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ALARM CLOCK

Introduction

Alarm clock is used by millions of users around the world. Our ancestors have been using an alarm clock, going back to its 2,000 years long history but over time, the new advancements in technologies allow us to keep an alarm clock without it containing a dial, gear trains etc.

The objective of this project is to implement an alarm clock that works in 12-hour format using Python. Alarm clock app is very simple to make in python. Python consists of some very innovative libraries and modules such as Datetime, Winsound and Tkinter which helped us to build the project using the current date and time as well as to provide a user interface to set the alarm according to the requirement in 12-hour format.

On opening the app the user is asked to enter the time when they want to wake up in the 2 boxes labeled hour and minute in 12-hour format as well as select am/pm using the combobox. The user gets a notification that alarm has been set. At the set time, the user receives another notification “Wake up sleepyhead” and a beeping sound is produced which goes on for 10 seconds.

Prerequisites

This project requires good knowledge of Python and GUI (Graphic User Interface). Knowledge about Datetime module and winsound module are also required.

Software and Hardware requirements

A pc with python installed is required to run this app.

Why Python

Python has been chosen as the programming language because of its

simple syntax, it's user friendly nature, and large collection of libraries and modules. Python when combined with one of its most popular libraries tkinter provides a fast and easy way to create GUI applications. Tkinter provides a powerful object-oriented interface to the Tk GUI toolkit which can be used to create beautiful apps. It gave me access to Messagebox and Ttk which can be used to add additional features like notifications, comboboxes which gives the app a professional look. Winsound module provides very useful functions and methods to create sound interface in python. For the purpose of this program beep function has been used. Datetime module provides us with the current time and date.

Algorithm

1. Import all the required modules and libraries- tkinter,datetime, messagebox of tkinter, ttk of tkinter and winsound.
2. Create a window having geometry 400x200 and title alarm clock using geometry and title methods of Tk.
3. Define a function alarm that takes zero parameters.
 - a. Check if the combobox c1 is set at AM using get() method.
 - b. If true get values of hour and minute from entries e1 and e2 respectively, convert them to integers using int function and store in variables x and y respectively.
 - c. Else if combobox is set at PM, get values of hour and minute from entries e1 and e2 respectively and convert them to integers using int function.
 - d. Add 12 to the number obtained from e1 and store in variable x. Store number from e2 in y.
 - e. Create a pop up message called notification saying "alarm has been set" using showinfo.
 - f. Using while loop, while True, check if x is equal to the current hour using now().hour method of datetime module and if y is equal to the current minute using now().minute method of datetime.
 - g. Create a pop up message called notification saying "WAKE UP

SLEEPY HEAD” using showinfo.

- h. Using for loop, for i in range 0 to 100, create a beeping noise that
lasts for 1 second using Beep function of winsound.
- i. Break the while loop.
4. Create a label l1 in obj containing text “HOURS:” using Label method.
5. Create a label l2 in obj containing text “MINUTES:” using Label method.
6. Using grid, place l1 in the zeroth row and zeroth column.
7. Using grid, place l2 in the first row and zeroth column.
8. Create two entries e1 and e2 using Entry method.
9. Using grid, place e1 in the zeroth row and first column and e2 in the first row and first column.
10. Create a button b1 in obj with text “SET ALARM” and alarm Function call as command using Button method.
11. Using grid, place b1 in the second row and first column.
12. Create a combobox c1 in obj with values [“AM”, “PM”] using combobox method
13. Using grid place c1 in the zeroth row and second column.
14. Create a label l3 in obj with text “AM OR PM” using Label method.
15. Using grid place l3 in the zeroth row and third column.
16. Call obj.mainloop.

Modules used and their function

1. Tkinter- for GUI interface, to access modules to create the app.
2. MessageBox- for creating notifications to inform the user that alarm has been set and to inform the user that time is up.
3. Ttk- for creating the labels, comboboxes etc.
4. Datetime- for finding the current time and date
5. Winsound- for creating the alarm sound.

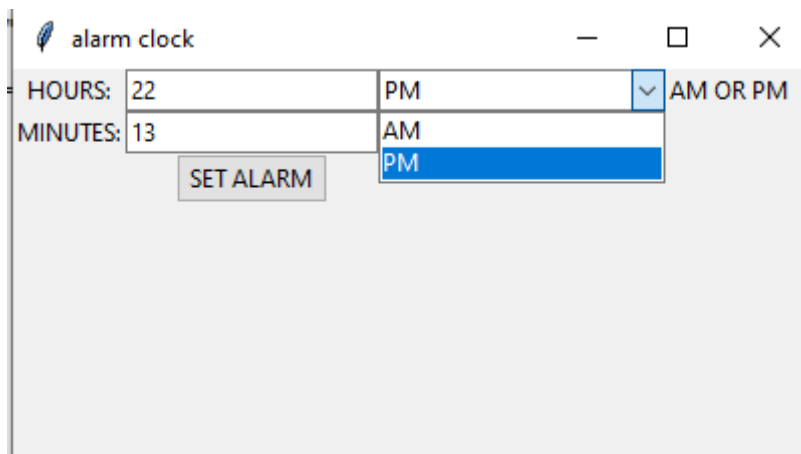
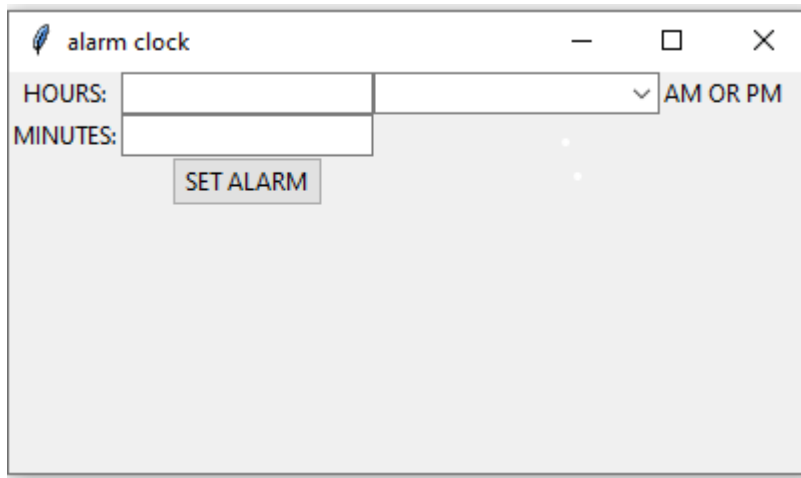
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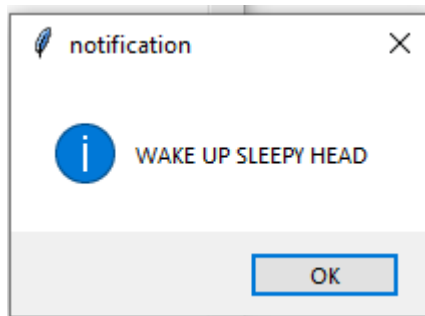
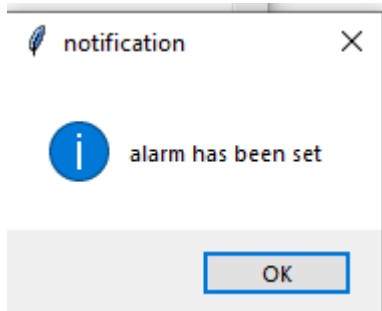
```
from tkinter import *
import datetime
from tkinter.messagebox import *
from tkinter.ttk import *
import winsound
obj=Tk()
obj.geometry("400x200")
obj.title("alarm clock")
def alarm():
    if c1.get()=="AM":
        x=int(e1.get())
        y=int(e2.get())
    if c1.get()=="PM":
        x=int(e1.get())+12
        y=int(e2.get())
    showinfo("notification","alarm has been set")
    while True:
        if x==datetime.datetime.now().hour and y==datetime.datetime.now(
        ).minute:
            showinfo("notification","WAKE UP SLEEPY HEAD")
            for i in range(0,100):
                winsound.Beep(10000,100)
            break
l1=Label(obj,text="HOURS:")
l2=Label(obj,text="MINUTES:")
l1.grid(row=0,column=0)
l2.grid(row=1,column=0)
e1=Entry(obj)
```

```
e2=Entry(obj)
e1.grid(row=0,column=1)
e2.grid(row=1,column=1)
b1=Button(obj,text="SET ALARM",command=alarm)

b1.grid(row=2,column=1)
c1=Combobox(obj,values=["AM","PM"])
c1.grid(row=0,column=2)
l3=Label(obj,text="AM OR PM")
l3.grid(row=0,column=3)
obj.mainloop()
```

Output





Advantages

1. The project is very easy to create using python and tkinter.
2. All the modules used need not be downloaded beforehand like the other libraries like NumPy, thus this project is user friendly and accessible in any virtual environment used for python programming.
3. The app is very simple to use.
4. The app is simple and elegant.

Limitations (further development areas)

1. The time entered must be in 12 hour format. Entering time in military format will cause an error and app may crash.

2. The app doesn't provide any options for the sound produced when it is time to wake up.
3. The alarm cannot be stopped by the user. The sound will play for 10 seconds.

Technical feasibility:

The proposed alarm clock shall be installed in a Personal system. A computer system of the configuration given below should be installed:

- ☐ A PC with version above Windows 10
- ☐ Electricity supply

The necessary hardware and software supporting the implementation of the proposed is present and hence the app is technically feasible.

Economic feasibility:

The developed program requires basic costs of setting up of a system, with the required hardware and software, and costs of power supply. The clock app shall be available for free to the end user and it requires a simple programmer to use and hence is economically feasible.

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