Министерство образования и науки Российской Федерации

Федеральное государственное бюджетное образовательное учреждение высшего образования

**«Пермский национальный исследовательский политехнический университет»**

Кафедра **«**Информационные технологии и автоматизированные системы**»**

**ОТЧЕТ**

**ПО ТВОРЧЕСКОЙ РАБОТЕ №1**

Дисциплина: «Основы алгоритмизации и программирования»

Семестр 2

Тема: АРМ кассира

Выполнил работу

Студент группы РИС-22-1Б

Головин М.А.

Проверил

Доцент кафедры ИТАС

Полякова О.А.

г. Пермь-2023

**Введение**

Для выполнения лабораторной работы требуется сделать отчет программы. Создание программ – отличный способ практики программирования.

**Постановка задачи**

Реализация приложения на основе Windows Forms, облегчающее работу кассира.

**Код программы**

**AuthWindow.h**

#pragma once

#include "MainWindow.h"

namespace ARMR {

using namespace System;

using namespace System::ComponentModel;

using namespace System::Collections;

using namespace System::Windows::Forms;

using namespace System::Data;

using namespace System::Drawing;

/// <summary>

/// Сводка для MyForm1

/// </summary>

public ref class AuthWindow : public System::Windows::Forms::Form

{

public:

AuthWindow(void)

{

InitializeComponent();

//

//TODO: добавьте код конструктора

//

}

private: System::Windows::Forms::Button^ ExitButton;

private: System::Windows::Forms::Button^ ButtonHide;

public:

public:

public:

protected:

/// <summary>

/// Освободить все используемые ресурсы.

/// </summary>

~AuthWindow()

{

if (components)

{

delete components;

}

}

private: System::Windows::Forms::DateTimePicker^ DateTime;

protected:

private: System::Windows::Forms::TextBox^ LoginTab;

private: System::Windows::Forms::TextBox^ PasswordTab;

private: System::Windows::Forms::Label^ MainLabel;

private: System::Windows::Forms::Button^ AcceptButton;

protected:

private:

/// <summary>

/// Обязательная переменная конструктора.

/// </summary>

System::ComponentModel::Container ^components;

#pragma region Windows Form Designer generated code

/// <summary>

/// Требуемый метод для поддержки конструктора — не изменяйте

/// содержимое этого метода с помощью редактора кода.

/// </summary>

void InitializeComponent(void)

{

this->DateTime = (gcnew System::Windows::Forms::DateTimePicker());

this->LoginTab = (gcnew System::Windows::Forms::TextBox());

this->PasswordTab = (gcnew System::Windows::Forms::TextBox());

this->MainLabel = (gcnew System::Windows::Forms::Label());

this->AcceptButton = (gcnew System::Windows::Forms::Button());

this->ExitButton = (gcnew System::Windows::Forms::Button());

this->ButtonHide = (gcnew System::Windows::Forms::Button());

this->SuspendLayout();

//

// DateTime

//

this->DateTime->Cursor = System::Windows::Forms::Cursors::Hand;

this->DateTime->Location = System::Drawing::Point(17, 88);

this->DateTime->Name = L"DateTime";

this->DateTime->Size = System::Drawing::Size(270, 22);

this->DateTime->TabIndex = 0;

//

// LoginTab

//

this->LoginTab->Cursor = System::Windows::Forms::Cursors::IBeam;

this->LoginTab->Location = System::Drawing::Point(17, 32);

this->LoginTab->MaxLength = 5;

this->LoginTab->Name = L"LoginTab";

this->LoginTab->Size = System::Drawing::Size(270, 22);

this->LoginTab->TabIndex = 1;

//

// PasswordTab

//

this->PasswordTab->Cursor = System::Windows::Forms::Cursors::IBeam;

this->PasswordTab->Location = System::Drawing::Point(17, 60);

this->PasswordTab->MaxLength = 5;

this->PasswordTab->Name = L"PasswordTab";

this->PasswordTab->PasswordChar = '#';

this->PasswordTab->Size = System::Drawing::Size(270, 22);

this->PasswordTab->TabIndex = 2;

//

// MainLabel

//

this->MainLabel->AutoSize = true;

this->MainLabel->BackColor = System::Drawing::SystemColors::ActiveBorder;

this->MainLabel->Cursor = System::Windows::Forms::Cursors::Default;

this->MainLabel->ForeColor = System::Drawing::SystemColors::ActiveCaptionText;

this->MainLabel->Location = System::Drawing::Point(10, 10);

this->MainLabel->Name = L"MainLabel";

this->MainLabel->Size = System::Drawing::Size(202, 16);

this->MainLabel->TabIndex = 3;

this->MainLabel->Text = L"Введите логин, пароль и дату";

//

// AcceptButton

//

this->AcceptButton->Cursor = System::Windows::Forms::Cursors::Hand;

this->AcceptButton->Location = System::Drawing::Point(17, 116);

this->AcceptButton->Name = L"AcceptButton";

this->AcceptButton->Size = System::Drawing::Size(270, 26);

this->AcceptButton->TabIndex = 4;

this->AcceptButton->Text = L"Начать работу";

this->AcceptButton->UseVisualStyleBackColor = true;

this->AcceptButton->Click += gcnew System::EventHandler(this, &AuthWindow::AcceptButton\_Click);

//

// ExitButton

//

this->ExitButton->Font = (gcnew System::Drawing::Font(L"Microsoft Sans Serif", 6, System::Drawing::FontStyle::Regular, System::Drawing::GraphicsUnit::Point,

static\_cast<System::Byte>(0)));

this->ExitButton->Location = System::Drawing::Point(280, 5);

this->ExitButton->Name = L"ExitButton";

this->ExitButton->Size = System::Drawing::Size(20, 20);

this->ExitButton->TabIndex = 5;

this->ExitButton->Text = L"X";

this->ExitButton->UseVisualStyleBackColor = true;

this->ExitButton->Click += gcnew System::EventHandler(this, &AuthWindow::ExitButton\_Click);

//

// ButtonHide

//

this->ButtonHide->Font = (gcnew System::Drawing::Font(L"Microsoft Sans Serif", 5, System::Drawing::FontStyle::Bold, System::Drawing::GraphicsUnit::Point,

static\_cast<System::Byte>(0)));

this->ButtonHide->Location = System::Drawing::Point(254, 5);

this->ButtonHide->Name = L"ButtonHide";

this->ButtonHide->Size = System::Drawing::Size(20, 20);

this->ButtonHide->TabIndex = 6;

this->ButtonHide->Text = L"-";

this->ButtonHide->UseVisualStyleBackColor = true;

this->ButtonHide->Click += gcnew System::EventHandler(this, &AuthWindow::ButtonHide\_Click);

//

// AuthWindow

//

this->AutoScaleDimensions = System::Drawing::SizeF(8, 16);

this->AutoScaleMode = System::Windows::Forms::AutoScaleMode::Font;

this->BackColor = System::Drawing::SystemColors::ActiveCaption;

this->ClientSize = System::Drawing::Size(305, 150);

this->Controls->Add(this->ButtonHide);

this->Controls->Add(this->ExitButton);

this->Controls->Add(this->AcceptButton);

this->Controls->Add(this->MainLabel);

this->Controls->Add(this->PasswordTab);

this->Controls->Add(this->LoginTab);

this->Controls->Add(this->DateTime);

this->FormBorderStyle = System::Windows::Forms::FormBorderStyle::None;

this->Name = L"AuthWindow";

this->StartPosition = System::Windows::Forms::FormStartPosition::CenterScreen;

this->Text = L"Авторизация";

this->ResumeLayout(false);

this->PerformLayout();

}

#pragma endregion

private: System::Void AcceptButton\_Click(System::Object^ sender, System::EventArgs^ e) {

if ((this->LoginTab->Text == "admin") && (this->PasswordTab->Text == "admin")) {

String^ Date = this->DateTime->Value.ToString();

MainWindow^ MainF = gcnew MainWindow(Date);

MainF->Visible = true;

MainF->Activate();

this->Visible = false;

}

else {

this->MainLabel->Text = "Неправильный пароль и/или логин";

//this->MainLabel->Text = this->DateTime->Value.ToString();

}

}

private: System::Void ExitButton\_Click(System::Object^ sender, System::EventArgs^ e) {

Application::Exit();

}

private: System::Void ButtonHide\_Click(System::Object^ sender, System::EventArgs^ e) {

this->WindowState = System::Windows::Forms::FormWindowState::Minimized;

}

};

}

**AuthWindow.cpp**

#include "AuthWindow.h"

#include "Windows.h"

using namespace ARMR;

int WINAPI WinMain(HINSTANCE, HINSTANCE, LPSTR, int)

{

Application::EnableVisualStyles();

Application::SetCompatibleTextRenderingDefault(false);

Application::Run(gcnew AuthWindow);

return 0;

}

**MainWindow.h**

#pragma once

#include <windows.h>

#include <fstream>

#include <string>

#include <vector>

#include "msclr\marshal\_cppstd.h"

#include "Food.h"

namespace ARMR {

using namespace System;

using namespace System::ComponentModel;

using namespace System::Collections;

using namespace System::Windows::Forms;

using namespace System::Data;

using namespace System::Drawing;

using namespace std;

/// <summary>

/// Сводка для MyForm

/// </summary>

public ref class MainWindow : public System::Windows::Forms::Form

{

protected:

float FinalPrice;

vector<Food>\* List;

System::String^ DateData;

bool Package;

private: System::Windows::Forms::Button^ SaveButton;

public:

MainWindow(String^ Date)

{

InitializeComponent();

List = new vector<Food>;

this->DateData = Date;

FinalPrice = 0;

Package = false;

}

protected:

/// <summary>

/// Освободить все используемые ресурсы.

/// </summary>

~MainWindow()

{

if (components)

{

delete components;

}

delete List;

}

private: System::Windows::Forms::Button^ ButtonAdd;

protected:

private: System::Windows::Forms::ListBox^ ProductList;

private: System::Windows::Forms::Button^ ExitButton;

private: System::Windows::Forms::Label^ ProjectLabel;

private: System::Windows::Forms::Button^ ButtonHide;

private: System::Windows::Forms::Button^ DeleteButton;

private: System::Windows::Forms::CheckBox^ PackageCheck;

private: System::Windows::Forms::ListBox^ PriceBox;

private: System::Windows::Forms::Label^ label1;

private: System::Windows::Forms::Label^ PriceTotal;

protected:

private:

/// <summary>

/// Обязательная переменная конструктора.

/// </summary>

System::ComponentModel::Container^ components;

#pragma region Windows Form Designer generated code

/// <summary>

/// Требуемый метод для поддержки конструктора — не изменяйте

/// содержимое этого метода с помощью редактора кода.

/// </summary>

void InitializeComponent(void)

{

this->ButtonAdd = (gcnew System::Windows::Forms::Button());

this->ProductList = (gcnew System::Windows::Forms::ListBox());

this->ExitButton = (gcnew System::Windows::Forms::Button());

this->ProjectLabel = (gcnew System::Windows::Forms::Label());

this->ButtonHide = (gcnew System::Windows::Forms::Button());

this->DeleteButton = (gcnew System::Windows::Forms::Button());

this->PackageCheck = (gcnew System::Windows::Forms::CheckBox());

this->PriceBox = (gcnew System::Windows::Forms::ListBox());

this->label1 = (gcnew System::Windows::Forms::Label());

this->PriceTotal = (gcnew System::Windows::Forms::Label());

this->SaveButton = (gcnew System::Windows::Forms::Button());

this->SuspendLayout();

//

// ButtonAdd

//

this->ButtonAdd->BackColor = System::Drawing::SystemColors::ButtonHighlight;

this->ButtonAdd->Cursor = System::Windows::Forms::Cursors::Hand;

this->ButtonAdd->FlatStyle = System::Windows::Forms::FlatStyle::Popup;

this->ButtonAdd->Location = System::Drawing::Point(10, 550);

this->ButtonAdd->Name = L"ButtonAdd";

this->ButtonAdd->Size = System::Drawing::Size(110, 75);

this->ButtonAdd->TabIndex = 0;

this->ButtonAdd->Text = L"Добавить случайный товар в список";

this->ButtonAdd->UseVisualStyleBackColor = false;

this->ButtonAdd->Click += gcnew System::EventHandler(this, &MainWindow::button1\_Click);

//

// ProductList

//

this->ProductList->BackColor = System::Drawing::SystemColors::Menu;

this->ProductList->BorderStyle = System::Windows::Forms::BorderStyle::None;

this->ProductList->Cursor = System::Windows::Forms::Cursors::Default;

this->ProductList->ForeColor = System::Drawing::SystemColors::ActiveCaptionText;

this->ProductList->FormattingEnabled = true;

this->ProductList->ItemHeight = 16;

this->ProductList->Location = System::Drawing::Point(130, 30);

this->ProductList->Name = L"ProductList";

this->ProductList->Size = System::Drawing::Size(200, 448);

this->ProductList->TabIndex = 1;

//

// ExitButton

//

this->ExitButton->Font = (gcnew System::Drawing::Font(L"Microsoft Sans Serif", 6, System::Drawing::FontStyle::Regular, System::Drawing::GraphicsUnit::Point,

static\_cast<System::Byte>(0)));

this->ExitButton->Location = System::Drawing::Point(525, 5);

this->ExitButton->Name = L"ExitButton";

this->ExitButton->Size = System::Drawing::Size(20, 20);

this->ExitButton->TabIndex = 2;

this->ExitButton->Text = L"X";

this->ExitButton->UseVisualStyleBackColor = true;

this->ExitButton->Click += gcnew System::EventHandler(this, &MainWindow::ExitButton\_Click);

//

// ProjectLabel

//

this->ProjectLabel->AutoSize = true;

this->ProjectLabel->BackColor = System::Drawing::SystemColors::InactiveCaption;

this->ProjectLabel->Font = (gcnew System::Drawing::Font(L"Microsoft Sans Serif", 8, System::Drawing::FontStyle::Regular, System::Drawing::GraphicsUnit::Point,

static\_cast<System::Byte>(0)));

this->ProjectLabel->ForeColor = System::Drawing::SystemColors::ActiveCaptionText;

this->ProjectLabel->Location = System::Drawing::Point(5, 5);

this->ProjectLabel->Name = L"ProjectLabel";

this->ProjectLabel->Size = System::Drawing::Size(399, 17);

this->ProjectLabel->TabIndex = 3;

this->ProjectLabel->Text = L"Автоматизированное рабочее место специалиста-кассира";

//

// ButtonHide

//

this->ButtonHide->Font = (gcnew System::Drawing::Font(L"Microsoft Sans Serif", 5, System::Drawing::FontStyle::Bold, System::Drawing::GraphicsUnit::Point,

static\_cast<System::Byte>(0)));

this->ButtonHide->Location = System::Drawing::Point(500, 5);

this->ButtonHide->Name = L"ButtonHide";

this->ButtonHide->Size = System::Drawing::Size(20, 20);

this->ButtonHide->TabIndex = 4;

this->ButtonHide->Text = L"-";

this->ButtonHide->UseVisualStyleBackColor = true;

this->ButtonHide->Click += gcnew System::EventHandler(this, &MainWindow::ButtonHide\_Click);

//

// DeleteButton

//

this->DeleteButton->BackColor = System::Drawing::Color::IndianRed;

this->DeleteButton->Cursor = System::Windows::Forms::Cursors::Hand;

this->DeleteButton->FlatAppearance->BorderColor = System::Drawing::Color::White;

this->DeleteButton->FlatStyle = System::Windows::Forms::FlatStyle::Popup;

this->DeleteButton->Font = (gcnew System::Drawing::Font(L"Microsoft Sans Serif", 7.8F, System::Drawing::FontStyle::Regular, System::Drawing::GraphicsUnit::Point,

static\_cast<System::Byte>(0)));

this->DeleteButton->ForeColor = System::Drawing::SystemColors::ControlText;

this->DeleteButton->Location = System::Drawing::Point(10, 480);

this->DeleteButton->Name = L"DeleteButton";

this->DeleteButton->RightToLeft = System::Windows::Forms::RightToLeft::No;

this->DeleteButton->Size = System::Drawing::Size(110, 60);

this->DeleteButton->TabIndex = 5;

this->DeleteButton->Text = L"Очистить список покупок";

this->DeleteButton->UseVisualStyleBackColor = false;

this->DeleteButton->Click += gcnew System::EventHandler(this, &MainWindow::DeleteButton\_Click);

//

// PackageCheck

//

this->PackageCheck->AutoSize = true;

this->PackageCheck->Location = System::Drawing::Point(10, 30);

this->PackageCheck->Name = L"PackageCheck";

this->PackageCheck->Size = System::Drawing::Size(69, 20);

this->PackageCheck->TabIndex = 6;

this->PackageCheck->Text = L"Пакет";

this->PackageCheck->UseVisualStyleBackColor = true;

this->PackageCheck->CheckedChanged += gcnew System::EventHandler(this, &MainWindow::PackageCheck\_CheckedChanged);

//

// PriceBox

//

this->PriceBox->BackColor = System::Drawing::SystemColors::Menu;

this->PriceBox->BorderStyle = System::Windows::Forms::BorderStyle::None;

this->PriceBox->FormattingEnabled = true;

this->PriceBox->ItemHeight = 16;

this->PriceBox->Location = System::Drawing::Point(336, 30);

this->PriceBox->Name = L"PriceBox";

this->PriceBox->Size = System::Drawing::Size(202, 448);

this->PriceBox->TabIndex = 7;

//

// label1

//

this->label1->AutoSize = true;

this->label1->Location = System::Drawing::Point(147, 502);

this->label1->Name = L"label1";

this->label1->Size = System::Drawing::Size(130, 16);

this->label1->TabIndex = 8;

this->label1->Text = L"Общая сумма чека:";

//

// PriceTotal

//

this->PriceTotal->AutoSize = true;

this->PriceTotal->Location = System::Drawing::Point(285, 502);

this->PriceTotal->Name = L"PriceTotal";

this->PriceTotal->Size = System::Drawing::Size(14, 16);

this->PriceTotal->TabIndex = 9;

this->PriceTotal->Text = L"0";

//

// SaveButton

//

this->SaveButton->BackColor = System::Drawing::Color::Coral;

this->SaveButton->Cursor = System::Windows::Forms::Cursors::Hand;

this->SaveButton->FlatAppearance->BorderColor = System::Drawing::Color::White;

this->SaveButton->FlatStyle = System::Windows::Forms::FlatStyle::Popup;

this->SaveButton->Font = (gcnew System::Drawing::Font(L"Microsoft Sans Serif", 7.8F, System::Drawing::FontStyle::Regular, System::Drawing::GraphicsUnit::Point,

static\_cast<System::Byte>(0)));

this->SaveButton->ForeColor = System::Drawing::SystemColors::ControlText;

this->SaveButton->Location = System::Drawing::Point(130, 550);

this->SaveButton->Name = L"SaveButton";

this->SaveButton->RightToLeft = System::Windows::Forms::RightToLeft::No;

this->SaveButton->Size = System::Drawing::Size(408, 75);

this->SaveButton->TabIndex = 10;

this->SaveButton->Text = L"Завершить заполнение чека,\r\nсохранить чек и перейти к оплате\r\n";

this->SaveButton->UseVisualStyleBackColor = false;

this->SaveButton->Click += gcnew System::EventHandler(this, &MainWindow::SaveButton\_Click);

//

// MainWindow

//

this->AutoScaleDimensions = System::Drawing::SizeF(8, 16);

this->AutoScaleMode = System::Windows::Forms::AutoScaleMode::Font;

this->BackColor = System::Drawing::SystemColors::ActiveCaption;

this->ClientSize = System::Drawing::Size(550, 650);

this->Controls->Add(this->SaveButton);

this->Controls->Add(this->PriceTotal);

this->Controls->Add(this->label1);

this->Controls->Add(this->PriceBox);

this->Controls->Add(this->PackageCheck);

this->Controls->Add(this->DeleteButton);

this->Controls->Add(this->ButtonHide);

this->Controls->Add(this->ProjectLabel);

this->Controls->Add(this->ExitButton);

this->Controls->Add(this->ProductList);

this->Controls->Add(this->ButtonAdd);

this->FormBorderStyle = System::Windows::Forms::FormBorderStyle::None;

this->Name = L"MainWindow";

this->StartPosition = System::Windows::Forms::FormStartPosition::CenterScreen;

this->Tag = L"АРМ";

this->Text = L"АРМ";

this->ResumeLayout(false);

this->PerformLayout();

}

#pragma endregion

private: System::Void ExitButton\_Click(System::Object^ sender, System::EventArgs^ e) {

Application::Exit();

}

private: System::Void button1\_Click(System::Object^ sender, System::EventArgs^ e) {

Food temp;

this->ProductList->Items->Add(msclr::interop::marshal\_as<System::String^>(temp.GName()));

(\*List).push\_back(temp);

this->PriceBox->Items->Add(temp.GPrice());

this->FinalPrice += temp.GPrice();

this->PriceTotal->Text = msclr::interop::marshal\_as<System::String^>(std::to\_string(FinalPrice));

}

private: System::Void ButtonHide\_Click(System::Object^ sender, System::EventArgs^ e) {

this->WindowState = System::Windows::Forms::FormWindowState::Minimized;

}

private: System::Void DeleteButton\_Click(System::Object^ sender, System::EventArgs^ e) {

this->ProductList->Items->Clear();

this->PriceBox->Items->Clear();

(\*List).clear();

this->PackageCheck->Checked = false;

FinalPrice = 0;

this->PriceTotal->Text = msclr::interop::marshal\_as<System::String^>(std::to\_string(FinalPrice));

}

private: System::Void PackageCheck\_CheckedChanged(System::Object^ sender, System::EventArgs^ e) {

if (this->PackageCheck->Checked){

FinalPrice += 5;

Package = true;

}

else {

FinalPrice -= 5;

Package = false;

}

this->PriceTotal->Text = msclr::interop::marshal\_as<System::String^>(std::to\_string(FinalPrice));

}

private: System::Void SaveButton\_Click(System::Object^ sender, System::EventArgs^ e) {

if (FinalPrice != 0) {

//std::string temp1 = msclr::interop::marshal\_as<std::string>(DateData);

SYSTEMTIME st;

GetSystemTime(&st);

string buffer;

string FileName = to\_string(st.wSecond) + "sec " + to\_string(st.wMinute) + "min " + to\_string(st.wHour) + "hour " + to\_string(st.wDay) + "," + to\_string(st.wMonth) + "," + to\_string(st.wYear) + ".txt";

fstream stream(FileName,std::ios::out);

stream << "Кассир:" << "admin" << endl;

stream << "Наименование товара " << "Цена товара" << endl;

for (int i = 2; i < (\*List).size(); i++) {

buffer = (\*List)[i].GName() + " " + to\_string((\*List)[i].GPrice());

stream << endl << buffer;

}

if (Package)

stream << endl << "Пакет " << "5" << endl << endl;

stream << "Итоговая сумма чека: " << FinalPrice;

stream.close();

this->ProductList->Items->Clear();

this->PriceBox->Items->Clear();

(\*List).clear();

this->PackageCheck->Checked = false;

FinalPrice = 0;

this->PriceTotal->Text = msclr::interop::marshal\_as<System::String^>(std::to\_string(FinalPrice));

}

}

};

}

**Food.h**

#pragma once

#include <iostream>

#include <ctime>

class Food

{

protected:

std::string Name;

float Price;

const std::string Prod[5] = { "Milk ","Waffles","Cheese ","Egg ","Bread " };

const float Pric[5] = { 15.2,100.1,8.41,1.1,22.8 };

public:

Food() {

int randnn = rand()%5;

Name = Prod[randnn];

Price = Pric[randnn];

}

Food(std::string N, float P) {

Name = N;

Price = P;

}

~Food() {}

std::string GName() {

return this->Name;

}

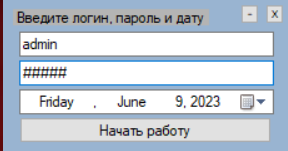
float GPrice() {

return this->Price;

}

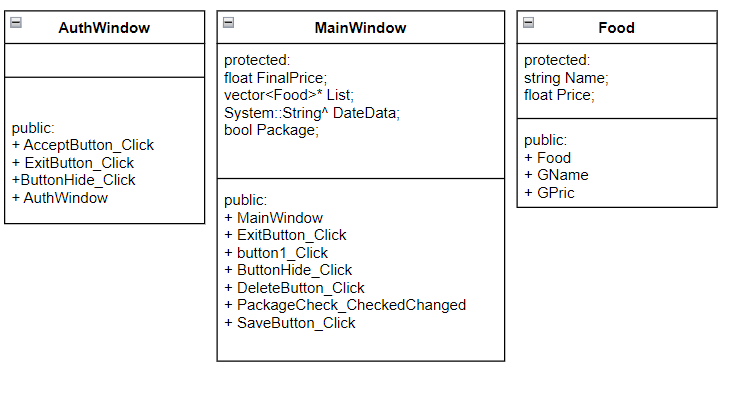
};

**Вывод программы**

****

****

**UML диаграмма**

****

**Вывод**

Программа успешно выполняет свою задачу.