**《Embedded System and Microcomputer Principle》Project Report**

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| **Topic** | **Embedded System and Microcomputer Principle Project Report** | | | | | |
| **Group No.** | **2** | | | | | |
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| 1. **System Function (1%)** | | | | | | |
| Opening the MiniSTM32 board, a top design is shown on the screen. There are several modules, the user, the current time, and some functionalities act as buttons, which will be introduced below.  The first functionality, which looks like the WeChat app, is used to communicate with other users. To be continued…  The second functionality is a calculator, which has three modes, decimal computation, equation solving and binary computation. The decimal computation mode, akin to commonplace calculators used in daily life, is employed for performing arithmetic operations between decimal numbers. It facilitates addition, subtraction, multiplication, and division, as well as exponentiation. Additionally, it accommodates alterations in the order of operations with parentheses. Naturally, this mode supports the amalgamation of integer and decimal operations. The “left” and “right” buttons are responsible for sliding the equation window. Note that if the equation is very long, you can use it moving left or right to see the whole input equation. The “change” button is used to switch the function of the calculator, i.e., decimal computation, equation solving and binary computation mode. In the decimal or binary computation part, once you click the “=” button, the result will be calculated, while in the equation solving part you should double click “=” to make the equation been solved.  The third functionality is an album feature. Upon inserting an SD card and clicking this button, the board will read all the images within the "picture" directory on the SD card and display them on the screen. In addition to full-screen image display, the name of the image and the current playback progress will be shown in the top-left corner of the screen. To enhance user convenience, it supports automatic slideshow of images. Of course, users can also manually navigate through images using the key0 and key1 buttons to switch to the previous or next image.  The fourth functionality is a Tetris game. At the outset, a randomly shaped block descends slowly from the top of the play area. While it is descending, players can use the "turnL" or "turnR" buttons on the screen to rotate the block by 90 degrees, the "left" or "right" buttons to move the block horizontally by one grid unit, or the "c" button at the top of the screen to instantly drop the block to the bottom. When the block reaches the bottom of the play area or lands on top of other blocks, preventing further downward movement, it becomes fixed in place. Subsequently, a new random block appears at the top of the play area and begins to descend. The game concludes when fixed blocks accumulate to the top of the play area, making it impossible to clear lines. When all cells in a horizontal (or vertical) row are filled with blocks, that row is eliminated, contributing to the player's score. Additionally, the top portion features a "p" button for pausing or resuming the game and a "back" button to return to the main interface. On the right side of the screen, a scoreboard displays the current score, and there's an area reserved for previewing the next block to appear. | | | | | | |
| 1. **System Design (2%)** | | | | | | |
| 1.working principle  (a) …  (b) …  (c) …  (d) …  2. system frame diagram  SUB-MODULE  A  SUB-MODULE  C  SUB-MODULE  D  SUB-MODULE  B  You should show a frame diagram which contains all the modules(functions) of the system and the communication signals among them.  3.Sub-module design  The system is divided into …. , they are ....  (a)......  (b)...... | | | | | | |
| 1. **Results (screenshots and hardware photos) (1%)** | | | | | | |
| (1) 2.4G communication (to be continued)  (2) Calculator  image-20231124031649201  (3) Album  电子器材  中度可信度描述已自动生成  (4) Tetris game | | | | | | |
| 1. **Work allocation description (1%)** | | | | | | |
| (1) Member 1: R.X. Jiang, who is responsible for the logical part of calculator, the album, and the Tetris game.  (2) Member 2: Y.J. Zhang, who is responsible for 2.4G communication part.  (3) Member 3: Z.Y. Han, who is responsible for 2.4G communication part.  (4) Member 4: J.C. Luo, who is responsible for the initial screen and the apparency of calculator. | | | | | | |
| 1. **Problems encountered and solutions (1%)** | | | | | | |
| Please record the problems encountered during the procedure of designing and debugging, especially the process that how you solved the problems.  Problem 1:  Solution: \*\*\*\*  Problem 2: \*\*\*\*  Solution: \*\*\*\*\*  ...... | | | | | | |
| 1. **Personal proposal （4%）** | | | | | | |
| Suppose you are instructors of this course, and you need to design a course project, please provide your proposal.  Requirements:   1. The project must be designed based on the MiniSTM32 board used in our Lab. 2. The proposal should use at least one component that we haven’t used before; or use a new development technique, such as parallel processing. 3. If extra device is used, you need to provide the model name and the specification link. 4. You should provide a brief design requirements and discuss about the feasibility of your proposal. 5. Online resource is acceptable, but you must provide the reference (otherwise you get 0 for proposal). | | | | | | |

Please do not paste any codes in the project report!!!

Delete all the red words when submitting!!!