

Colegiul Național „Alexandru Lahovari”  
Râmnicu Vâlcea

# Lucrare pentru obținerea atestatului profesional

**Profesor coordonator: Pădurețu Emil**

Elev: Dobrete Andrei–Robert  
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# Calculator

# Cuprins

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# 1 Despre proiect

Un calculator software este un calculator care a fost implementat ca un program, în loc să fie un dispozitiv hardware fizic dedicat acestui scop.

## 1.1 Opțiuni

- operațiile de bază:
  - adunare (+)
  - scădere (-)
  - înmulțire ( $\cdot$ )
  - împărțire ( $/$ )
- funcția exponențială/ridicarea la putere ( $x^y$ )
- radicalul/rădăcina pătrată a numărului ( $\sqrt{\phantom{x}}$ )
- schimbarea semnului (+/-)
- inversul numărului ( $\frac{1}{x}$ )
- procente (%)
- funcționalitate de memorie (MR/MC/M+/M-)

## 1.2 De ce am ales acest proiect?

Motivul pentru care am ales să fac un calculator pentru proiectul de atestat este deoarece calculatorul este unul din cele mai simple, des folosite, dar și indispensabile programe pe care cineva le folosește atunci când utilizează un sistem de calcul.

## 1.3 Interfață

da

## 2 Limbajul de programare C++

### 2.1 Introducere

C++ este un limbaj de programare general creat de către informaticianul Bjarne Stroustrup de la Bell Labs în anul 1985 ca o extensie a limbajului de programare C, numit inițial „C cu clase”.

Limbajul s-a maturizat destul de mult în timp, iar C++ are acum programare orientată pe obiecte și caracteristici mai avansate, precum manipulare low-level a memoriei.

Este un limbaj de programare compilat și există multe compilatoare create de diferite companii/organizații, precum Fundația Software-ului Liber (GNU GCC), LLVM (Clang), Microsoft (Visual C++), Intel (icx), Oracle (Oracle Developer Studio C++) și IBM (IBM XL C++).

C++ este standardizat de ISO<sup>1</sup>, cea mai recentă versiune a standardului fiind publicată în decembrie 2020, numită C++20.

C++ a fost dezvoltat în anii 1980, ca o serie de îmbunătățiri ale limbajului C. Acestea au început cu adăugarea noțiunii de clase, apoi de funcții virtuale, suprascrierea operatorilor, moștenire multiplă, șabloane și excepții. Limbajul a fost standardizat în anul 1998 ca și ISO 14882:1998<sup>2</sup>.

În anii 1990, C++ a devenit unul dintre cele mai populare limbaje de programare comerciale, rămânând astfel până în ziua de astăzi.

### 2.2 De ce am ales C++?

Motivele pentru care am ales să îmi scriu proiectul de atestat în limbajul C++ sunt următoarele:

- am experiență anterioară cu acesta
- este un limbaj de programare folosit în multe domenii
- chiar dacă librăria grafică în care am scris programul este valabilă și pentru alte limbaje de programare, precum Python, C# sau Rust, Qt are cel mai mult suport pentru C++

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<sup>1</sup>engleză: International Organization for Standardization (Organizația Internațională de Standardizare)

<sup>2</sup>[www.iso.org/standard/25845.html](http://www.iso.org/standard/25845.html)

## 3 Librăria Qt

### 3.1 Introducere

Qt este un framework cross-platform, creat cu scopul de a fi o librărie utilizată pentru crearea interfețelor grafice (GUI<sup>3</sup>), precum și pentru crearea de programe care rulează pe diferite platforme software ca și Linux, Windows, macOS, Android, iOS sau sisteme embedded, fără a fi necesare schimbări în cod, de cele mai multe ori, în timp ce programul scris este un program nativ platformei, cu capabilități și viteză native.

Qt este dezvoltat de Compania Qt și de Proiectul Qt, sub guvernanta open-source. Qt este valabil sub o licență comercială, dar și sub o licență open-source (GPL și LGPL)<sup>4</sup>.

Cele mai cunoscute utilizări ale Qt sunt mediul de desktop KDE Plasma pentru sistemele de operare Unix-like<sup>5</sup> (ex.: Linux/BSD), precum și programele VirtualBox, Google Earth, Autodesk Maya, Autodesk 3ds Max, DaVinci Resolve, OBS, VLC, Wireshark, qBittorrent.

### 3.2 Qt Creator

Qt Creator este un IDE<sup>6</sup> cross-platform pentru C++, JavaScript și QML care simplifică crearea programelor cu o interfață grafică. Este parte din SDK<sup>7</sup>-ul pentru framework-ul Qt pentru crearea aplicațiilor GUI. Include un debugger vizual și un designer de interfețe grafice WYSIWYG<sup>8</sup>

Editorul acestuia include caracteristici comune în alte IDE-uri, precum evidențierea sintaxei prin culori, auto-completare și mesaje despre erori în cod de la servere LSP.

Qt Creator poate folosi compilatorul GNU GCC, MinGW, Visual C++ sau Clang.

### 3.3 De ce am ales Qt?

Motivele pentru care am ales să mă folosesc de librăria Qt pentru a-mi scrie proiectul de atestat sunt următoarele:

- folosesc zilnic, de cel puțin trei ani, unul din cele mai cunoscute proiecte în care se utilizează Qt, mediul de desktop KDE Plasma și suita de programe KDE, lucru care m-a convins că este un framework robust și de încredere
- am vrut să învăț ceva nou
- am considerat că învățarea folosirii unui framework pentru crearea programelor cu interfață grafică al cărui proiecte se pot compila, mai târziu, pe aproape toate platformele software importante în ziua de astăzi este ceva care va îmi va fi util în viitor

---

<sup>3</sup>engleză: graphical user interface (interfață grafică)

<sup>4</sup>GNU General Public License și GNU Lesser General Public License: [www.gnu.org/licenses](http://www.gnu.org/licenses)

<sup>5</sup>[en.wikipedia.org/wiki/Unix-like](http://en.wikipedia.org/wiki/Unix-like)

<sup>6</sup>engleză: integrated development environment (mediu integrat de dezvoltare)

<sup>7</sup>engleză: software development kit (trusă de dezvoltare a programelor)

<sup>8</sup>engleză: what you see is what you get (ceea ce vezi este ceea ce primești)

## 4 Instrucțiuni pentru compilare

Personal, am compilat acest program doar pe Linux, așa că instrucțiunile mele vor fi puțin neclare pentru alte sisteme de operare.

Prima dată, trebuie să instalați Qt Creator:

### 4.1 Pentru Linux

Pe Linux, tot ce trebuie să faceți este să instalați Qt Creator cu ajutorul managerului de pachete al distribuției dumneavoastră, sau cu ajutorul Flatpak:

- bazate pe Debian (ex: Ubuntu, Linux Mint, Elementary OS, Pop\_OS etc.):  
`$ sudo apt install qtcreator`
- bazate pe RHEL (ex: Fedora, CentOS, Rocky Linux etc.):  
`$ sudo dnf install qt-creator`
- bazate pe Arch (ex: Manjaro, EndeavourOS, Arco Linux etc.):  
`$ sudo pacman -Syu qtcreator`
- cu Flatpak (nu contează distribuția):  
`$ sudo flatpak install io.qt.QtCreator`

### 4.2 Pentru Windows/macOS/altele

Pentru restul sistemelor de operare, sau în cazul (extrem de rar) în care nu puteți găsi pachetul pentru distribuția de Linux pe care o folosiți, puteți intra pe linkul [www.qt.io/download-qt-installer](http://www.qt.io/download-qt-installer) și să descărcați installer-ul de acolo. Dar, din încercările mele, am observat că acel instalator necesită un cont pe site-ul Qt.

După ce ați instalat Qt Creator, puteți deschide direct proiectul inclus cu CD-ul care vine cu documentația, sau să copiați codul din acest document într-un proiect nou.

## 5 Codul sursă

### 5.1 main.cpp

Acesta este fișierul care conține funcția principală a programului. Nu sunt multe modificări aici.

```
#include "calculator.h"
#include <QApplication>

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

### 5.2 calculator.h

Acesta este fișierul header, în care sunt declarate clasele, precum și funcțiile care vor urma să fie declarate.

```
#ifndef CALCULATOR_H
#define CALCULATOR_H
#include <QMainWindow>

QT_BEGIN_NAMESPACE
namespace Ui
{
    class Calculator;
}
QT_END_NAMESPACE

class Calculator : public QMainWindow
{
    Q_OBJECT

public:
    Calculator(QWidget *parent = nullptr);
    ~Calculator();

private:
    Ui::Calculator *ui;

private slots:
    void NumPressed();
    void MathButtonPressed();
}
```



```

    void EqualButtonPressed ();
    void ChSignPressed ();
    void AllClearButtonPressed ();
    void ClearButtonPressed ();
    void MemButtonPressed ();
    void MemResultButtonPressed ();
    void MemClearButtonPressed ();
    void SqrtButtonPressed ();
    void InvButtonPressed ();
    void PercButtonPressed ();
    void PeriodButtonPressed ();
};
#endif // CALCULATOR_H

```

### 5.3 calculator.cpp

Acesta este fișierul cel mai important din proiect. Este fișierul care declară funcțiile necesare, creează variabilele și spune programului ce funcții trebuie folosite la apăsarea căror butoane.

```

#include "calculator.h"
#include "../ui_calculator.h"

```

```

double calcVal      = 0.0 ,
       mrVal        = 0.0;
bool  divTrigger    = false ,
       multTrigger   = false ,
       addTrigger    = false ,
       subTrigger    = false ,
       powTrigger    = false ,
       mrTrigger     = false ,
       mpTrigger     = false ,
       mmTrigger     = false ;

```

```

Calculator::Calculator(QWidget *parent):
    QMainWindow(parent),
    ui(new Ui::Calculator)
{
    ui->setupUi(this);

    ui->Display->setText(QString::number(calcVal));
    QPushButton *numButtons[10];

    // Ce functie se executa atunci cand se apasa ce buton
    // pentru cifre
    for(int i=0; i<10; ++i)
    {
        QString butName = "Button" + QString::number(i);

```

```

        numButtons[i] = Calculator::findChild<QPushButton *>(butName);
        connect(numButtons[i], SIGNAL(released()), this, SLOT(NumPressed))
    }

    // pentru operatiile de baza
    connect(ui->ButtonPlus, SIGNAL(released()), this, SLOT(MathButtonPre
    connect(ui->ButtonMinus, SIGNAL(released()), this, SLOT(MathButtonPre
    connect(ui->ButtonMultiply, SIGNAL(released()), this, SLOT(MathButto
    connect(ui->ButtonDivide, SIGNAL(released()), this, SLOT(MathButtonF

    // pentru operatiile in plus
    connect(ui->ButtonPow, SIGNAL(released()), this, SLOT(MathButtonPres
    connect(ui->ButtonSqrt, SIGNAL(released()), this, SLOT(SqrtButtonPre
    connect(ui->ButtonInverse, SIGNAL(released()), this, SLOT(InvButtonP
    connect(ui->ButtonPercent, SIGNAL(released()), this, SLOT(PercButton

    // pentru alte butoane
    connect(ui->ButtonEquals, SIGNAL(released()), this, SLOT(EqualButton
    connect(ui->ButtonChSign, SIGNAL(released()), this, SLOT(ChSignPresse
    connect(ui->ButtonAllClear, SIGNAL(released()), this, SLOT(AllClearB
    connect(ui->ButtonClear, SIGNAL(released()), this, SLOT(ClearButtonP
    connect(ui->ButtonPeriod, SIGNAL(released()), this, SLOT(PeriodButton

    // pentru butoanele de memorie
    connect(ui->ButtonMemResult, SIGNAL(released()), this, SLOT(MemResu
    connect(ui->ButtonMemClear, SIGNAL(released()), this, SLOT(MemClearE
    connect(ui->ButtonMemPlus, SIGNAL(released()), this, SLOT(MemButtonF
    connect(ui->ButtonMemMinus, SIGNAL(released()), this, SLOT(MemButtonF
}

Calculator::~Calculator()
{
    delete ui;
}

// Actiunea pentru apasarea cifrelor
void Calculator::NumPressed()
{
    QPushButton *button = (QPushButton *)sender();
    QString butVal = button->text();
    QString displayVal = ui->Display->text();

    if((displayVal.toDouble() == 0) || (displayVal.toDouble() == 0.0))
        ui->Display->setText(butVal);
    else
    {
        QString newVal = displayVal + butVal;

```

```

        double dblNewVal = newVal.toDouble();
        ui->Display->setText(QString::number(dblNewVal, 'g', 16)); //scr
    }
}

// Actiunea pentru detectarea apasarii semnelor
void Calculator::MathButtonPressed()
{
    //reseteaza valorile semnelor
    addTrigger = false;
    subTrigger = false;
    multTrigger = false;
    divTrigger = false;
    powTrigger = false;

    QString displayVal = ui->Display->text();
    calcVal = displayVal.toDouble();

    QPushButton *button = (QPushButton *)sender();
    QString butVal = button->text();

    if(QString::compare(butVal, "+", Qt::CaseInsensitive) == 0)
        addTrigger = true;
    else if(QString::compare(butVal, "-", Qt::CaseInsensitive) == 0)
        subTrigger = true;
    else if(QString::compare(butVal, "*", Qt::CaseInsensitive) == 0)
        multTrigger = true;
    else if(QString::compare(butVal, "/", Qt::CaseInsensitive) == 0)
        divTrigger = true;
    else if(QString::compare(butVal, "^", Qt::CaseInsensitive) == 0)
        powTrigger = true;

    ui->Display->setText(""); //sterge ecran dupa apasarea semnului
}

// Actiunea pentru apasarea egalului
void Calculator::EqualButtonPressed()
{
    double solution = 0.0;
    QString displayVal = ui->Display->text();
    double dblDisplayVal = displayVal.toDouble();

    //calcularea solutiei
    if(addTrigger || subTrigger || multTrigger || divTrigger || powTrigg
    {
        if(addTrigger) solution = calcVal + dblDisplayVal;
        else if(subTrigger) solution = calcVal - dblDisplayVal;
    }

```

```

        else if(multTrigger) solution = calcVal * dblDisplayVal;
        else if(divTrigger)  solution = calcVal / dblDisplayVal;
        else if(powTrigger)  solution = qPow(calcVal, dblDisplayVal);
    }
    ui->Display->setText( QString::number(solution)); //afisare rezultat
}

// Actiunea pentru schimbarea semnului
void Calculator::ChSignPressed()
{
    QString displayVal = ui->Display->text();
    double dblDisplayVal = displayVal.toDouble();
    double dblDisplayValSign = -1 * dblDisplayVal;
    ui->Display->setText( QString::number(dblDisplayValSign)); //arata sch
}

// Actiunea pentru apasarea de clear
void Calculator::AllClearButtonPressed()
{
    ui->Display->setText( QString::number(0.0));
}

// Actiunea pentru apasarea butoanelor de memorie
void Calculator::MemButtonPressed()
{
    //reseteaza valorile butoanelor
    mpTrigger = false;
    mmTrigger = false;

    //      mrVal = 0.0;

    QString displayVal = ui->Display->text();
    double dblDisplayVal = displayVal.toDouble();

    QPushButton *button = (QPushButton *)sender();
    QString butVal = button->text();

    if(QString::compare(butVal, "M+", Qt::CaseInsensitive) == 0)
        mpTrigger = true;
    else if(QString::compare(butVal, "M-", Qt::CaseInsensitive) == 0)
        mmTrigger = true;

    if(mpTrigger || mmTrigger)
    {
        if(mpTrigger) mrVal = mrVal + dblDisplayVal;
        else if(mmTrigger) mrVal = mrVal - dblDisplayVal;
    }
}

```

```

}

// Actiunea pentru apasarea rezultatului de memorie
void Calculator::MemResultButtonPressed()
{
    ui->Display->setText( QString::number( mrVal ) ); //afisare rezultat
    mrVal = 0.0;
}

// Actiunea pentru apasarea clear-ului de memorie
void Calculator::MemClearButtonPressed()
{
    mrVal = 0.0;
}

// Actiune pentru apasarea radicalului
void Calculator::SqrtButtonPressed()
{
    QString displayVal = ui->Display->text();
    double dblDisplayVal = displayVal.toDouble();
    double dblDisplayValSqrt = qSqrt( dblDisplayVal );
    ui->Display->setText( QString::number( dblDisplayValSqrt ) );
}

// Actiune pentru apasarea inversului
void Calculator::InvButtonPressed()
{
    QString displayVal = ui->Display->text();
    double dblDisplayVal = displayVal.toDouble();
    double dblDisplayValInv = 1 / dblDisplayVal;
    ui->Display->setText( QString::number( dblDisplayValInv ) );
}

// Actiune pentru apasarea procentului
void Calculator::PercButtonPressed()
{
    QString displayVal = ui->Display->text();
    double dblDisplayVal = displayVal.toDouble();
    double dblDisplayValPerc = dblDisplayVal / 100;
    ui->Display->setText( QString::number( dblDisplayValPerc ) );
}

// Actiune pentru apasarea virgulei
void Calculator::PeriodButtonPressed()
{
    QString displayVal = ui->Display->text();

```

```

        displayVal = displayVal + ".";
        ui->Display->setText ( displayVal );
    }

// Actiune pentru apasarea backspace
void Calculator::ClearButtonPressed()
{
    QString displayVal = ui->Display->text();
    if (! displayVal.isEmpty())
        displayVal.chop(1);
    else displayVal = "0";
    ui->Display->setText ( displayVal );
}

```

## 5.4 calculator.ui

Acesta este fișierul care conține layout-ul grafic al programului (ex.: unde se află butoanele, felul în care arată etc.). Acesta a fost auto-generat de către componenta de ‘Design’ din interiorul IDE-ului Qt Creator (secțiunea 3.2). Este, de asemenea, și cel mai lung fișier din întregul proiect.

```

<?xml version="1.0" encoding="UTF-8"?>
<ui version="4.0">
    <class>Calculator</class>
    <widget class="QMainWindow" name="Calculator">
        <property name="geometry">
            <rect>
                <x>0</x>
                <y>0</y>
                <width>242</width>
                <height>388</height>
            </rect>
        </property>
        <property name="minimumSize">
            <size>
                <width>242</width>
                <height>388</height>
            </size>
        </property>
        <property name="windowTitle">
            <string>Calculator</string>
        </property>
        <property name="styleSheet">
            <string notr="true">QMainWindow
{
    background-color: #333333;
}</string>
        </property>
    </widget>

```

```

<widget class="QWidget" name="centralwidget">
<layout class="QGridLayout" name="gridLayout">
<item row="5" column="1">
<widget class="QPushButton" name="Button7">
<property name="sizePolicy">
<sizepolicy hstretch="Maximum" vstretch="Maximum">
<horstretch>0</horstretch>
<verstretch>0</verstretch>
</sizepolicy>
</property>
<property name="minimumSize">
<size>
<width>40</width>
<height>40</height>
</size>
</property>
<property name="maximumSize">
<size>
<width>999999</width>
<height>999999</height>
</size>
</property>
<property name="font">
<font>
<family>Iosevka Term</family>
<pointsize>12</pointsize>
</font>
</property>
<property name="styleSheet">
<string notr="true">QPushButton
{
    color: #FFFFFF;
    background-color: #COCOCO;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
    color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
</property>
<property name="text">
<string>7</string>
</property>

```

```

    </widget>
</item>
<item row="5" column="4">
  <widget class="QPushButton" name="ButtonPow">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vstretch="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>
    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
  color: #FFFFFF;
  background-color: #00cc00;
  border: 1px solid gray;
  padding: 5px;
}
QPushButton:pressed
{
  color: #FFFFFF;
  background-color: #A9A9A9;
  border: 1px solid gray;
  padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>^</string>
    </property>

```



```

    </widget>
</item>
<item row="5" column="2">
  <widget class="QPushButton" name="Button8">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vstretch="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>
    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
    color: #FFFFFF;
    background-color: #COCOCO;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
    color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>8</string>
    </property>

```

```

    </widget>
</item>
<item row="3" column="4">
  <widget class="QPushButton" name="ButtonInverse">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vstretch="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>
    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="stylesheet">
      <string notr="true">QPushButton
{
  color: #FFFFFF;
  background-color: #800080;
  border: 1px solid gray;
  padding: 5px;
}
QPushButton:pressed
{
  color: #FFFFFF;
  background-color: #A9A9A9;
  border: 1px solid gray;
  padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>1/x</string>
    </property>

```

```

    </widget>
</item>
<item row="8" column="1">
  <widget class="QPushButton" name="Button0">
    <property name="sizePolicy">
      <sizepolicy hsize="Maximum" vsize="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>
    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
    color: #FFFFFF;
    background-color: #COCOCO;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
    color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>0</string>
    </property>

```

```

    </widget>
</item>
<item row="7" column="1">
  <widget class="QPushButton" name="Button1">
    <property name="sizePolicy">
      <sizepolicy hsietype="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>
    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
    color: #FFFFFF;
    background-color: #COCOCO;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
    color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>1</string>
    </property>

```

```

    </widget>
</item>
<item row="7" column="5">
  <widget class="QPushButton" name="ButtonMinus">
    <property name="sizePolicy">
      <sizepolicy hsietype="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>
    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
    color: #FFFFFF;
    background-color: #e69500;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
    color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>—</string>
    </property>

```

```

    </widget>
</item>
<item row="7" column="2">
  <widget class="QPushButton" name="Button2">
    <property name="sizePolicy">
      <sizepolicy hsiptype="Maximum" vsiptye="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>
    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
    color: #FFFFFF;
    background-color: #COCOCO;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
    color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>2</string>
    </property>

```

```

    </widget>
</item>
<item row="6" column="2">
  <widget class="QPushButton" name="Button5">
    <property name="sizePolicy">
      <sizepolicy hsizeType="Maximum" vsizeType="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>
    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
    color: #FFFFFF;
    background-color: #COCOCO;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
    color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>5</string>
    </property>

```

```

    </widget>
</item>
<item row="0" column="1" colspan="5">
    <widget class="QLineEdit" name="Display">
        <property name="sizePolicy">
            <sizepolicy hsize="Preferred" vsize="Expanding">
                <horstretch>0</horstretch>
                <verstretch>0</verstretch>
            </sizepolicy>
        </property>
        <property name="minimumSize">
            <size>
                <width>0</width>
                <height>50</height>
            </size>
        </property>
        <property name="font">
            <font>
                <family>Iosevka Term</family>
                <pointsize>18</pointsize>
                <bold>true</bold>
            </font>
        </property>
        <property name="styleSheet">
            <string notr="true">QLineEdit
{
    background-color: gray;
    border: 1px solid gray;
    color: #ffffff;
} </string>
        </property>
        <property name="text">
            <string>0.0</string>
        </property>
        <property name="alignment">
            <set>Qt::AlignRight|Qt::AlignTrailing|Qt::AlignVCenter</set>
        </property>
    </widget>
</item>
<item row="3" column="5">
    <widget class="QPushButton" name="ButtonPercent">
        <property name="sizePolicy">
            <sizepolicy hsize="Maximum" vsize="Maximum">
                <horstretch>0</horstretch>
                <verstretch>0</verstretch>
            </sizepolicy>
        </property>

```



```

    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
  color: #FFFFFF;
    background-color: #9400D3;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
  color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>%</string>
    </property>
  </widget>
</item>
<item row="6" column="5">
  <widget class="QPushButton" name="ButtonDivide">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>

```

```

    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
  color: #FFFFFF;
    background-color: #ffafla;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
  color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string></string>
    </property>
  </widget>
</item>
<item row="8" column="3">
  <widget class="QPushButton" name="ButtonChSign">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>

```

```

    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
    color: #FFFFFF;
    background-color: qlineargradient(spread:pad, x1:0, y1:0, x2:1, y2:1);
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
    color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>+/-</string>
    </property>
  </widget>
</item>
<item row="5" column="3">
  <widget class="QPushButton" name="Button9">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>

```

```

    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
    color: #FFFFFF;
    background-color: #COCOCO;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
    color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>9</string>
    </property>
  </widget>
</item>
<item row="2" column="5">
  <widget class="QPushButton" name="ButtonAllClear">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>

```

```

    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
    color: #FFFFFF;
    background-color: #FF0000;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
    color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>AC</string>
    </property>
  </widget>
</item>
<item row="2" column="2">
  <widget class="QPushButton" name="ButtonMemPlus">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>

```

```

    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
  color: #FFFFFF;
  background-color: #00CED1;
  border: 1px solid gray;
  padding: 5px;
}
QPushButton:pressed
{
  color: #FFFFFF;
  background-color: #A9A9A9;
  border: 1px solid gray;
  padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>M</string>
    </property>
  </widget>
</item>
<item row="6" column="4">
  <widget class="QPushButton" name="ButtonMultiply">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>

```

```

    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
  color: #FFFFFF;
    background-color: #00b300;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
  color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>*</string>
    </property>
  </widget>
</item>
<item row="5" column="5">
  <widget class="QPushButton" name="ButtonSqrt">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>

```

```

    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>11</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
    color: #FFFFFF;
    background-color: #ffb833;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
    color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string√></string>
    </property>
  </widget>
</item>
<item row="6" column="1">
  <widget class="QPushButton" name="Button4">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>

```



```

    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
    color: #FFFFFF;
    background-color: #COCOCO;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
    color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>4</string>
    </property>
  </widget>
</item>
<item row="7" column="4">
  <widget class="QPushButton" name="ButtonPlus">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>

```

```

    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
  color: #FFFFFF;
    background-color: #008000;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
  color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>+</string>
    </property>
  </widget>
</item>
<item row="2" column="1">
  <widget class="QPushButton" name="ButtonMemResult">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>

```

```

    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
    color: #FFFFFF;
    background-color: #008080;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
    color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>MR</string>
    </property>
  </widget>
</item>
<item row="6" column="3">
  <widget class="QPushButton" name="Button6">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>

```

```

    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
    color: #FFFFFF;
    background-color: #COCOCO;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
    color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>6</string>
    </property>
  </widget>
</item>
<item row="7" column="3">
  <widget class="QPushButton" name="Button3">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>

```

```

    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
    color: #FFFFFF;
    background-color: #COCOCO;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
    color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>3</string>
    </property>
  </widget>
</item>
<item row="3" column="1">
  <widget class="QPushButton" name="ButtonMemClear">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>

```

```

    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
  color: #FFFFFF;
    background-color: #004040;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
  color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>MC</string>
    </property>
  </widget>
</item>
<item row="3" column="2">
  <widget class="QPushButton" name="ButtonMemMinus">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>

```

```

    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
  color: #FFFFFF;
  background-color: #20B2AA;
  border: 1px solid gray;
  padding: 5px;
}
QPushButton:pressed
{
  color: #FFFFFF;
  background-color: #A9A9A9;
  border: 1px solid gray;
  padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>M</string>
    </property>
  </widget>
</item>
<item row="8" column="2">
  <widget class="QPushButton" name="ButtonPeriod">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>

```

```

    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
    color: #FFFFFF;
    background-color: #COCOCO;
    border: 1px solid gray;
    padding: 5px;
}
QPushButton:pressed
{
    color: #FFFFFF;
    background-color: #A9A9A9;
    border: 1px solid gray;
    padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>.</string>
    </property>
  </widget>
</item>
<item row="8" column="4" colspan="2">
  <widget class="QPushButton" name="ButtonEquals">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>

```



```

    <property name="minimumSize">
      <size>
        <width>40</width>
        <height>40</height>
      </size>
    </property>
    <property name="maximumSize">
      <size>
        <width>999999</width>
        <height>999999</height>
      </size>
    </property>
    <property name="font">
      <font>
        <family>Iosevka Term</family>
        <pointsize>12</pointsize>
      </font>
    </property>
    <property name="styleSheet">
      <string notr="true">QPushButton
{
  color: #FFFFFF;
  background-color: #1E90FF;
  border: 1px solid gray;
  padding: 5px;
}
QPushButton:pressed
{
  background-color: #A9A9A9;
  border: 1px solid gray;
  padding: 5px;
}</string>
    </property>
    <property name="text">
      <string>=</string>
    </property>
  </widget>
</item>
<item row="2" column="4">
  <widget class="QPushButton" name="ButtonClear">
    <property name="sizePolicy">
      <sizepolicy hstretch="Maximum" vsizetype="Maximum">
        <horstretch>0</horstretch>
        <verstretch>0</verstretch>
      </sizepolicy>
    </property>
    <property name="minimumSize">

```

```

    <size>
      <width>40</width>
      <height>40</height>
    </size>
  </property>
  <property name="maximumSize">
    <size>
      <width>999999</width>
      <height>999999</height>
    </size>
  </property>
  <property name="font">
    <font>
      <family>Iosevka Term</family>
      <pointsize>12</pointsize>
    </font>
  </property>
  <property name="styleSheet">
    <string notr="true">QPushButton
{
  color: #FFFFFF;
  background-color: #cccc00;
  border: 1px solid gray;
  padding: 5px;
}
QPushButton:pressed
{
  color: #FFFFFF;
  background-color: #A9A9A9;
  border: 1px solid gray;
  padding: 5px;
}</string>
  </property>
  <property name="text">
    <string>C</string>
  </property>
</widget>
</item>
</layout>
</widget>
<widget class="QMenuBar" name="menubar">
  <property name="geometry">
    <rect>
      <x>0</x>
      <y>0</y>
      <width>242</width>
      <height>22</height>

```

```
        </rect>
    </property>
</widget>
<widget class="QStatusBar" name="statusbar"/>
</widget>
<resources/>
<connections/>
</ui>
]
```

## 6 Programe utilizate

### 6.1 Pentru scrierea codului

- Qt Creator (secțiunea 3.2) ([www.qt.io/download-qt-installer](http://www.qt.io/download-qt-installer)) – scrierea codului + design GUI
- Neovim ([neovim.io](http://neovim.io)) cu multe plugin-uri și configurări ([gitlab.com/Andy3153/andy3153-init\\_vim](https://gitlab.com/Andy3153/andy3153-init_vim)) – scrierea codului
- GNU GCC ([gcc.gnu.org](http://gcc.gnu.org)) – compilatorul utilizat

### 6.2 Pentru scrierea documentației

- Neovim ([neovim.io](http://neovim.io)) cu multe plugin-uri și configurări ([gitlab.com/Andy3153/andy3153-init\\_vim](https://gitlab.com/Andy3153/andy3153-init_vim)) – scrierea documentației
- VimTeX ([github.com/lervag/vimtex](https://github.com/lervag/vimtex)) – plugin pentru Vim/Neovim pentru scrierea documentelor  $\text{\TeX}$
- $\text{\LaTeX}$ mk – pentru compilarea mai ușoară a documentelor  $\text{\TeX}$
- $\text{\TeX}$  Live – distribuția de  $\text{\LaTeX}$
- $\text{\XeLaTeX}$  – engine-ul de  $\text{\TeX}$  folosit de mine

## 7 Bibliografie

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- qt.io: documentație: [doc.qt.io/all-topics.html](https://doc.qt.io/all-topics.html)
- Wikipedia: Qt (engleză): [en.wikipedia.org/wiki/Qt\\_\(software\)](https://en.wikipedia.org/wiki/Qt_(software))
- Wikipedia: Qt (română): [ro.wikipedia.org/wiki/Qt](https://ro.wikipedia.org/wiki/Qt)
- Wikipedia: Qt Creator: [en.wikipedia.org/wiki/Qt\\_Creator](https://en.wikipedia.org/wiki/Qt_Creator)