Working

Name: SMART CLASS APPLICATION

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PRE-REQUISITES:

1. All the to-be-connected devices must be on th same WiFi Network
2. File Sending and WhiteBoard compulsorily requires a teacher

Let's see the working of every feature one by one:

MODE - 0 : TEACHER AND MODE – 1 : STUDENT

1) Public Discussion
    - This page deals with all the discussion that is done in open and is visible to everyone
    - The sender sends a UDP packet with the header as his own name followed by a slash
      Header = name/message
    - These types of packets are categorised as public packets
    - Upon its reception, the data is separated from the name and is added to the device SQLlite database

- It then gets added to the list adapter which gets updated and displays the newly displayed message
- Addition of duplicate data packets is avoided by matching the data and respective timestamp.
- While sending a new message the device keeps of generating and sending packets till it successfully receives the packet that it itself had sent
- Thus packet loss is tending towards 0.

2) Private Discussion
    - In case of teacher this page generates the list of all the students currently connected on that network
    - From this the teacher can select one student to message
    - The sent messages are UDP packets of the below form -pm/:ip_of_recipient#nameofsender/message
    - So every device receiving this packet checks if his ip address matches that of the recipient.
    - If it matches then it generates a notification as well as adds the message to the database
    - Similarly the sender adds this message to his database
    - Accordingly the sender and recipients list adapters are updated and message is shown to both sides

3) WhiteBoard
    - Only Teacher has the access to draw on whiteboard
    - Whatever is drawn by the teacher is replicated on the student side
    - There are three main touch events that occur. Viz.:TOUCH_DOWN,TOUCH_MOVE,TOUCH_UP
    - TOUCH_DOWN triggers the start of a new path by moving its x and y co-ordinates to the point where it is touched
    - TOUCH_MOVE is triggered after touch_down occurs it continuously draws the pixels and goes on making lines with the previously set x and y of the path

- Finally the TOUCH_UP resets the path so that again new path can be started from next operation
- Features:
    - COLOURS:
      There is a facility to change colours by pressing the menu button.
      This saves the previous path and assigns the selected colour from the next operation
    - WIDTH :
      This feature works similar to Colours where the user is provided with a option to select width which is incorporated from the next path
    - UNDO:
      This feature requires that a stack is continuously maintained which contains all the paths drawn till now.
      And everytime undo is called the latest path is removed
    - REDO:
      For this feature we have to maintain a structure of undone paths which contains all the paths that have been undone using UNDO command.
      So latest undone path is selected and executed again
- The UDP packet for WhiteBoard is of the form

  -board/<identify><colour><width>?<x><y>

  The chracters can take the following values

  <identify>

  s=start

  u=Up

  m=Move

  n=undo

  r=redo

  <colour>

r=Red

b=Black

u=Blue

g=Green

w=White

<width>={1,2,4,6,8,10,12,14,16}

<x><y>=X and Y co-ordinates of the touch events

- Upon reception of such packets the student side process separates all these fields
- Then it sets the color and width according to that obtained from the packet
- The identify character determines which operation to perform.

4) Files
   - Only teacher is allowed to push Files
   - Selection of files takes place by simple FileChooser class
   - After selecting the file to be sent a UDP packet is sent from teacher which is of the form: -file/<name of file>
   - This informs the listeners that they may connect on a predecided socket(In this case 13267)
   - So the Client Server Architecture is used in this transfer where multiple clients can access the file from the server by using a separate thread for every client
   - After establishing a connection the transfer takes place and corresponding file is sent from the teacher.
   - BufferedStream is used so that the bytes are properly handled
   - When all the bytes are read then it checks if a folder called SmartClass exists at path-/sdcard/SmartClass/
     If not then the folder is created and file is stored in it.

- Maximum file of size 5 MB can be transferred.

5) Preferences
    - It just consists of two parts
    - Every person can set his /her nickname adhering to the following rules
        - Nickname should contain maximum 8 characters
        - It should not contain any special characters
    - Second part opens up the Gmail so that users can give their feedback