QT CMake课程

1. QT课程更新

1.1. 1 cmake qt环境准备

1.1.1. QT

1.1.2. VS2022

1.1.3. qt addone

旧项目升级

1.1.4. cmake

生成vs 后打开

1.2. 2 免费部分

1.2.1. 不讲环境 将一个最简单的示例

1.2.2. 前置条件

vs2022 c++安装完整

1.3. 3 自动编译

1.3.1. 输出

1.3.2. release 和Debug

1.3.3. 去掉控制台 WIN32

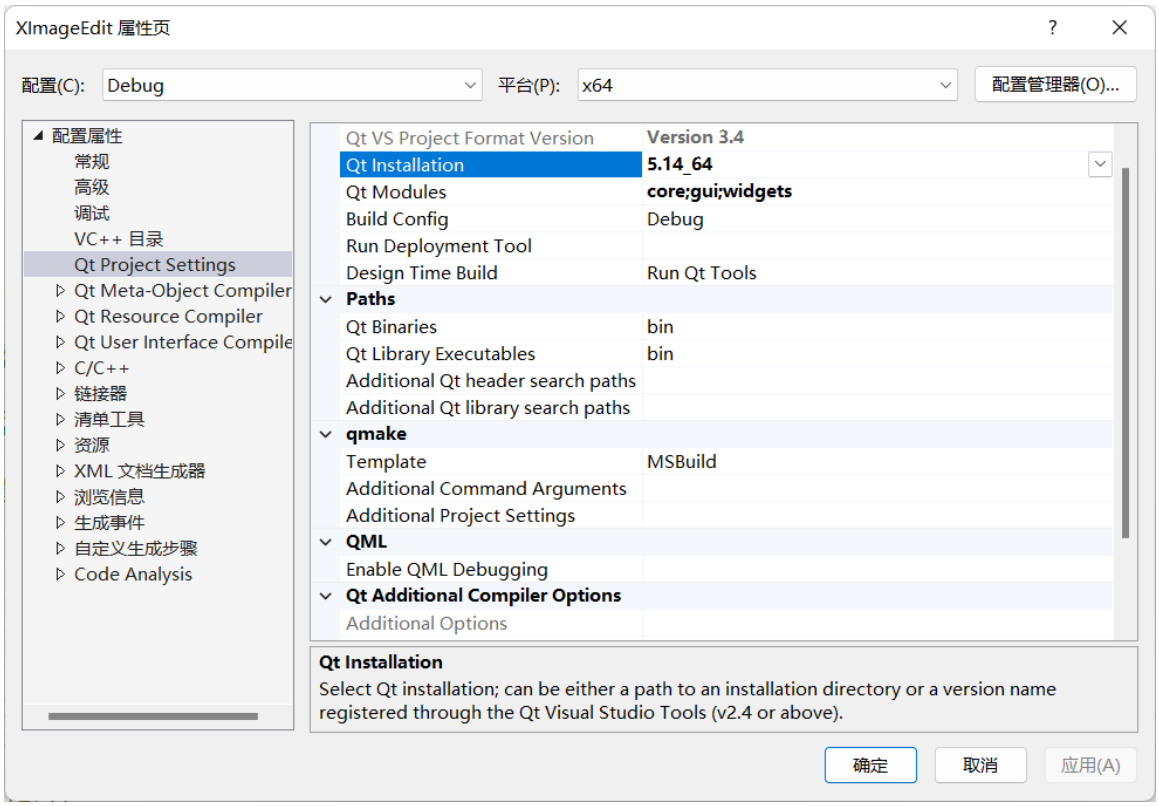
1.4. 4 编译课程示例项目

2. CMake课程更新

2.1. 1 cmake qt环境准备

2.1.1. QT

2.1.2. VS2022



2.1.3. qt addone

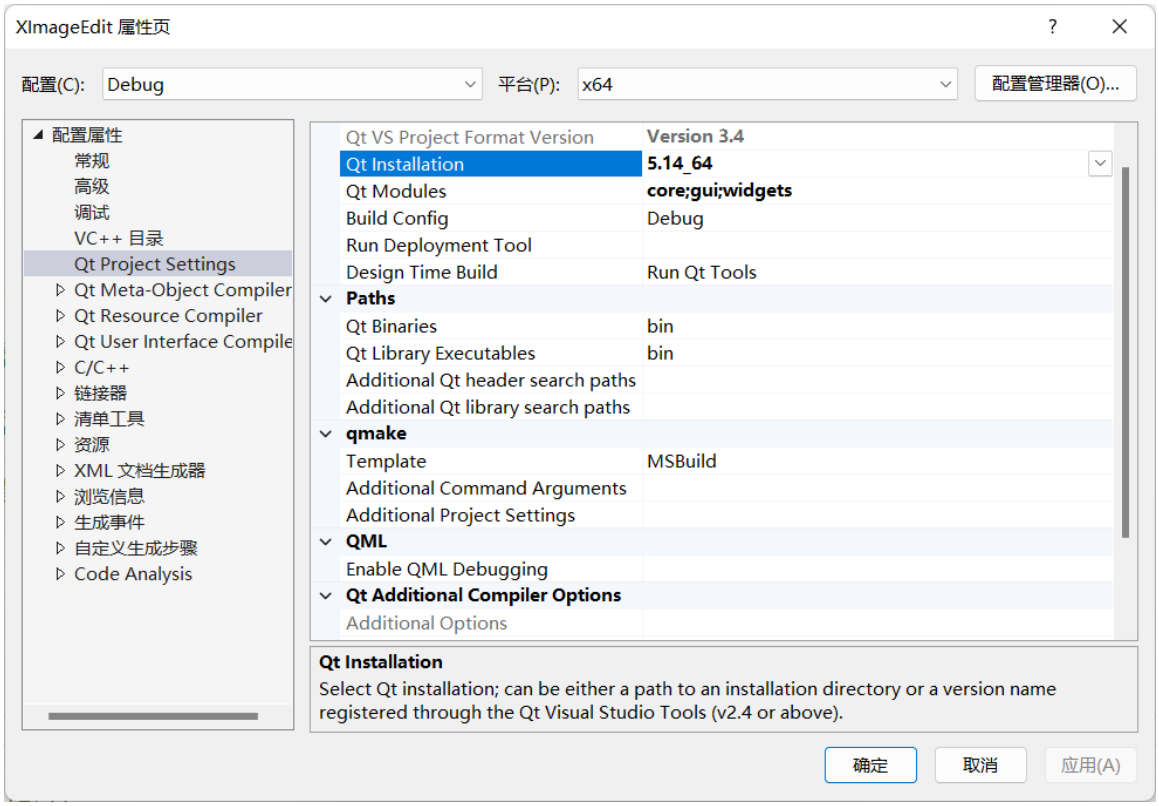
旧项目升级

2.1.4. cmake

生成vs 后打开

2.2. 2 免费部分

2.2.1. 不讲环境 将一个最简单的示例



3.1.3. qt addone

旧项目升级

3.1.4. cmake

生成vs 后打开

3.1.5. 下载

https://pan.baidu.com/s/12UfEFzR9ckAJdHOW6JjYJg?pwd=1234

3.2. qt5 + cmake编程示例 （免费）

3.2.1. QT & CMake项目说明

3.2.2. 项目代码

qtcmake.h

```
#pragma once

#include <QtWidgets/QWidget>
#include "ui_qtcmake.h"

class QtCmake : public QWidget
{
   Q_OBJECT

public:
   QtCmake(QWidget *parent = nullptr);
   ~QtCmake();
public slots:
   void TestCMake();
private:
   Ui::QtCmakeClass ui;
};
```

qtcmake.cpp

```
#include "qtcmake.h"
#include <QMessageBox>
QtCmake::QtCmake(QWidget *parent)
   : QWidget(parent)
{
   ui.setupUi(this);
}

QtCmake::~QtCmake()
{}
void QtCmake::TestCMake()
{
```

```
    QMessageBox::information(this, "", "Test CMake");
  }
```

main.cpp

```
  #include "qtcmake.h"
  #include <QtWidgets/QApplication>

  int main(int argc, char *argv[])
  {
    QApplication a(argc, argv);
    QtCmake w;
    w.show();
    return a.exec();
  }
```

qtcmake.ui

```
  <?xml version="1.0" encoding="UTF-8"?>
  <ui version="4.0">
   <class>QtCmakeClass</class>
   <widget class="QWidget" name="QtCmakeClass">
    <property name="geometry">
     <rect>
      <x>0</x>
      <y>0</y>
      <width>875</width>
      <height>600</height>
     </rect>
    </property>
    <property name="windowTitle">
     <string>QtCmake</string>
    </property>
```

```
 <property name="styleSheet">
  <string notr="true"/>
 </property>
 <widget class="QPushButton" name="pushButton">
  <property name="geometry">
   <rect>
    <x>210</x>
    <y>130</y>
    <width>481</width>
    <height>301</height>
   </rect>
  </property>
  <property name="styleSheet">
   <string notr="true">font: 22pt &amp;quot;黑体&amp;quot;;
background-image: url(:/QtCmake/cmake_cpp.jpg);</string>
  </property>
  <property name="text">
   <string>Test CMake</string>
  </property>
 </widget>
</widget>
<layoutdefault spacing="6" margin="11"/>
<resources>
 <include location="qtcmake.qrc"/>
</resources>
<connections>
 <connection>
  <sender>pushButton</sender>
  <signal>clicked()</signal>
  <receiver>QtCmakeClass</receiver>
  <slot>TestCMake()</slot>
```

```
      <hints>
       <hint type="sourcelabel">
        <x>601</x>
        <y>340</y>
       </hint>
       <hint type="destinationlabel">
        <x>1241</x>
        <y>410</y>
       </hint>
      </hints>
     </connection>
    </connections>
    <slots>
     <slot>TestCMake()</slot>
    </slots>
   </ui>
```

qtcmake.qrc

```
   <RCC>
    <qresource prefix="QtCmake">
     <file>cmake_cpp.jpg</file>
    </qresource>
   </RCC>
```

CMakeLists.txt

```
   cmake_minimum_required(VERSION 3.20)
   project(qt_cmake)

   # cmake -S . -B build -DQT5=J:/Qt/Qt5.14.2/5.14.2/msvc2017_64
   # cmake -S . -B build -DQT5=J:/Qt/Qt5.14.2/5.14.2/msvc2017_64 -
   DCMAKE_INSTALL_PREFIX=out
```

```
# cmake -S . -B build -
DQt5_DIR=J:/Qt/Qt5.14.2/5.14.2/msvc2017_64/lib/cmake/Qt5/
# J:\Qt\Qt5.14.2\5.14.2\msvc2017_64\bin\windeployqt.exe
if(NOT Qt5_DIR)
   set(Qt5_DIR ${QT5}/lib/cmake/Qt5)
endif()
set(windeployqt ${QT5}/bin/windeployqt.exe)
if(Qt5)
   set(QT5 ${Qt5})
endif()


message("Qt5_DIR = ${Qt5_DIR}")
file(GLOB SOURCE "*.cpp" "*.c")
file(GLOB HEAD "*.hpp" "*.h")
file(GLOB QT "*.uic" "*.qrc")

set(CMAKE_AUTOMOC ON)
set(CMAKE_AUTORCC ON)
set(CMAKE_AUTOUIC ON)

add_executable(${PROJECT_NAME} WIN32 ${SOURCE} ${HEAD} ${QT})
find_package(Qt5 COMPONENTS Widgets REQUIRED)
target_link_libraries(${PROJECT_NAME}
Qt5::Widgets
)

add_custom_command(OUTPUT test_output
WORKING_DIRECTORY ${CMAKE_BINARY_DIR}
DEPENDS ${PROJECT_NAME}
COMMAND ${windeployqt} $<TARGET_FILE:${PROJECT_NAME}>
```

```
    COMMENT "test for add_custom_command")

    add_custom_target(copy_qt
    COMMAND ${windeployqt} $<TARGET_FILE:${PROJECT_NAME}>
    )

    message("CMAKE_INSTALL_PREFIX = ${CMAKE_INSTALL_PREFIX}")

    install(TARGETS ${PROJECT_NAME}
        CONFIGURATIONS Debug
        RUNTIME DESTINATION Debug/bin)
    install(CODE "message(hello)")
    install(CODE "message(${CMAKE_INSTALL_PREFIX})")

    install(CODE "execute_process(COMMAND
    ${windeployqt}
    ${CMAKE_INSTALL_PREFIX}/Debug/bin/$<TARGET_FILE_NAME:${PROJECT_N
    AME}>
    WORKING_DIRECTORY ${CMAKE_BINARY_DIR}
    )")
```

3.2.3. moc 信号槽代码生成

```
  set(CMAKE_AUTOMOC ON)
```

3.2.4. uic 界面代码生成

```
  set(CMAKE_AUTOUIC ON)

    file(GLOB QT "*.uic" "*.qrc")
```

3.2.5. rcc 资源代码生成

```
  set(CMAKE_AUTORCC ON)
```

3.2.6. 加载qt库和头文件

```
cmake -S . -B build -
DQt5_DIR=J:/Qt/Qt5.14.2/5.14.2/msvc2017_64/lib/cmake/Qt5/

find_package(Qt5 COMPONENTS Widgets REQUIRED)

target_link_libraries(${PROJECT_NAME}
Qt5::Widgets
)
```

3.3. QT区分32位和64位程序

3.3.1. cmake -S . -B build -DQt5_DIR=J:/Qt/Qt5.14.2/5.14.2/msvc2017/lib/cmake/Qt5/ -A Win32

3.3.2. cmake -S . -B build -DQt5_DIR=J:/Qt/Qt5.14.2/5.14.2/msvc2017_64/lib/cmake/Qt5/ -A x64

3.4. QT区分Debug和Release版本

3.4.1. cmake --build build --config Debug

3.4.2. cmake --build build --config Release

3.5. 自动复制QT依赖库

3.5.1. Win32

```
J:\Qt\Qt5.14.2\5.14.2\msvc2017\bin\windeployqt.exe
build/Release/qt_cmake.exe
```

3.5.2. x64

```
J:\Qt\Qt5.14.2\5.14.2\msvc2017_64\bin\windeployqt.exe
build/Debug/qt_cmake.exe
```

3.6. XImageEdit使用cmake编译

3.6.1. file(GLOB RC "*.rc")

3.6.2. add_executable(${PROJECT_NAME} WIN32 ${SOURCE} ${HEAD} ${QT} ${RC})

4. CMake课程更新

4.1. qt5 + cmake编程示例 （免费）

4.1.1. QT & CMake项目说明

4.1.2. 项目代码

qtcmake.h

```
#pragma once

#include <QtWidgets/QWidget>
#include "ui_qtcmake.h"

class QtCmake : public QWidget
{
  Q_OBJECT

public:
  QtCmake(QWidget *parent = nullptr);
  ~QtCmake();
public slots:
  void TestCMake();
private:
  Ui::QtCmakeClass ui;
};
```

qtcmake.cpp

```
#include "qtcmake.h"
#include <QMessageBox>
QtCmake::QtCmake(QWidget *parent)
    : QWidget(parent)
{
    ui.setupUi(this);
}

QtCmake::~QtCmake()
{}
void QtCmake::TestCMake()
{
    QMessageBox::information(this, "", "Test CMake");
}
```

main.cpp

```
#include "qtcmake.h"
#include <QtWidgets/QApplication>

int main(int argc, char *argv[])
{
    QApplication a(argc, argv);
    QtCmake w;
    w.show();
    return a.exec();
}
```

qtcmake.ui

```
<?xml version="1.0" encoding="UTF-8"?>
<ui version="4.0">
 <class>QtCmakeClass</class>
 <widget class="QWidget" name="QtCmakeClass">
  <property name="geometry">
   <rect>
    <x>0</x>
    <y>0</y>
    <width>875</width>
    <height>600</height>
   </rect>
  </property>
  <property name="windowTitle">
   <string>QtCmake</string>
  </property>
  <property name="styleSheet">
   <string notr="true"/>
  </property>
  <widget class="QPushButton" name="pushButton">
   <property name="geometry">
    <rect>
     <x>210</x>
     <y>130</y>
     <width>481</width>
     <height>301</height>
    </rect>
   </property>
   <property name="styleSheet">
    <string notr="true">font: 22pt &amp;quot;黑体&amp;quot;;
background-image: url(:/QtCmake/cmake_cpp.jpg);</string>
   </property>
```

```
  <property name="text">
   <string>Test CMake</string>
  </property>
 </widget>
</widget>
<layoutdefault spacing="6" margin="11"/>
<resources>
 <include location="qtcmake.qrc"/>
</resources>
<connections>
 <connection>
  <sender>pushButton</sender>
  <signal>clicked()</signal>
  <receiver>QtCmakeClass</receiver>
  <slot>TestCMake()</slot>
  <hints>
   <hint type="sourcelabel">
    <x>601</x>
    <y>340</y>
   </hint>
   <hint type="destinationlabel">
    <x>1241</x>
    <y>410</y>
   </hint>
  </hints>
 </connection>
</connections>
<slots>
 <slot>TestCMake()</slot>
</slots>
</ui>
```

qtcmake.qrc

```
<RCC>
 <qresource prefix="QtCmake">
  <file>cmake_cpp.jpg</file>
 </qresource>
</RCC>
```

CMakeLists.txt

```
cmake_minimum_required(VERSION 3.20)
project(qt_cmake)

# cmake -S . -B build -DQT5=J:/Qt/Qt5.14.2/5.14.2/msvc2017_64
# cmake -S . -B build -DQT5=J:/Qt/Qt5.14.2/5.14.2/msvc2017_64 -
DCMAKE_INSTALL_PREFIX=out
# cmake -S . -B build -
DQt5_DIR=J:/Qt/Qt5.14.2/5.14.2/msvc2017_64/lib/cmake/Qt5/
# J:\Qt\Qt5.14.2\5.14.2\msvc2017_64\bin\windeployqt.exe
if(NOT Qt5_DIR)
   set(Qt5_DIR ${QT5}/lib/cmake/Qt5)
endif()
set(windeployqt ${QT5}/bin/windeployqt.exe)
if(Qt5)
   set(QT5 ${Qt5})
endif()


message("Qt5_DIR = ${Qt5_DIR}")
file(GLOB SOURCE "*.cpp" "*.c")
file(GLOB HEAD "*.hpp" "*.h")
file(GLOB QT "*.uic" "*.qrc")
```

```
set(CMAKE_AUTOMOC ON)
set(CMAKE_AUTORCC ON)
set(CMAKE_AUTOUIC ON)

add_executable(${PROJECT_NAME} WIN32 ${SOURCE} ${HEAD} ${QT})
find_package(Qt5 COMPONENTS Widgets REQUIRED)
target_link_libraries(${PROJECT_NAME}
Qt5::Widgets
)

add_custom_command(OUTPUT test_output
WORKING_DIRECTORY ${CMAKE_BINARY_DIR}
DEPENDS ${PROJECT_NAME}
COMMAND ${windeployqt} $<TARGET_FILE:${PROJECT_NAME}>
COMMENT "test for add_custom_command")

add_custom_target(copy_qt
COMMAND ${windeployqt} $<TARGET_FILE:${PROJECT_NAME}>
)

message("CMAKE_INSTALL_PREFIX = ${CMAKE_INSTALL_PREFIX}")

install(TARGETS ${PROJECT_NAME}
    CONFIGURATIONS Debug
    RUNTIME DESTINATION Debug/bin)
install(CODE "message(hello)")
install(CODE "message(${CMAKE_INSTALL_PREFIX})")

install(CODE "execute_process(COMMAND
${windeployqt}
```

${CMAKE_INSTALL_PREFIX}/Debug/bin/$<TARGET_FILE_NAME:${PROJECT_NAME}>

WORKING_DIRECTORY ${CMAKE_BINARY_DIR}

)")

4.1.3. moc 信号槽代码生成

set(CMAKE_AUTOMOC ON)

4.1.4. uic 界面代码生成

set(CMAKE_AUTOUIC ON)

file(GLOB QT "*.uic" "*.qrc")

4.1.5. rcc 资源代码生成

set(CMAKE_AUTORCC ON)

4.1.6. 加载qt库和头文件

cmake -S . -B build -
DQt5_DIR=J:/Qt/Qt5.14.2/5.14.2/msvc2017_64/lib/cmake/Qt5/

find_package(Qt5 COMPONENTS Widgets REQUIRED)

target_link_libraries(${PROJECT_NAME}
Qt5::Widgets
)

4.2. QT区分32位和64位程序

4.2.1. cmake -S . -B build -
DQt5_DIR=J:/Qt/Qt5.14.2/5.14.2/msvc2017/lib/cmake/Qt5/ -A Win32

4.2.2. cmake -S . -B build -
DQt5_DIR=J:/Qt/Qt5.14.2/5.14.2/msvc2017_64/lib/cmake/Qt5/ -A x64

4.3. QT区分Debug和Release版本

4.3.1. cmake --build build --config Debug

4.3.2. cmake --build build --config Release

4.4. 自动复制QT依赖库

4.4.1. Win32

J:\Qt\Qt5.14.2\5.14.2\msvc2017\bin\windeployqt.exe
build/Release/qt_cmake.exe

4.4.2. x64

J:\Qt\Qt5.14.2\5.14.2\msvc2017_64\bin\windeployqt.exe
build/Debug/qt_cmake.exe

4.5. cmake install QT项目和依赖动态库

4.5.1. J:\Qt\Qt5.14.2\5.14.2\msvc2017_64\bin\windeployqt.exe

4.5.2. install(TARGETS ${PROJECT_NAME}
CONFIGURATIONS Debug Release
RUNTIME DESTINATION
${CMAKE_INSTALL_PREFIX}/${CMAKE_VS_PLATFORM_NAME}/bin)

install(CODE "execute_process(COMMAND
${windeployqt}
${CMAKE_INSTALL_PREFIX}/${CMAKE_VS_PLATFORM_NAME}/bin/$<TARGET_FIL
E_NAME:${PROJECT_NAME}>

```
WORKING_DIRECTORY ${CMAKE_BINARY_DIR}
)")
```

5. QT CMake课程大纲

5.1. qt5 + cmake编程示例

5.1.1. 项目代码

qtcmake.h

```
#pragma once

#include <QtWidgets/QWidget>
#include "ui_qtcmake.h"

class QtCmake : public QWidget
{
  Q_OBJECT

public:
  QtCmake(QWidget *parent = nullptr);
  ~QtCmake();
public slots:
  void TestCMake();
private:
  Ui::QtCmakeClass ui;
};
```

qtcmake.cpp

```
#include "qtcmake.h"
#include <QMessageBox>
```

```
QtCmake::QtCmake(QWidget *parent)
    : QWidget(parent)
{
    ui.setupUi(this);
}

QtCmake::~QtCmake()
{}
void QtCmake::TestCMake()
{
    QMessageBox::information(this, "", "Test CMake");
}
```

main.cpp

```
#include "qtcmake.h"
#include <QtWidgets/QApplication>

int main(int argc, char *argv[])
{
    QApplication a(argc, argv);
    QtCmake w;
    w.show();
    return a.exec();
}
```

qtcmake.ui

```
<?xml version="1.0" encoding="UTF-8"?>
<ui version="4.0">
 <class>QtCmakeClass</class>
 <widget class="QWidget" name="QtCmakeClass">
  <property name="geometry">
```

```
 <rect>
  <x>0</x>
  <y>0</y>
  <width>875</width>
  <height>600</height>
 </rect>
</property>
<property name="windowTitle">
 <string>QtCmake</string>
</property>
<property name="styleSheet">
 <string notr="true"/>
</property>
<widget class="QPushButton" name="pushButton">
 <property name="geometry">
  <rect>
   <x>210</x>
   <y>130</y>
   <width>481</width>
   <height>301</height>
  </rect>
 </property>
 <property name="styleSheet">
  <string notr="true">font: 22pt &amp;quot;黑体&amp;quot;;
background-image: url(:/QtCmake/cmake_cpp.jpg);</string>
 </property>
 <property name="text">
  <string>Test CMake</string>
 </property>
</widget>
</widget>
```

```
 <layoutdefault spacing="6" margin="11"/>
 <resources>
  <include location="qtcmake.qrc"/>
 </resources>
 <connections>
  <connection>
   <sender>pushButton</sender>
   <signal>clicked()</signal>
   <receiver>QtCmakeClass</receiver>
   <slot>TestCMake()</slot>
   <hints>
    <hint type="sourcelabel">
     <x>601</x>
     <y>340</y>
    </hint>
    <hint type="destinationlabel">
     <x>1241</x>
     <y>410</y>
    </hint>
   </hints>
  </connection>
 </connections>
 <slots>
  <slot>TestCMake()</slot>
 </slots>
</ui>
```

qtcmake.qrc

```
<RCC>
  <qresource prefix="QtCmake">
    <file>cmake_cpp.jpg</file>
```

```
  </qresource>
</RCC>
```

CMakeLists.txt

```
cmake_minimum_required(VERSION 3.20)
project(qt_cmake)

# cmake -S . -B build -DQT5=J:/Qt/Qt5.14.2/5.14.2/msvc2017_64
# cmake -S . -B build -DQT5=J:/Qt/Qt5.14.2/5.14.2/msvc2017_64 -
DCMAKE_INSTALL_PREFIX=out
# cmake -S . -B build -
DQt5_DIR=J:/Qt/Qt5.14.2/5.14.2/msvc2017_64/lib/cmake/Qt5/
# J:\Qt\Qt5.14.2\5.14.2\msvc2017_64\bin\windeployqt.exe
if(NOT Qt5_DIR)
   set(Qt5_DIR ${QT5}/lib/cmake/Qt5)
endif()
set(windeployqt ${QT5}/bin/windeployqt.exe)
if(Qt5)
   set(QT5 ${Qt5})
endif()


message("Qt5_DIR = ${Qt5_DIR}")
file(GLOB SOURCE "*.cpp" "*.c")
file(GLOB HEAD "*.hpp" "*.h")
file(GLOB QT "*.uic" "*.qrc")

set(CMAKE_AUTOMOC ON)
set(CMAKE_AUTORCC ON)
set(CMAKE_AUTOUIC ON)
```

```
add_executable(${PROJECT_NAME} WIN32 ${SOURCE} ${HEAD} ${QT})
find_package(Qt5 COMPONENTS Widgets REQUIRED)
target_link_libraries(${PROJECT_NAME}
Qt5::Widgets
)

add_custom_command(OUTPUT test_output
WORKING_DIRECTORY ${CMAKE_BINARY_DIR}
DEPENDS ${PROJECT_NAME}
COMMAND ${windeployqt} $<TARGET_FILE:${PROJECT_NAME}>
COMMENT "test for add_custom_command")

add_custom_target(copy_qt
COMMAND ${windeployqt} $<TARGET_FILE:${PROJECT_NAME}>
)

message("CMAKE_INSTALL_PREFIX = ${CMAKE_INSTALL_PREFIX}")

install(TARGETS ${PROJECT_NAME}
    CONFIGURATIONS Debug
    RUNTIME DESTINATION Debug/bin)
install(CODE "message(hello)")
install(CODE "message(${CMAKE_INSTALL_PREFIX})")

install(CODE "execute_process(COMMAND
${windeployqt}
${CMAKE_INSTALL_PREFIX}/Debug/bin/$<TARGET_FILE_NAME:${PROJECT_N
AME}>
WORKING_DIRECTORY ${CMAKE_BINARY_DIR}
)")
```

5.1.2. moc 信号槽代码生成

```
set(CMAKE_AUTOMOC ON)
```

5.1.3. uic 界面代码生成

```
set(CMAKE_AUTOUIC ON)

    file(GLOB QT "*.uic" "*.qrc")
```

5.1.4. rcc 资源代码生成

```
set(CMAKE_AUTORCC ON)
```

5.1.5. 加载qt库和头文件

```
cmake -S . -B build -
DQt5_DIR=J:/Qt/Qt5.14.2/5.14.2/msvc2017_64/lib/cmake/Qt5/

find_package(Qt5 COMPONENTS Widgets REQUIRED)

target_link_libraries(${PROJECT_NAME}
Qt5::Widgets
)
```

5.2. QT区分32位和64位程序

5.2.1. cmake -S . -B build -DQt5_DIR=J:/Qt/Qt5.14.2/5.14.2/msvc2017/lib/cmake/Qt5/ -A Win32

5.2.2. cmake -S . -B build -DQt5_DIR=J:/Qt/Qt5.14.2/5.14.2/msvc2017_64/lib/cmake/Qt5/ -A x64

5.3. QT区分Debug和Release版本

5.3.1. cmake --build build --config Debug

5.3.2. cmake --build build --config Release

5.4. 自动复制QT依赖库

5.4.1. Win32

J:\Qt\Qt5.14.2\5.14.2\msvc2017\bin\windeployqt.exe
build/Release/qt_cmake.exe

5.4.2. x64

J:\Qt\Qt5.14.2\5.14.2\msvc2017_64\bin\windeployqt.exe
build/Debug/qt_cmake.exe

5.5. cmake install QT项目和依赖动态库

5.5.1. J:\Qt\Qt5.14.2\5.14.2\msvc2017_64\bin\windeployqt.exe

5.5.2. install(TARGETS ${PROJECT_NAME}

```
    CONFIGURATIONS Debug Release
    RUNTIME DESTINATION
${CMAKE_INSTALL_PREFIX}/${CMAKE_VS_PLATFORM_NAME}/bin)


install(CODE "execute_process(COMMAND
${windeployqt}
${CMAKE_INSTALL_PREFIX}/${CMAKE_VS_PLATFORM_NAME}/bin/$<TARGET_FIL
E_NAME:${PROJECT_NAME}>
WORKING_DIRECTORY ${CMAKE_BINARY_DIR}
)")
```

5.6. cmake打包qt程序

5.6.1. J:\Qt\Qt5.14.2\5.14.2\msvc2017_64\bin\windeployqt.exe

5.6.2. 打包成zip文件

5.7. 去掉控制台 WIN32

6. ffmpeg实训课更新

6.1. 1 cmake qt环境准备

6.1.1. QT

6.1.2. VS2022

6.1.3. qt addone

旧项目升级

6.1.4. cmake

生成vs 后打开

6.1.5. 下载

https://pan.baidu.com/s/12UfEFzR9ckAJdHOW6JjYJg?pwd=1234

6.2. 2 免费部分

6.2.1. 不讲环境 将一个最简单的示例

6.3. 3 自动编译

6.3.1. 输出

6.3.2. release 和Debug

6.3.3. 去掉控制台 WIN32

6.4. 4 自动安装软件