Weather station client

1.0

Generated by Doxygen 1.8.20

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- Ui

  Used to differentiate between the ui class from the designer and the class that implements the functionality.

6.1.1 Detailed Description

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7.1 Ui Namespace Reference

Used to differentiate between the ui class from the designer and the class that implements the functionality.

7.1.1 Detailed Description

Used to differentiate between the ui class from the designer and the class that implements the functionality.

Chapter 8

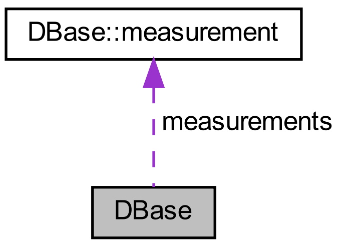
Class Documentation

8.1 DBase Class Reference

The data layer class.

```
#include "dbase.h"
```

Collaboration diagram for DBase:



Classes

- struct measurement

Public Member Functions

- DBase (const QString &hostname, const QString &username, const QString &password, const QString &name)

    Creates the database connection.
- ∼DBase ()

    Destroys the database connection.
- bool isOpen () const

Checks if the connection is made with the database server.
- void getRecentMeasurements (const QString &filter, const QString &date)

  Gets the measurements from the database based on the type and date values.
- void generateSampleData (unsigned amount)

  Generates fake sample data to work with some data.
- double fRand (double fMin, double fMax)

  Generates random value between fMin and fMax.
- double round (double var)

  Round-up a double value.

Public Attributes

- struct DBase::measurement measurements [60]

  Holds 60 samples of measurement data.
- int totalMeasurements

  Holds the data of the total amount of measurements that is currently available.
- int page

  Holds the current page the view layer has to show.
- int range

  As the data shrinks less measurements are available. The page calculates how many measurements on the page are allowed to show.

Private Attributes

- QSqlDatabase m_db

  The database variable which deals with the database server.

8.1.1 Detailed Description

The data layer class.

In the data layer every aspect of communication with the database is managed by this class.

8.1.2 Constructor & Destructor Documentation

8.1.2.1 DBase()

```
DBase::DBase (
            const QString & hostname,
            const QString & username,
            const QString & password,
            const QString & name )
```

Creates the database connection.

The constructor.

Returns

void

8.1.2.2 ∼DBase()

```
DBase::∼DBase ( )
```

Destroys the database connection.

The destructor.

Returns

void

8.1.3 Member Function Documentation

8.1.3.1 fRand()

```
double DBase::fRand (
             double fMin,
             double fMax )
```

Generates random value between fMin and fMax.

Warning

Only for testing purposes.

Precondition

Date must be a valid date in the format of for e.g.: 2020-10-25.

Parameters

fMin	
fMax	

Returns

void

8.1.3.2 generateSampleData()

```
void DBase::generateSampleData (
             unsigned amount )
```

Generates fake sample data to work with some data.

Warning

Only for testing purposes.

Precondition

Date must be a valid date in the format ex: 2020-10-25.

Parameters

amount	

Returns

void

8.1.3.3 getRecentMeasurements()

```
void DBase::getRecentMeasurements (
             const QString & filter,
             const QString & date )
```

Gets the measurements from the database based on the type and date values.

Returns

void

8.1.3.4 isOpen()

```
bool DBase::isOpen ( ) const
```

Checks if the connection is made with the database server.

Returns

boolean

8.1.3.5 round()

```
double DBase::round (
             double var )
```

Round-up a double value.

Parameters

var	

Returns

double

Example:
```
17.66666 * 100 = 1766.66
1766.66 + .5 = 1767.16 for rounding off value
then type cast to int so value is 1767
then divided by 100 so the value converted into 17.67
```

8.1.4 Member Data Documentation

8.1.4.1 measurements

```
struct measurement QString type value date DBase::measurements[60]
```

Holds 60 samples of measurement data.

The data is stored in this array before it is passed down to the chart widget.

8.1.4.2 page

```
int DBase::page
```

Holds the current page the view layer has to show.

The page indicates that 60 measurements may be shown by the view layer.

The documentation for this class was generated from the following files:

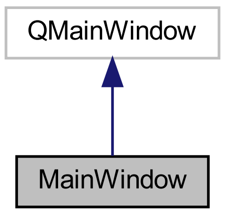
- weerstation/dbase.h
- weerstation/dbase.cpp

8.2 MainWindow Class Reference

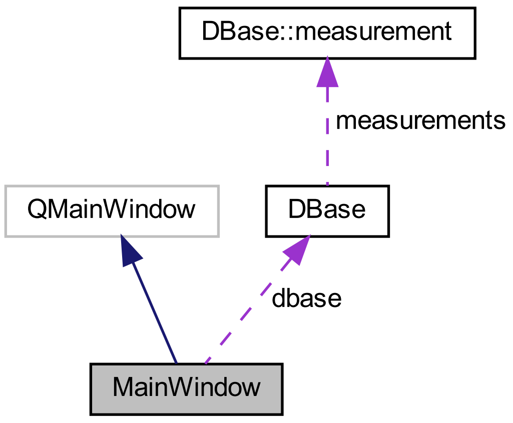
The presentation layer class.

```
#include "mainwindow.h"
```

Inheritance diagram for MainWindow:



Collaboration diagram for MainWindow:



Public Member Functions

- MainWindow (QWidget ∗parent=nullptr)

  Creates the main window.
- ∼MainWindow ()

  Destroys the main window.

Private Slots

- void refreshButton ()

  Updates the charts, buttons and the gridlayout based on the page value.
- void prevButton ()

  Updates the charts, buttons and the gridlayout based on the page value.
- void nextButton ()

  Updates the charts, buttons and the gridlayout based on the page value.

Private Member Functions

- const QString getDate ()

  Gets the date from the dateInputField field.
- void setDate (const QString &date)

  Sets the date from a given string.
- void setupDatabase (const QString &hostname, const QString &username, const QString &password, const QString &name)

  Initializes a database connection.
- void generateSampleData (unsigned amount)

  Generates fake sample data for the measurement tbl.
- void setMeasurements (WChart &chart, const QString &date)

  Gets data from the measurement tbl and puts the data into the chart.
- void setupChart (const QString &titleChart, const QString &type, const QString &titleXAxis, const QString &titleYAxis, qint16 minRangeY, qint16 maxRangeY)

  Initializes a database connection.
- void updateChart (WChart ∗chart)

  Updates the chart with new data and renews the gridlayout.
- void setupButton (const QString &name, const char ∗slot)

  Creates a button with an event trigger.
- void updateButtons ()

  Updates the buttons depending on some states.
- void addItemToGridLayout (QWidget ∗item, unsigned posX, unsigned posY)

  Adds a new widget to the grid layout.
- void removeItemFromGridLayout (unsigned posX, unsigned posY)

  Removes a widget from the grid layout based on the row and column of that item.
- void setupWindow (const QString &windowTitle, QWidget ∗centralWidget)

  Sets a window title and sets the central widget of the main window.

Private Attributes

- QString date

  Stores the current date or date that is coming from the input field.
- QLineEdit ∗ dateInputField

  The widget which behaves as a user input field.
- QVector< WChart ∗ > charts

  A vector type data stores the view of all charts and manages the life-cycle.
- QVector< QPushButton ∗ > buttons

  A vector type data stores all buttons present and manages the life-cycle.
- DBase ∗ dbase

  The database class instance.
- Ui::MainWindow ∗ ui

  The MainWindow class is used to store the mainwindow.ui class generated by the Qt.

8.2.1 Detailed Description

The presentation layer class.

In the presentation layer every aspect of the lifecycle of a widget is managed by this class.

8.2.2 Constructor & Destructor Documentation

8.2.2.1 MainWindow()

```
MainWindow::MainWindow (
            QWidget * parent = nullptr )
```

Creates the main window.

The constructor.

Returns

void

8.2.2.2 ∼MainWindow()

```
MainWindow::∼MainWindow ( )
```

Destroys the main window.

The destructor.

Returns

void

8.2.3 Member Function Documentation

8.2.3.1 addItemToGridLayout()

```
void MainWindow::addItemToGridLayout (
            QWidget * item,
            unsigned posX,
            unsigned posY ) [private]
```

Adds a new widget to the grid layout.

Parameters

item	
posX	
posY	

Returns

void

8.2.3.2 generateSampleData()

```
void MainWindow::generateSampleData (
            unsigned amount )  [private]
```

Generates fake sample data for the measurement tbl.

Parameters

amount	

Returns

void

8.2.3.3 getDate()

```
const QString MainWindow::getDate ( )  [private]
```

Gets the date from the dateInputField field.

Returns

const QString

8.2.3.4 nextButton

```
void MainWindow::nextButton ( )  [private], [slot]
```

Updates the charts, buttons and the gridlayout based on the page value.

Returns

void

8.2.3.5 prevButton

```
void MainWindow::prevButton ( )  [private], [slot]
```

Updates the charts, buttons and the gridlayout based on the page value.

Returns

void

8.2.3.6 refreshButton

```
MainWindow::refreshButton ( )  [private], [slot]
```

Updates the charts, buttons and the gridlayout based on the page value.

Returns

void

8.2.3.7 removeItemFromGridLayout()

```
void MainWindow::removeItemFromGridLayout (
            unsigned posX,
            unsigned posY )  [private]
```

Removes a widget from the grid layout based on the row and column of that item.

Parameters

posX	
posY	

Returns

void

8.2.3.8 setDate()

```
void MainWindow::setDate (
            const QString & date )  [private]
```

Sets the date from a given string.

Parameters

date	

Returns

void

8.2.3.9 setMeasurements()

```
void MainWindow::setMeasurements (
            WChart & chart,
            const QString & date )  [private]
```

Gets data from the measurement tbl and puts the data into the chart.

Precondition

The value of amount must not be negative

Parameters

chart	
date	

Returns

void

8.2.3.10 setupButton()

```
void MainWindow::setupButton (
            const QString & name,
            const char * slot )  [private]
```

Creates a button with an event trigger.

Parameters

name	
slot	

Returns

void

8.2.3.11 setupChart()

```
void MainWindow::setupChart (
            const QString & titleChart,
            const QString & type,
            const QString & titleXAxis,
            const QString & titleYAxis,
            qint16 minRangeY,
            qint16 maxRangeY )  [private]
```

Initializes a database connection.

Parameters

titleChart	
type	
titleXAxis	
titleYAxis	
minRangeY	
maxRangeY	

Returns

void

8.2.3.12 setupDatabase()

```
void MainWindow::setupDatabase (
            const QString & hostname,
            const QString & username,
            const QString & password,
            const QString & name )  [private]
```

Initializes a database connection.

Parameters

hostname	
username	
password	
name	

Returns

void

8.2.3.13 setupWindow()

```
void MainWindow::setupWindow (
            const QString & windowTitle,
            QWidget * centralWidget )  [private]
```

Sets a window title and sets the central widget of the main window.

Parameters

windowTitle	
centralWidget	

Returns

void

8.2.3.14 updateButtons()

```
void MainWindow::updateButtons ( )  [private]
```

Updates the buttons depending on some states.

Returns

void

8.2.3.15 updateChart()

```
void MainWindow::updateChart (
            WChart * chart )  [private]
```

Updates the chart with new data and renews the gridlayout.

Parameters

chart	

Returns

void

8.2.4 Member Data Documentation

8.2.4.1 dateInputField

```
QLineEdit * MainWindow::dateInputField  [private]
```

The widget which behaves as a user input field.

The user input field where a date could be specified.

8.2.4.2 dbase

```
DBase * MainWindow::dbase  [private]
```

The database class instance.

Manages all income/outcome traffic with the database server.

8.2.4.3 ui

```
Ui::MainWindow * MainWindow::ui  [private]
```

The MainWindow class is used to store the mainwindow.ui class generated by the Qt.

Manages the design view of the application window.

The documentation for this class was generated from the following files:

- weerstation/mainwindow.h
- weerstation/mainwindow.cpp

8.3 DBase::measurement Struct Reference

Public Attributes

- QString type

  Stores the type of the measurement data.
- QString value

  Stores the value of the measurement data.
- QString date

  Stores the date of the measurement data.

The documentation for this struct was generated from the following file:

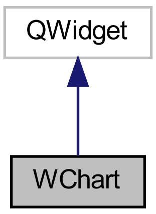
- weerstation/dbase.h

8.4 WChart Class Reference

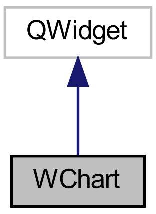
The logic layer class.

```
#include "wchart.h"
```

Inheritance diagram for WChart:



Collaboration diagram for WChart:



Public Member Functions

- WChart (QWidget ∗parent=nullptr, const QString &titleChart="", const QString &titleXAxis="", const QString &titleYAxis="")

  Creates a basic chart.
- ∼WChart ()

  Destroys the chart widget.
- void render ()

  Renders the widget.
- void setRangeYAxis (unsigned min, unsigned max)

  Sets the range of Y-axis.
- void setAxesTickCount (unsigned amount)

  Sets the amount of steps in the x-axis and y-axis.
- void setData (const qreal &x, const qreal &y)

Sets the data points on the graph.
- void setType (const QString &type)

  Sets the type.
- const QString & getType ()

  Gets the type.
- const QString & getTitleChart ()

  Gets the main title.
- const QString & getTitleXAxis ()

  Gets the title of x-axis.
- const QString & getTitleYAxis ()

  Gets the title of y-axis.
- const qint16 & getMinRangeYAxis ()

  Gets the starting range of the y-axis.
- const qint16 & getMaxRangeYAxis ()

  Gets the ending range of the y-axis.

Public Attributes

- QtCharts::QChartView ∗ chartView

  The layer of the widget that is going to be rendered on the screen.

Private Attributes

- QtCharts::QValueAxis ∗ valueAxisY

  The layer that is responsible for showing the data on the Y-axis.
- QtCharts::QDateTimeAxis ∗ valueAxisX

  The layer that is responsible for showing the data on the X-axis.
- QtCharts::QChart ∗ chart

  The chart stores and keeps track of all data.
- QtCharts::QLineSeries ∗ series

  Series stores all data points that is going to be presented by valueAxisX and valueAxisY.
- QString type

  Stores the type.
- QString titleChart

  Stores the main title.
- QString titleXAxis

  Stores the title of the x-axis.
- QString titleYAxis

  Stores the title of the y-axis.
- qint16 minRange

  Stores the minimum range of the y-axis.
- qint16 maxRange

  Stores the maximum range of the y-axis.

8.4.1 Detailed Description

The logic layer class.

In the logic layer all logic of the created charts and life-cycle are managed by this class.

8.4.2 Constructor & Destructor Documentation

8.4.2.1 WChart()

```
WChart::WChart (
            QWidget * parent = nullptr,
            const QString & titleChart = "",
            const QString & titleXAxis = "",
            const QString & titleYAxis = "" )  [explicit]
```

Creates a basic chart.

The constructor.

Parameters

parent	
titleChart	
titleXAxis	
titleYAxis	

Returns

void

8.4.2.2 ∼WChart()

```
WChart::∼WChart ( )
```

Destroys the chart widget.

The destructor.

Returns

void

8.4.3 Member Function Documentation

8.4.3.1 getMaxRangeYAxis()

```
const qint16 & WChart::getMaxRangeYAxis ( )
```

Gets the ending range of the y-axis.

Returns

const qint16&

8.4.3.2 getMinRangeYAxis()

```
const qint16 & WChart::getMinRangeYAxis ( )
```

Gets the starting range of the y-axis.

Returns

const qint16&

8.4.3.3 getTitleChart()

```
const QString & WChart::getTitleChart ( )
```

Gets the main title.

Returns

const QString&

8.4.3.4 getTitleXAxis()

```
const QString & WChart::getTitleXAxis ( )
```

Gets the title of x-axis.

Returns

const QString&

8.4.3.5 getTitleYAxis()

```
const QString & WChart::getTitleYAxis ( )
```

Gets the title of y-axis.

Returns

const QString&

8.4.3.6 getType()

```
const QString & WChart::getType ( )
```

Gets the type.

Returns

const QString&

8.4.3.7 render()

```
void WChart::render ( )
```

Renders the widget.

All aditional part of the widget like updates are managed my this method.

Returns

void

8.4.3.8 setAxesTickCount()

```
void WChart::setAxesTickCount (
             unsigned amount )
```

Sets the amount of steps in the x-axis and y-axis.

Returns

void

8.4.3.9 setData()

```
void WChart::setData (
            const qreal & x,
            const qreal & y )
```

Sets the data points on the graph.

Returns

void

8.4.3.10 setRangeYAxis()

```
void WChart::setRangeYAxis (
            unsigned min,
            unsigned max )
```

Sets the range of Y-axis.

Returns

void

8.4.3.11 setType()

```
void WChart::setType (
            const QString & type )
```

Sets the type.

This type is important because the method getRecentMeasurements(const QString& filter, const QString& date) database needs this as a filter input to get the corresponding data.

Note

Needs a valid type which occurs in the table of the database in order to retreive data from the database.

Parameters

type	

Returns

void

The documentation for this class was generated from the following files:

- weerstation/wchart.h
- weerstation/wchart.cpp

Chapter 9

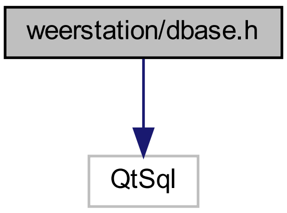
File Documentation

9.1 weerstation/dbase.h File Reference

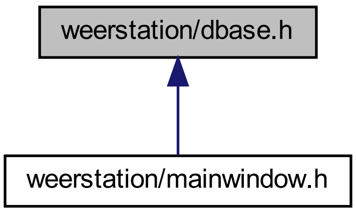
The data layer.

```
#include <QtSql>
```

Include dependency graph for dbase.h:



This graph shows which files directly or indirectly include this file:



Classes

- class DBase

  The data layer class.
- struct DBase::measurement

9.1.1 Detailed Description

The data layer.

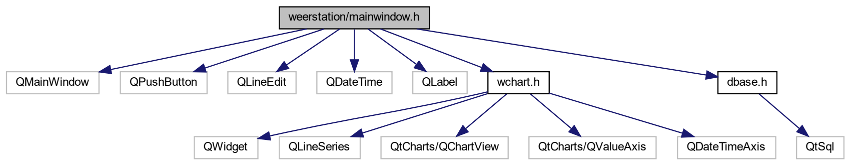
Author

Bedirhan Dincer

9.2 weerstation/mainwindow.h File Reference

The presentation layer.

```
#include <QMainWindow>
#include <QPushButton>
#include <QLineEdit>
#include <QDateTime>
#include <QLabel>
#include <wchart.h>
#include <dbase.h>
```
Include dependency graph for mainwindow.h:



Classes

- class MainWindow

  The presentation layer class.

Namespaces

- Ui

  Used to differentiate between the ui class from the designer and the class that implements the functionality.

9.2.1 Detailed Description

The presentation layer.

Author

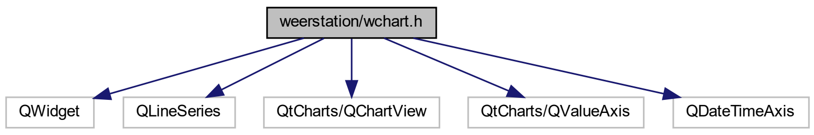
Bedirhan Dincer

9.3 weerstation/wchart.h File Reference

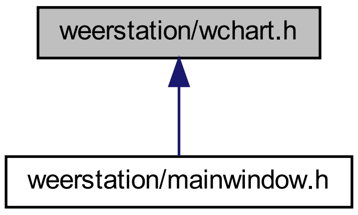
The logic layer.

```
#include <QWidget>
#include <QLineSeries>
#include <QtCharts/QChartView>
#include <QtCharts/QValueAxis>
#include <QDateTimeAxis>
```

Include dependency graph for wchart.h:



This graph shows which files directly or indirectly include this file:



Classes

- class WChart

  The logic layer class.

9.3.1 Detailed Description

The logic layer.

Author

Bedirhan Dincer

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