

LITTLE ROCK INDIAN SCHOOL

Brahmavar - 576213



CERTIFICATE

CLASS XII

COMPUTER SCIENCE PROJECT

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*This is to certify that Melroy Dsa has satisfactorily completed a Minor project “ **Musicatronix** ” in Chemistry under my supervision at LRIS, Brahmar during the year 2019 -2020*

Project In-charge:- Mrs. Sona Maria Fernandes

Submitted to the AISSCE Practical Examination held on _____ at LRIS, Brahmar.

Reg. No.:-

Examiners:- 1) _____

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Aim

AIM

The aim is to create a virtual university of music with an inbuilt virtual keyboard and other functions.

Introduction

INTRODUCTION

Music is one of the most ancient and evolved practice ever to be done by humans. It is a primal force which brings together people alienated by other barriers and strengthens the humanitarian quality in everyone. Similarly technology is bringing people together at a rapid pace. On bringing these two attributes of modern society, wonders can be achieved.

C++ was developed at AT&T Bell laboratories in the early 1980s by Bjarne Stroustrup. “C with classes” was the name with which it was called before since it had added the concept of classes to C programming language. More specifically, it had introduced **Object oriented programming (OOP)** and its concepts **Data Abstraction, Modularity, Polymorphism, Encapsulation and Inheritance**. This was a way to bridge gap between the programming world and the real world, that is, to implement real world concepts in programming.

In the modern era, where people want to get things done easily and rapidly, the musical world is no different. The recording, Playback, Mixing Industries have rapidly evolved from huge professional studios to compact home studios. DAW's have brought forward an easy way to score for films and musical software's are starting to become the new trend.

“MUSICATRONIX” is simple music software developed by using C++. This software has been designed to expose people to the pleasure of learning music at home. This Application is filled with fun options like virtual keyboard, virtual guitar, recording the songs etc. Students who are completely unaware of music can also benefit from this as the Keys of the Keyboard are provided with their specific names like A, B etc. Overall it's a fun filled educative application towards music which will enhance the students ability to learn music, apply it and eventually become an expert in music.

Basic Principles And Working

BASIC PRINCIPLES AND WORKING

Basic Principles :

Working:

I. Login page

Two options here.

1. User doesn't have an account so he signs up, this goes to a different window where user's personal info like First name, Last name, Username and Password is entered. Here, once the user has entered all the information, the compiler checks if the following criteria is met.
 1. If the username already exists in the file
 2. Username entered is too short
 3. Password is not strong enough
 4. Password and Confirm Password do not match.If any of the criteria is met, it gives an error message. Else it writes everything into file and goes to next step.
2. If User has an account, He can login by using his username and password. When the user logs in, Compiler checks if the specific username and password is there in file by reading it as many times till it finds the username. Once it does, those many bytes are read into the object and compiler stops reading.

II. Animation

If the user has opted for Sign up option and successfully completed it, Then A welcome animation shows up with logo of the school, name of the creators and the person who guided us Mrs Sona and Musicatronix logo accompanied by the theme song.

If the user has successfully logged in, the Musicatronix logo along with theme song is executed.

We included header files like graphics.h, dos.h, process.h and alloc.h and functions like sound(), nosound(), delay() etc.

III. The main menu consists of

1. Keyboard
2. Guitar
3. Recorded songs
4. Recorder

5. About
6. Exit

We used functions `initmouse()` and `showmouseptr()` to enable the mouse. Then we check if the left button of the mouse is clicked. If it is clicked, then compiler checks whether the coordinate grid matches with the if condition of the if else ladder.

Option 1: Here, The screen gets loaded up with keyboard and the user defined function `keyboard()` is called.

Virtual keyboard is displayed on the screen by using some of the functions under the header file `graphics.h`. The keyboard works on the concepts of switch case. If a particular key on the PCs keyboard is pressed, the compiler enters a while loop and keeps going in the loop till Esc key is pressed. If another key is pressed, the compiler checks if the key is there in switch case. If it is there, the animation of the key being pressed is shown followed by the sound of the note and note is displayed inside the note box.

Inscribed on the keys are the notes of that particular keys and on top of the keyboard are the alphabets which are supposedly pressed on the PCs keyboard for the note to be given as an output.

If the user presses the Esc button, it goes back to the main menu.

Option 2: Here, the function `guitar()` is called and guitar loads up on the screen. The logic behind the mouse is applied here. If the left button of the mouse is clicked, then compiler checks whether coordinate grid matches with the if condition of the particular note.

If it matches, the colour of that particular part of the string changes to white using `setfillstyle()`. Then the sound of the particular note is played by passing the frequency of that particular note to the sound function. Then the note is displayed in the note box.

Option 3: The function `recordson()` is called. In this, the user will be taken into a new window where he can choose between three options

1. Keyboard
2. Guitar
3. Exit

If the user selects the keyboard option, the compiler opens the designated part of the file where song is stored. When it opens, the compiler compares the instrument of the song (`character array(strcmpi())`) with the word “keyboard” and if it matches, the information about the song will be displayed, that is, song name, user name, date and time of the song being recorded. Now the concept of switch case comes into play.

If the person presses Esc, The song information window exits and it goes back to recorded songs menu. If they press letter 'Z' on the keyboard, the song gets played. If they press the letter 'A' or 'D' it goes back to the previous song or the next song respectively and that song info is displayed.

Under Guitar, Everything is same as that in the keyboard option except for one thing. Here, instead of the word "keyboard", the word guitar is used to compare and then execute.

If the person presses Escape area , then they go back to the main menu.

Option 4: The function recorder() is called.

In this, the user will be taken into a new window where he can choose between three options

1. Keyboard
2. Guitar
3. Exit

If the user presses the keyboard option, the function keyrecord() is called. This function uses the same concept as the function keyboard() with some modifications. A small instruction panel is displayed on the top right corner. In the middle, Record button, Play Button and stop button are displayed through graphics. For recording, press the alphabet 'Z' on the keyboard. When Z is pressed the frequency played by the key is stored in a floating point array. 'B' is used to play the recorded song. Once B is pressed, it plays all the frequencies placed in the array by passing them as parameters to the sound function in a loop. 'V' is used to reset the array, that is, Delete the frequencies stored in the array. 'N' is pressed to save the song. When we press 'N' a new window opens up where the user has to type the name of the song. After this, it goes to another menu where the information of the song is displayed. Here 'Z' plays the recorded song. After user presses the ESC, it goes back to the keyboard recorder. Upon pressing ESC again, it goes back to recorder option.

If the user presses the guitar option, the function guitarecord() is called. This function uses the same concept as the function guitar() with some modifications. At the bottom of the screen, Record button, Play Button and stop button are displayed through graphics. Here the logic behind mouse is applied. If the recorder button is pressed and if any note is pressed, the frequency of that note will be saved in a floating point array. If the play button is pressed, the song recorded gets played and

if the stop button is pressed, a new window opens up where the user has to type the name of the song.

After this, it goes to another menu where the information of the song is displayed. Here 'Z' plays the recorded song. After user presses the ESC, it goes back to the guitar recorder. If the user presses the 'X' at top corner, it goes back to the recorder menu.

If the person presses Escape area, then they go back to the main menu.

Option 5: If About is selected, then the function About gets invoked, and information about creators and purpose of the game is displayed.

Option 6: If Exit is selected, Then the application gets closed.

Algorithm

ALGORITHM

Step 1: Login

 Call the login function

Step 2: if new user

 Call new user function

Step 3: Type user information

Step 4: Graphical introduction

Step 5: Display The Main Menu

 1. Keyboard

 2. Guitar

 3. Recorded songs

 4. Recorder

 5. About

 6. Escape

Step 6: Select Graphical representation of Option

Step 7: if 'keyboard' then

 Invoke keyboard function

Step 8: Press Key

Step 9: if keypressed is true

 Display animation and play sound

 Goto step 8

Step 10: If keypressed is ESC

 Goto step 5

Step 11: if 'guitar' then

 Invoke guitar function

Step 12: Press x,y using mouse

Step 13: If x AND y = ESC

Goto step 5

Step 14: if x AND y is true

Display animation and play the sound

Goto step 12

Step 15: if 'recorded songs' then

Invoke the recorded songs function.

Step 16: if 'keyboard' then

Display song recorded with keyboard

Step 17: if 'guitar' then

Display song recorded with guitar

Step 18: if 'Exit' then

Goto step 5

Step 18: if key = Esc

Goto step 15

Step 19: if key= 'z'

Play the song

Step 20: if key = 'a'

Display previous song

Goto step 17

Step 21: if key = 'd'

Display next song

Goto step 17

Step 22: if 'recorder'

Invoke recorder function

Step 23: if 'keyboard' then

Invoke keyboard recorder function

Goto step 25

Step 24: if 'guitar' then

Invoke guitar recorder function

Goto step 32

Step 25: Press Key

Step 26: if keypressed is true

Display animation and play sound

Goto step 25

Step 27:if keypressed='z'

Record song

Step 28: if keypressed='b'

Play recorded song

Step 29:if keypressed='v'

Reset song

Step 30:if keypressed = 'n'

Goto step 38

Goto step 23

Step 31:if keypressed is Esc

Goto step 22

Step 32: Press x,y using mouse

Step 33: if x AND y is true

Display animation and play the sound

Step 34: if x and y= recordsong

Song starts recording

Step 35: if x and y = playsong

Song starts playing

Step 36: if x and y = save song

Goto step 38

Goto step 24

Step 37: if x and y= Exit

Goto step 22

Step 38: Save song function is invoked

step 39: if 'about' then

invoke about function

goto step 5

step 40: if 'exit' then

exit

