Introduction to Programming

Workshop – Saturday 22.05.2021

Julio Carrasquel

StudentData

`std::vector<Student> _data;`

```
data[0]= {John,Smith,204-2,9,10,9};
data[1]= {Lucy,Andrews,204-1,8,7,8};
```

QStandardItemModel model;

MainWindow _ □ ✕

Click Me `ui->tableView`

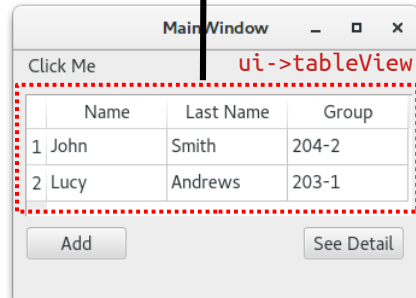|	Name	Last Name	Group
1	John	Smith	204-2
2	Lucy	Andrews	203-1

| Add | | See Detail |

StudentData

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data[0]= {John,Smith,204-2,9,10,9};
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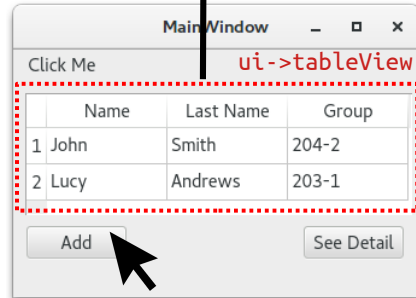
QStandardItemModel model;

MainWindow _ □ ✕

Click Me   ui->tableView

	Name	Last Name	Group
1	John	Smith	204-2
2	Lucy	Andrews	203-1

Add   See Detail

```
void MainWindow::on_pushButton_2_clicked()
{
  AddWindow addWindow;

  addWindow.setModelPointer(model);
  addWindow.setDataPointer(studentData)

  addWindow.setModal(true);
  addWindow.exec();
}
```

StudentData

std::vector<Student> _data;

data[0]= {John,Smith,204-2,9,10,9};
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QStandardItemModel model;

addWindow

StudentData* pointerToData;
QStandardItemModel* pointerToModel;

MainWindow — □ ×

Click Me   ui->tableView

	Name	Last Name	Group
1	John	Smith	204-2
2	Lucy	Andrews	203-1

Add   See Detail

Dialog   ×

Add New Student

First Name: [   ]

Last Name: [   ]

Group: [   ]

History: English: Math:

[   ] [   ] [   ]

Add

```
void MainWindow::on_pushButton_2_clicked()
{
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QStandardItemModel model;

addWindow

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QStandardItemModel* pointerToModel;

MainWindow

Click Me   ui->tableView

	Name	Last Name	Group
1	John	Smith	204-2
2	Lucy	Andrews	203-1

Add   See Detail

Dialog

Add New Student

First Name: Ivan

Last Name: The Terrible

Group: 205

History: English: Math:

7   5   8

Add

StudentData

`std::vector<Student> _data;`

```
data[0]= {John,Smith,204-2,9,10,9};
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QStandardItemModel model;

MainWindow

Click Me   ui->tableView

	Name	Last Name	Group
1	John	Smith	204-2
2	Lucy	Andrews	203-1
3			

0
1
2

Add   See Detail

addWindow

`StudentData* pointerToData;`
`QStandardItemModel* pointerToModel;`

Dialog ✕

Add New Student

First Name: Ivan   **lineEdit**

Last Name: The Terrible **lineEdit_2**

Group: 205   **lineEdit_3**

History: English: Math:

7   5   8

Add

```
void AddWindow::on_pushButton_clicked()
{
    int row = pointerToModel->rowCount(); // 2
    pointerToModel->insertRows(row, 1);

    QModelIndex index = pointerToModel->index(row, 0, QModelIndex());
    pointerToModel->setData(index,ui->lineEdit->text());

    index = pointerToModel->index(row, 1, QModelIndex());
    pointerToModel->setData(index,ui->lineEdit_2->text());

    index = pointerToModel->index(row, 2, QModelIndex());
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StudentData

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QStandardItemModel model;

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StudentData* pointerToData;
QStandardItemModel* pointerToModel;
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Dialog ✕

Add New Student

First Name:	Ivan	**lineEdit**
Last Name:	The Terrible	**lineEdit_2**
Group:	205	**lineEdit_3**

History: English: Math:

7   5   8

Add

MainWindow _ □ ✕

Click Me   ui->tableView

	Name	Last Name	Group
1	John	Smith	204-2
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3	Ivan		

0
1
2

Add   See Detail

```cpp
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QStandardItemModel* pointerToModel;
```

Dialog   ×

Add New Student

First Name: [Ivan]   **lineEdit**

Last Name: [The Terrible] **lineEdit_2**

Group: [205]   **lineEdit_3**

History: English: Math:

[7]   [5]   [8]

[Add]

MainWindow _ □ ×

Click Me   ui->tableView

	Name	Last Name	Group
1	John	Smith	204-2
2	Lucy	Andrews	203-1
3	Ivan	The Terrible	

0
1
2

[Add]   [See Detail]

```
void AddWindow::on_pushButton_clicked()
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StudentData

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StudentData* pointerToData;
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Dialog ✕

Add New Student

First Name:	Ivan	**lineEdit**
Last Name:	The Terrible	**lineEdit_2**
Group:	205	**lineEdit_3**

History: English: Math:

7   5   8

Add

MainWindow _ �口 ✕

Click Me   **ui->tableView**

	Name	Last Name	Group
1	John	Smith	204-2
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3	Ivan	The Terrible	205

0
1
2

Add   See Detail

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}
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StudentData

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QStandardItemModel model;

MainWindow

Click Me   ui->tableView

	Name	Last Name	Group
1	John	Smith	204-2
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3	Ivan	The Terrible	205

0
1
2

[Add]   [See Detail]

addWindow

```
StudentData* pointerToData;
QStandardItemModel* pointerToModel;
```

Dialog   ×

Add New Student

First Name: [Ivan]   lineEdit

Last Name: [The Terrible] lineEdit_2

Group: [205]   lineEdit_3

History: English: Math:

[7]   [5]   [8]

[Add]

We have the new student in the model/view! ☺

But also we would like to update the _data!

```
void AddWindow::on_pushButton_clicked()
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    int row = pointerToModel->rowCount(); // 2
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}
```

StudentData

```
std::vector<Student> _data;
```
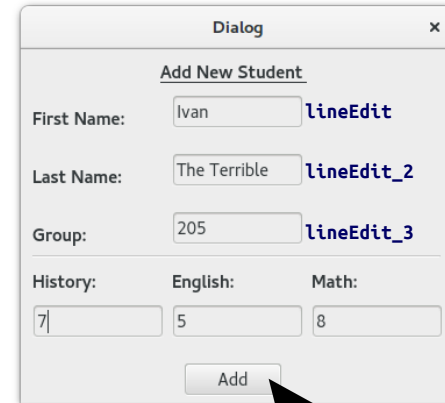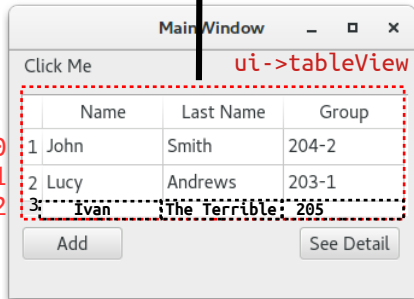
```
_data[0] = {John,Smith,204-2,9,10,9};
_data[1] = {Lucy,Andrews,204-1,8,7,8};
_data[2] = {Ivan,The Terrible,205, , , };
```

```
QObject::connect(model, &QStringListModel::dataChanged, studentData, &StudentData::update);
```

QStandardItemModel model;

```
StudentData* pointerToData;
QStandardItemModel* pointerToModel;
```

addWindow

MainWindow

Click Me   ui->tableView

	Name	Last Name	Group
1	John	Smith	204-2
2	Lucy	Andrews	203-1
3	Ivan	The Terrible	205

0
1
2

Add   See Detail

Dialog   ✕

Add New Student

First Name: Ivan   **lineEdit**

Last Name: The Terrible   **lineEdit_2**

Group: 205   **lineEdit_3**

History: English: Math:

7   5   8

Add

We have the new student in the model/view! ☺
But also we would like to update the _data!

Solution:
Step 1) Use **QObject::connect()** to *update _data,* inserting a new
student, whenever the **model** changed!

```
void AddWindow::on_pushButton_clicked()
{
    int row = pointerToModel->rowCount(); // 2
    pointerToModel->insertRows(row, 1);

    QModelIndex index = pointerToModel->index(row, 0, QModelIndex());
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}
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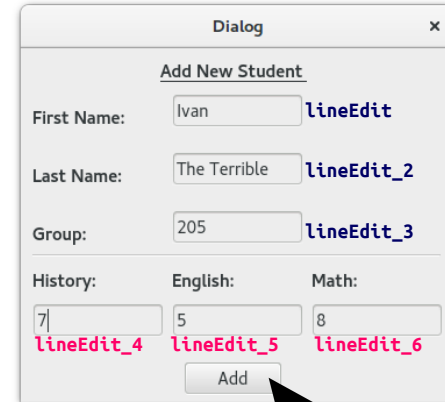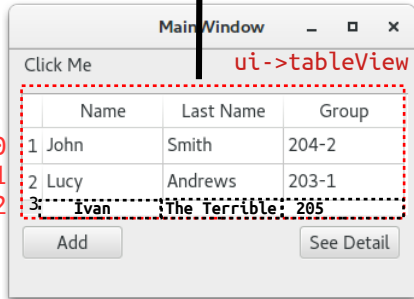
StudentData

```
std::vector<Student> _data;
```

```
_data[0] = {John,Smith,204-2,9,10,9};
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_data[2] = {Ivan,The Terrible,205, 7, 5, 8};
```

addWindow

```
QObject::connect(model, &QStringListModel::dataChanged, studentData, &StudentData::update);
```

QStandardItemModel model;

```
StudentData* pointerToData;
QStandardItemModel* pointerToModel;
```

MainWindow

Click Me   ui->tableView

	Name	Last Name	Group
1	John	Smith	204-2
2	Lucy	Andrews	203-1
3	Ivan	The Terrible	205

0
1
2

Add   See Detail

Dialog

Add New Student

First Name: Ivan   **lineEdit**

Last Name: The Terrible   **lineEdit_2**

Group: 205   **lineEdit_3**

History: English: Math:

7   5   8

lineEdit_4   lineEdit_5   lineEdit_6

Add

We have the new student in the model/view! ☺
But also we would like to update the _data!

Solution:
Step 1) Use **QObject::connect()** to *update* **_data,** inserting a new student, whenever the **model** changed!
Step 2) Use **pointerToData** to manually add the **marks** to the data:

```
int history = ui->lineEdit_4->text().toInt();
int english = ui->lineEdit_5->text().toInt();
int math = ui->lineEdit_6->text().toInt();
pointerToStudentData->setMarks(history,english,math,row);
```
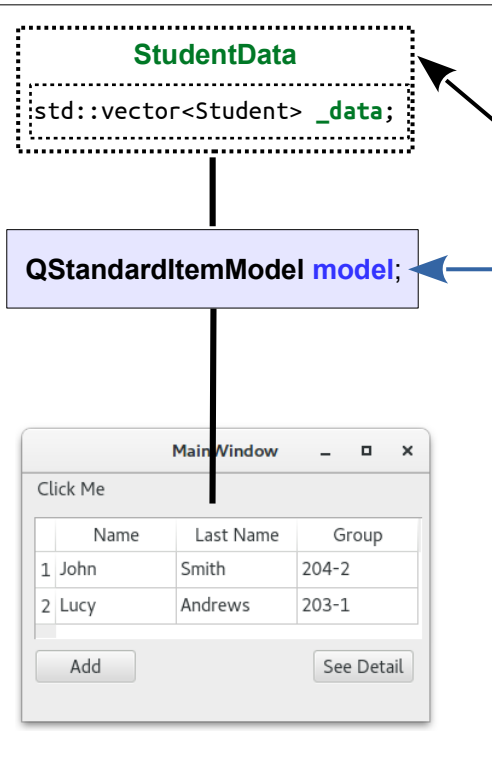
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    index = pointerToModel->index(row, 2, QModelIndex());
    pointerToModel->setData(index,ui->lineEdit_3->text());
}
```

When multiple windows need access to the same objects

pass pointers between windows VS class with static members visible to all windows

Variant 1: pass pointers between windows

mainWindow

```
StudentData
std::vector<Student> _data;
```

`QStandardItemModel model;`

MainWindow

Click Me

	Name	Last Name	Group
1	John	Smith	204-2
2	Lucy	Andrews	203-1

Add   See Detail

addWindow

```
StudentData* pointerToData;
QStandardItemModel* pointerToModel;
```

Dialog ×

Add New Student

First Name: Ivan

Last Name: The Terrible

Group: 205

History: 7   English: 5   Math: 8

Add

Variant 2: class with static members

globalvariables.h

```
struct GlobalVariables
{
        static int data;
        static StudentData studentData;
};
```

```
int GlobalVariables::data = 0;    globalvariables.cpp
```

mainWindow.cpp

```
#include "globalvariables.h"

GlobalVariables::data = 100;
```

detailWindow.cpp

```
#include "globalvariables.h"

std::cout << GlobalVariables::data << std::endl; //100
```