

# «Travel-Clock» Desktop application

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**Abstract**—The desktop application for checking time in different time zones is purposed. This application is intended for tourists and people who needs to view the current time in different places of the globe depending on the time zone in that area.

## I. INTRODUCTION

The clock was and remains one of the most necessary and useful gadgets on the desktop. It allows you to monitor the time quickly and it is a decoration for the desktop at the same time. The clock can have a variety of additional functions, for example, allows you to count the time that the user spends in the Internet or the computer's operating time. Some clocks allow you to set the timer to turn off the computer, put it into sleep mode, or reboot.

Most applications with checking the current and world time are designed for mobile phones, mainly for the operating systems such as "Android" and "iOS".

There are many this type desktop applications designed for different kinds of platforms (Windows, Linux) and cross-platform. Let's consider some of them.

Fans of the Mozilla Firefox browser may like Firefox Clock (A) [1]. The watch has six different skins with the logo of the Mozilla Firefox browser. In the clock you can turn on or, conversely, turn off the second hand, set the time zone and, if the user wishes, sign the clock.

CountDown Timer (B) [2] - countdown timer for the Windows operating system with the ability to show time. Countdown Timer works like many other applications with the same function. You can specify the date for the countdown in the settings. You can add a comment to it. The gadget's working window will display information about the number of days, hours, minutes and seconds left before the specified date. The current time is displayed in the bottom of the window.

Free Desktop Clock (C) is a small program that allows you to diversify the look of the clock located in your system tray. You can replace the standard clock with one of the various options offered by the program. Free Desktop Clock not only makes your clock beautiful and unique, but also automatically adjusts the computer system time via the Internet. However, these applications do not allow you to choose time zones.

Similarities and differences of the above software products are presented in Table I.

TABLE I. COMPARISON OF APPLICATIONS

COMPARATIVE EVALUATION	APPLICATIONS		
	A	B	C
Different skins	Yes	No	No
Animation	No	Yes	No
Switch language	Yes	Yes	No
Simple and easy interface	Yes	Yes	Yes

In addition to the reviewed applications, there are many others with different functionality and purpose, for example the gadget "Clock GTA 4" was specially designed for fans of this computer game, and Liverpool FC Clock was specially created for football fans.

The offered software app differs from other applications in development for using on personal computers and it can serve to decorate the desktop, that is, you can select not only the time zone that you are interested in, time change settings (summer time, user time) and language (Russian / English), but also, get additional decoration for your desktop.

## II. MAIN PART

We offer a desktop application "Travel-Clock". This application is intended for tourists and those people who need to view the current time in different places of the globe, depending on the time zone in this area. The application allows you to select more than 80 time zones.

The developed software product offers the user to set his time and start the clock from this position, set the system time and start the clock from the current system time, as well as select the time zone relative to the system time and switch to summer time. In addition, since the application is designed for using by tourists, it allows you to switch the interface language from Russian to English.

A distinctive feature of the development is the ability, after changing the time zone, to find out whether there is or not using the transition to summer time. In most applications of this type, when you select the time zone, the time is already displayed, taking into account the transition to summer mode. However, this is not always convenient for the user, especially if you need to compare the time difference.

The main purpose of the development of the software "Travel-Clock" - the access for the user to view the time in the selected time zone anywhere in the world.

This software product was developed based on the C ++ / CLI programming language using the Microsoft Visual Studio 2015 development environment.

Figure 1 shows the sequence diagram of the application. The Main () method is the entry point to the application. Next, the existing controls on the form are initialized, and an instance of the Clock class is created. We will consider this sequence of user actions: clicking the "Start the system clock" button, after that, we press the button "Start the custom clock", then we select any time zone from the offered list. Then, the first choice, the Refresh () method will be activated, since the timer starts, which redraws the image on the form every second. To correctly draw the clock hands, we call the DrawTimer1() method of the Clock class, which, using the Graphics object, displays the hands on the desired positions.

When the "Start the custom clock" button is selected, the Init() method will be called, with the parameters that the user has sent. These values will be used to calculate the coordinates of the hands. Then the timer, which reproduces the image on the form every second, starts again. To correctly draw the clock hands, we call the DrawTimer1() method of the Clock class, which, using the Graphics object, displays the hands on the desired positions.

When you select any time zone, the ReturnGrin() function is called, which returns the GMT, after which, we call the Init() method, with parameters that are specific to the selected time zone.

We start the timer, which redraws the image on the form every second. And we call the DrawTimer1() method of the Clock class, which, using the Graphics object, displays the hands on the desired positions.

The app generates a window with an animation clock, buttons that perform the basic functions of the app, as well as fields for selecting more than 80 time zones.

The "Start the custom clock" button is responsible for starting the timer, which ensures the movement of the hands of the clock every second, beginning with the time that the user entered into the three input fields and until the user closes the window form or presses the "Stop clock". The "Stop Clock" button stops the timer and the movement of the clock hands. To start the time in the form, which is synchronized with the operating system time, you need to click the "Start the system clock" button, in this case, the timer is also started, thanks to which the hands on the clock start their movement. There is also a choice of the language of the user interface in the form, represented by two inscriptions. When you click on the "Russian" button, the interface changes all the labels on the controls to Russian. When you click on the "English" button, the user interface changes to English.

There is also a list of available time zones on the bottom of the form. If you click on any of them, the timer will start,

which will start the movement of the hands from the time specified in that time zone.

Under the "Stop Clock" button there is a field for entering the information about whether summer time is present in the time zone selected by the user. If the answer is yes, "+1" is displayed, which means that by the time displayed on the clock, we need to add 1 hour during the summer period.

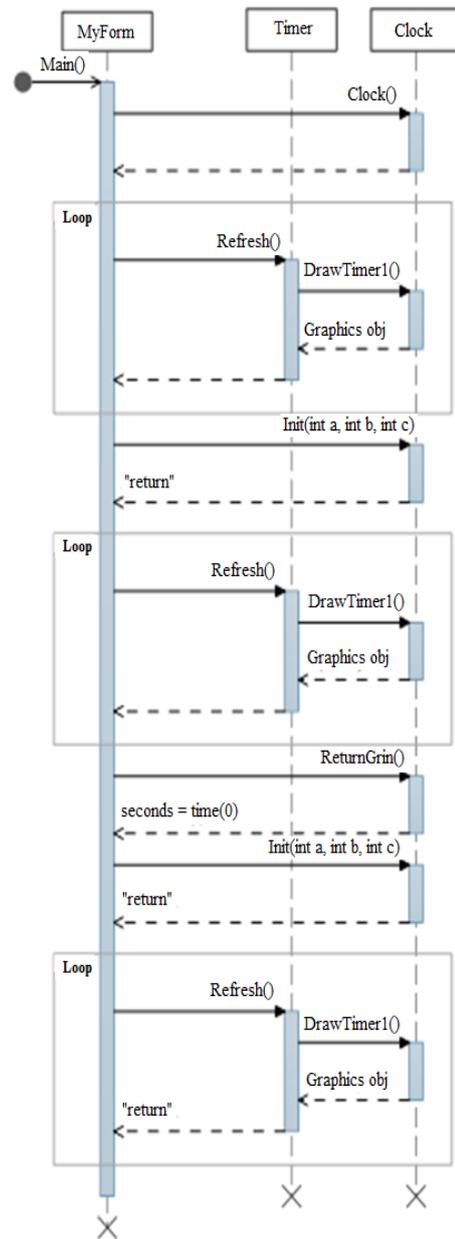


Fig. 1. The sequence diagram

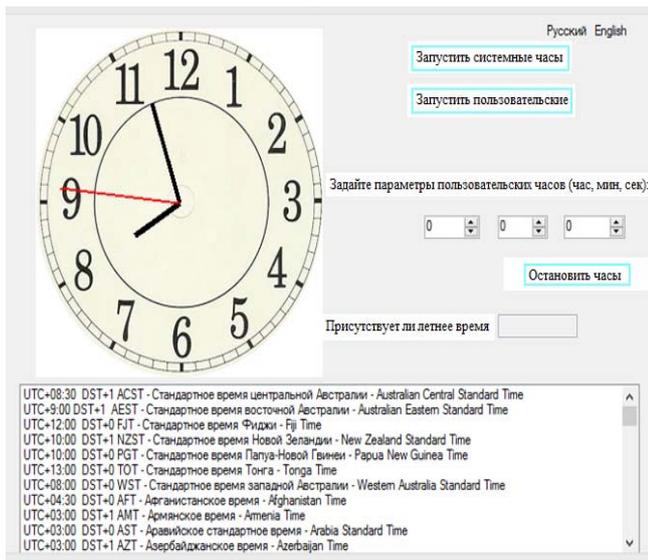


Fig. 2. Screen form of the running application

### III. CONCLUSION

To summarize, we can say that "Travel-clock" is a free desktop app for checking time in different time zones. The peculiarity of the app is that if we change the time zone the presence or absence of summer time will be indicated. This app is a good choice for people who needs quickly to find out the time for different time zones around the world, taking into account the transition to summer time.

### REFERENCES

- [1] Firefox Clock <https://addons.mozilla.org/en-US/firefox/tag/clock>
- [2] Countdown Timer - <https://www.online-stopwatch.com/countdown-timer/>
- [3] Derek House. Greenwich time and the opening of the longitude. Greenwich time for the whole world <http://www.12apr.su/books/item/f00/s00/z0000006/st009.shtml>
- [4] Time zones of the world, GMT now <http://www.gmt.su/time-zones>