located below these fields.

In the "Student Engagement Records" section, there is a large empty rectangular box. Below it, the text "Engagement score is displayed here." is visible.

At the bottom left of the form, a red error message reads: "Invalid highlights entry."

When an invalid value is entered for the # of pages skipped field:

The screenshot shows the same Windows application window titled "Form1". The layout is identical to the previous screenshot, but with different values in the input fields.

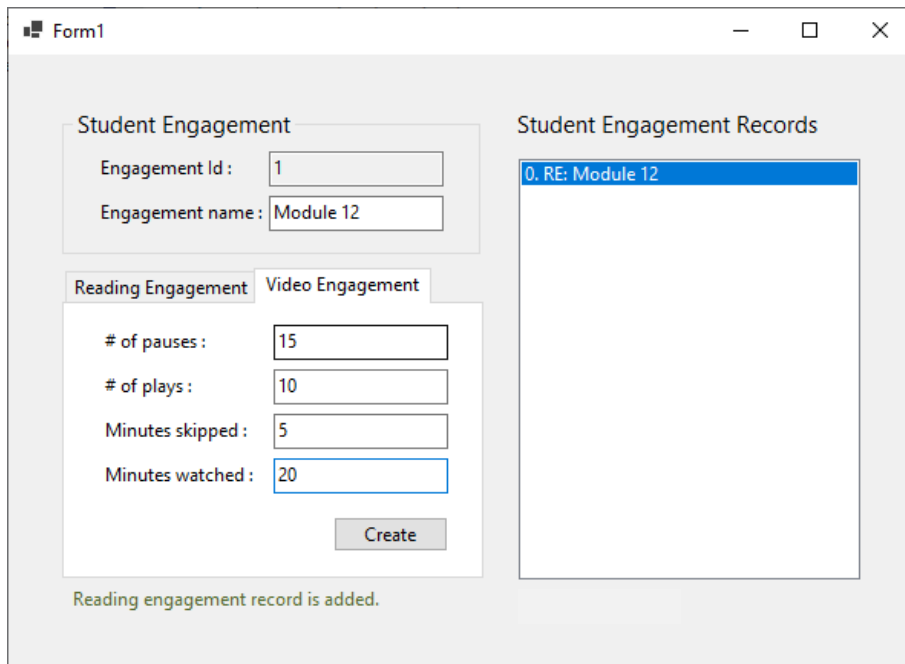
In the "Student Engagement" section, the "Engagement Id :" field still has the value "0". The "Engagement name :" field is empty. Under the "Reading Engagement" tab, the "# of highlights :" field now has the value "5", the "# of bookmarks :" field has the value "10", the "# of pages skipped :" field has the value "xyz", and the "# of pages read :" field has the value "5". The "Create" button is still present.

The "Student Engagement Records" section remains the same, with the empty box and the text "Engagement score is displayed here."

At the bottom left, a red error message reads: "Invalid pages skipped entry."

## Adding and listing new records

Once valid values are provided, the user should be able to create a new engagement record. The screen below shows a screen when entering values for a new video engagement record. All existing engagement records should be displayed in the listbox.



Form1

Student Engagement

Engagement Id : 1

Engagement name : Module 12

Reading Engagement Video Engagement

# of pauses : 15

# of plays : 10

Minutes skipped : 5

Minutes watched : 20

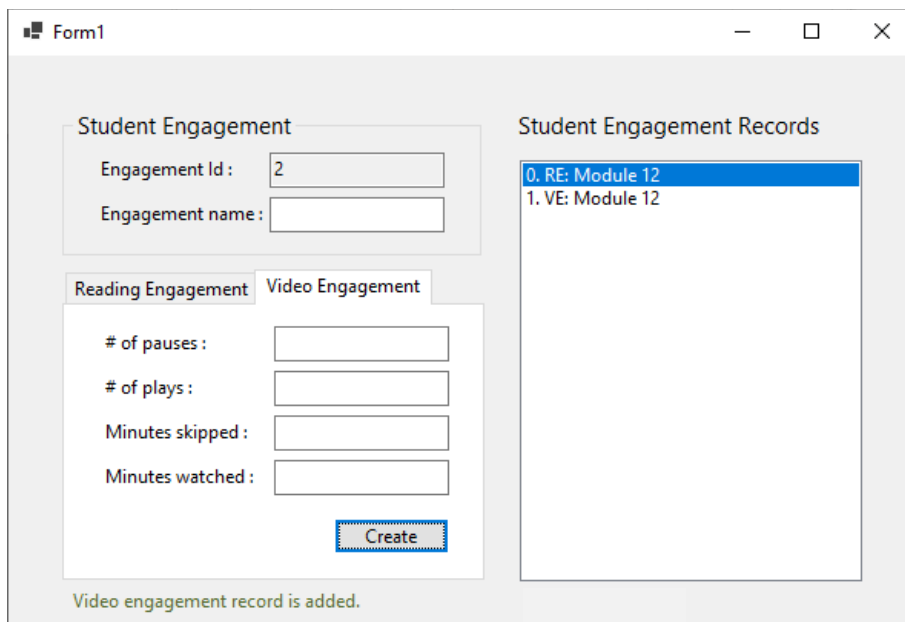
Create

Student Engagement Records

0. RE: Module 12

Reading engagement record is added.

After the Create button is clicked, the newly added record should be displayed in the list box immediately:



Form1

Student Engagement

Engagement Id : 2

Engagement name :

Reading Engagement Video Engagement

# of pauses :

# of plays :

Minutes skipped :

Minutes watched :

Create

Student Engagement Records

0. RE: Module 12

1. VE: Module 12

Video engagement record is added.

**Please pay attention to the display text when items are listed.** RE or VE are added between the engagement id and name. RE indicates it is a reading engagement, VE indicates it is a video engagement. We have done something quite similar in the in-class exercises of Module 9.

## Calculating the engagement scores

An engagement score should be computed based on the engagement indicators. The formula for this calculation is different for each engagement type. The formulas are provided below:

### Reading Engagement:

$$(\# \text{ of Highlights} + \# \text{ of Pages Read} + \# \text{ of Bookmarks}) / (\# \text{ of Pages Skipped} + 1);$$

### Video Engagement:

$$(\text{Minutes Watched} + \# \text{ of Pauses} + \# \text{ of Plays}) / (\text{Minutes Skipped} + 1);$$

When a single item is selected from the list, whether it is a Reading Engagement or Video Engagement, the correct formula should be applied. We have done something very similar in the in-class and lab assignment of Module 9.

For example, in the screen below, the engagement score for the second item is shown under the list box.

The screenshot shows a software window titled "Form1" with a light gray background. On the left, there is a "Student Engagement" section with two input fields: "Engagement Id:" containing the value "2" and "Engagement name:" which is empty. Below this is a tabbed interface with "Reading Engagement" selected. It contains four input fields: "# of highlights:", "# of bookmarks:", "# of pages skipped:", and "# of pages read:", all of which are empty. A "Create" button is located at the bottom of this section. A green status message at the bottom left reads "Reading engagement record is added." On the right, there is a "Student Engagement Records" section featuring a list box with two items: "0. RE: Module 12" and "1. RE: Module 12". The second item is highlighted in blue. Below the list box, the text "Engagement score: 7" is displayed.

Engagement Id	Engagement name	# of highlights	# of bookmarks	# of pages skipped	# of pages read	Engagement score
2						7