8051
MICROCONTROLLER
QUIZ GAME

Submitted in partial fulfilment of the requirements

of the degree of

BACHELOR OF ENGINEERING
in
INFORMATION TECHNOLGY
(A.Y. 2020-2021)

by

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Choice Based Credit Grading System with Holistic Student Development (CBCGS-H 2019)

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Certificate

This is to certify that Mr. Amar Singh, Mr. Parth Singh, Mr. Shubham Singh, are bonafide students of Information Technology Department, Thakur College of Engineering and Technology, Mumbai. They have satisfactorily completed the requirements of PROJECT Under Project Based Learning as prescribed by **Thakur College of Engineering and Technology (An Autonomous College affiliated to University of Mumbai),** while working on "8051 Microcontroller based Quiz App"

Signature :_____ Signature:_____
Name : Internal Guide's Name Name : Dr. Bijith Markarkandy
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Signature :_____ Signature :_____

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Thakur College of Engineering and Technology, Kandivali (East) Mumbai.

Date:16 /4/20
Place: Mumbai

DECLARATION

I/we declare that this written submission represents my/our ideas in my/our own words and where others ideas or words have been included, I/we have adequately cited and referenced the original sources. I/we also declare that I/we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my/our submission. I/we understand that any violation of the above will because for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

1._____

Amar Singh (Roll No: 35)

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Date:

C O N T E N T S

Chapter 1

SUBJECT NAME AND TOPIC

Topic: 8051 Microcontroller

Quiz Game

1.1 Description

Quiz is an important method of evaluating the success potential of students. This research effort the individuals under consideration were students who would be enrolling in computer courses or Technologies Registrations. A prototype of a web-based placement Quiz system is described from the stand point of the research effort, end-user, and software development. Class Marker's secure, professional web-based Quiz maker is an easy-to-use, customizable online testing solution for business, training& educational assessment with test & Quizzes graded instantly saving your hours of paperwork.

CHAPTER 2

GAME IDEA DESCRIPTION

2 Game Description:

1. Engage your audience

Engage your audience in a unique and fun way and connect them to your brand or learning material. By creating are turning event, you will improve your consumer loyalty.

2. Large number

Once the game is deployed, taking online quizzes makes it possible to have a large number of participants. It could be up to a number of 1000 participants (and even more!). It doesn't matter at what kind of location they take the Quiz.

3. Randomizing questions

It is significant easier to randomize your question with just one click than to do it all mannualy.

Randomizing questions and even answers of those questions are not a lot a of work to do with quizzes. Besides the advantage of time saving, it also helps preventing students from cheating.

2.1 Game Objective:

The Main Objective of Online Quiz is User-friendly systems are not only needed for the creator, but also for participants. Playing Animations and Audio to make the user's experience good. The game checks the answer's provided and views the score accordingly.

This game is a never-ending, as long as user will give correct answer the game will keep on creating questions.

CHAPTER 3

Objective Questions

Sr. No	Question with options	Answer	Cognitive Level
1.	What are the features of 8051 Microcontroller? a) It has two 16-bit Timer/Counter', b) 'It has a 4KB of internal memory (ROM)', c) 'It is an 8-bit processor and 40 pin package d) 'All of the above',	**d)** 'All of the above',	**R**
2.	The 8051 microcontroller is of_____pin package as a processor. a) 20, 1 byte b) 30, 1 byte c) 40, 8 bit d) 40, 8 byte	**c)** 40, 8 bit	**R/U/An**
3.	Which bits of opcode specify the type of registers to be used in the register addressing mode? a) LSB b) MSB c) Both LSB & MSB d) None of the above	**a)** LSB	**R**
4.	What does the symbol '#' represent in the instruction MOV A, #55H? a) Direct datatype b) Indirect datatype c) immediate datatype d) Indexed dataype	**c)** immediate datatype	**R**
5.	-Which base-register is preferred for address calculation of a byte that is to be accessed from program memory by base-register plus register-indirect addressing mode? a. DPTR b. PSW c. PCON d. All of the above	d. All of the above	**R**

6.	What does the symbol '#' represent in the instruction MOV A, #55H? a. Direct datatype b. Indirect datatype c. Immediate datatype d. Indexed datatype	c. Immediate datatype	**R/U**
7.	Which flag allow to carry out the signed as well as unsigned addition and subtraction operations? a. CY b. OV c. AC d. F0	b. OV	**R**
8.	How many bytes are supposed to get occupied while subtracting indirect RAM from an accumulator along with borrow under the execution of SUBB A, @Ri? a. 1 b. 2 c. 3 d. 4	c. 3	**R/U/An**
9.	What can be the oscillator period for the multiplication operation of A & B in accordance to 16-bit product especially in B : A registers? a. 12 b. 24 c. 36 d. 48	d. 48	**R/U**
10.	Which form of instructions also belong to the category of logical instructions in addition to bitwise logical instructions? a. Single-operand instructions b. Rotate instructions c. Swap instructions d. All of the above	d. All of the above	**A/U/An**

11.	Which rotate instruction/s has an ability to modify CY flag by moving the bit-7 & bit-0 respectively to an accumulator? a. RR & RL b. RLC & RRC c. RR & RRC d. RL & RLC	c. RR & RRC	**U/E/An**
12.	Which among the single operand instructions complement the accumulator without affecting any of the flags? a. CLR b. SETB c. CPL d. All of the above	b. SETB	**R/U/An**
13.	What is the counting rate of a machine cycle in correlation to the oscillator frequency for timers? a. 1 / 10 b. 1 / 12 c. 1 / 15 d. 1 / 20	c. 1 / 15	**U/A**
14.	Which special function register play a vital role in the timer/counter mode selection process by allocating the bits in it? a. TMOD b. TCON c. SCON d. PCON	c. SCON	**R**
15.	How many machine cycle/s is / are executed by the counters in 8051 in order to detect '1' to '0' transition at the external pin? a. One b. Two	b	**R**

	c. Four d. Eight		

16.	Which bit must be set in TCON register in order to start the 'Timer 0' while operating in 'Mode 0'? aTR0 b. TF0 c. IT0 d. IE0	d. IE0	**U/A**
18.	Who controls the timer1 especially when it is configured as a timer in mode'0', where gate and TR1 bits are attributed to be '1" in TMOD register? a. TR1 b. External input at (INT1) c. TF1 d. All of the above	b. External input at (INT1)	**R**
19.	Which timer mode exhibit the necessity to generate the interrupt by setting EA bit in IE enhancing the program counter to jump to another vector location? a. Mode 0 b. Mode 1 c. Mode 2 d. Mode 3	c. Mode 2	**R/U**
20.	Match the following : A. JC rel ---------- -- 1. Jump if direct bit is set & clear bit B. JNC rel---------- 2. Jump if direct bit is set C. JB bit, rel --------- -- 3. Jump if direct bit is not set D. JBC bit,rel---------- 4. Jump if carry is set E. JNB bit,rel ---------- 5. Jump if carry is not set Codes: a. A-3, B-2, C-1, D-4, E-5 b. A-5, B-2, C-4, D-1, E-3 c. A-5, B-4, C-3, D-2, E-1 d. A-4, B-5, C-2, D-1, E-3	a. A-3, B-2, C-1, D-4, E-5	**R**
21.	What is the possible range of transfer control for 8-bit relative address especially in 2's complement form with respect to the first byte of preceding instruction? a. -115 to 132 bytes b. -130 to 132 bytes c. -128 to 127 bytes d. -115 to 127 bytes	c. -128 to 127 bytes	**R/U**

22.	Which two bits are supposed to be analysed / tested for unity value (1) in SCON for the reception of byte in mode 1 serial communication? a. RI & TI b. REN & RB8 c. RI & REN d. TI & RB8	b. REN & RB8	**R/U/An**
23.	What is the bit transmitting or receiving capability of mode 1 in serial communication? a. 8 bits b. 10 bits c. 11 bits d. 12 bits	c. 11 bits	**R/U/An**
24.	Which pin in the shift register mode (Mode 0) of serial communication allow the data transmission as well as reception? a. TXD b. RXD c. RB8 d. REN	a. TXD	**R/U/A**
25.	How is the baud rate determined on the basis of system clock frequency (fsc) in accordance to mode '0' of serial communication? a. (oscillator frequency) / 12 b. [2SMOD / 32] x (oscillator frequency) / [12 x (256 – (TH1)] c. [2SMOD / 64] x (oscillator frequency) d. 2SMOD / 32 x (Timer 1 overflow rate)	c. [2SMOD / 64] x (oscillator frequency)	**R**
26.	Why is it not necessary to specify the baud rate to be equal to the number of bits per second? a. Because each bit is preceded by a start bit & followed by one stop bit b. Because each byte is preceded by a start byte & followed by one stop byte c. Because each byte is preceded by a start bit & followed by one stop bit d. Because each bit is preceded by a start byte &followed by one stop byte	c. Because each byte is preceded by a start bit & followed by one stop bit	**R**

27.	Which factor/s is/are supposed to have the equal values at both phases of transmission and reception levels with an intimation of error-free serial communication? a. Baud Rate b. Number of data bits & stop bits c. Status of Parity bits d. All of the above	c. Status of Parity bits	**R/U/An**
28.	Which of the following is not an addressing mode of 8051? a) register instructions b) register specific instructions c) indexed addressing d) none	b) register specific instructions	**R**
29.	The symbol, 'addr 16' represents the 16-bit address which is used by the instructions to specify the a) destination address of CALL b) source address of JUMP c) destination address of call or jump d) source address of call or jump	c) destination address of call or jump	**R**
30.	The storage of addresses that can be directly accessed is a) external data RAM b) internal data ROM c) internal data RAM and SFRS d) external data ROM and SFRS	c) internal data RAM and SFRS	**R/U/An**
31.	The address register for storing the 16-bit addresses can only be a) stack pointer b) data pointer c) instruction register d) accumulator	d) accumulator	**R/U/An**

32.	The address register for storing the 8-bit addresses can be a) R0 of the selected bank of register b) R1 of the selected bank of register c) Stack pointer d) All of the mentioned	d) All of the mentioned	**R**
33.	The instruction, ADD A, R7 is an example of a) register instructions b) register specific instructions c) indexed addressing d) none	b) register specific instructions	**R**
34.	The addressing mode, in which the instructions has no source and destination operands is a) register instructions b) register specific instructions c) direct addressing d) indirect addressing	a) register instructions	**R/U**
35.	RLA instruction performs? a) rotation of address register to left b) rotation of accumulator to left c) rotation of address register to right d) rotation of accumulator to right	b) rotation of accumulator to left	**R/U**
36.	The instruction, ADD A, #100 performs a) 100(decimal) is subtracted from the accumulator b) 100(decimal) is added to contents of address register c) 100(decimal) is added to contents of an accumulator d) none	b) 100(decimal) is added to contents of address register	**R/U/An**
37.	In which of these addressing modes, a constant is specified in the instruction, after the opcode byte? a) register instructions b) register specific instructions c) direct addressing d) immediate mode	a) register instructions	**R**

38.	The only memory which can be accessed using indexed addressing mode is a) RAM b) ROM c) Main memory d) Program memory	c) Main memory	**R/U**
39.	The data address of look-up table is found by adding the contents of a) accumulator with that of program counter b) accumulator with that of program counter or data pointer c) data register with that of program counter or accumulator d) data register with that of program counter or data pointer	a) accumulator with that of program counter	**R/U**
40.	What is the clock source for the timers? a) some external crystal applied to the micro-controller for executing the timer b) from the crystal applied to the micro-controller c) through the software d) through programming	d) through programming	**R**
41.	In the instruction "MOV TH1,#-3", what is the value that is being loaded in the TH1 register? a) 0xFCH b) 0xFBH c) 0xFDH d) 0xFEH	b) 0xFBH	**R**
42.	TF1, TR1, TF0, TR0 bits are of which register? a) TMOD b) SCON c) TCON d) SMOD	a) TMOD	**R/U/An**

43.	Which devices are specifically being used for converting serial to parallel and from parallel to serial respectively? a) timers b) counters c) registers d) serial communication	c) registers	**R/U**

44.	What should be done if we want to double the baud rate? a) change a bit of the TMOD register b) change a bit of the PCON register c) change a bit of the SCON register d) change a bit of the SBUF register	d) change a bit of the SBUF register	**R**
45.	What is a null modem connection? a) no data transmission b) no MAX232 c) the RxD of one is the TxD for the other d) no serial communication	c) the RxD of one is the TxD for the other	**R**
46.	In 8-bit signed number operations, OV flag is set to 1 if: a) a carry is generated from D7 bit b) a carry is generated from D3 bit c) a carry is generated from D7 or D3 bit d) a carry is generated from D7 or D6 bit	a) a carry is generated from D7 bit	**R**
47.	XRL, ORL, ANL commands have ?. a) accumulator as the destination address and any register, memory or any immediate data as the source address b) accumulator as the destination address and any immediate data as the source address c) any register as the destination address and accumulator, memory or any immediate data as the source address d) any register as the destination address and any immediate data asthe source address	b) accumulator as the destination address and any immediate data as the source address	**R/U**
48.	In signed number addition, the status of which bit isimportant? a) OV b) CY c) AC d) PSW	b) CY	**R**

49.	LCALL instruction takes how many bytes? a) 2 bytes b) 4 bytes c) 3 bytes d) 1 bytes	b) 4 bytes	**R**

50.	Are PUSH and POP instructions are a type of CALL instructions? a) no b) yes c) none of the above d) can't be determined	b) yes	**R/U**

Chapter No. 4

Subjective Questions

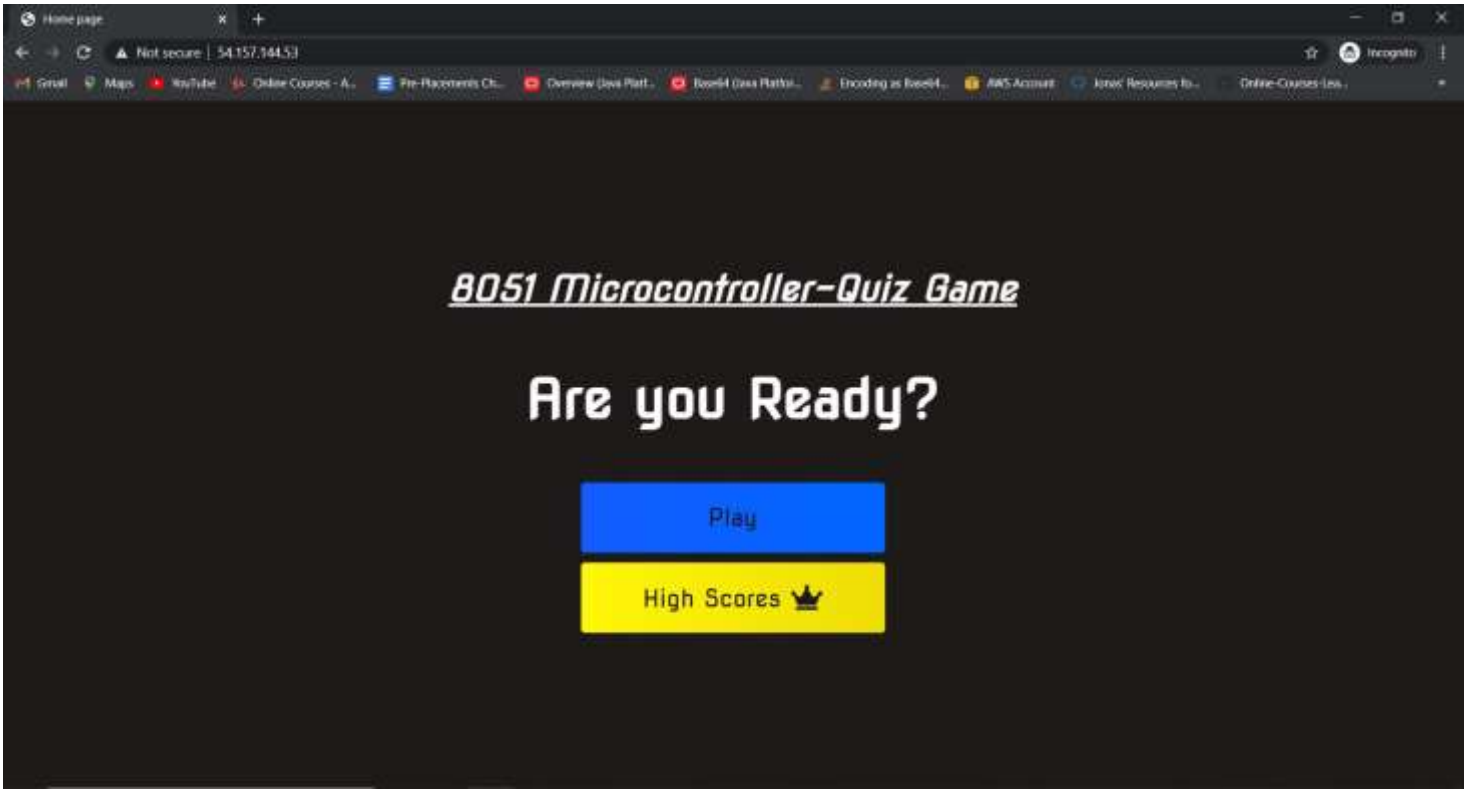
Sr. No	Question with options	Cognitive Level
1.	**Intel 8051 follows which architecture?**	R/U
2.	*8051 was developed using which technology?*	R
3.	*Why 8051 is called an 8-bit microcontroller?*	R
4.	*What is the width of the data bus?*	U
5.	*What is the width of the address bus?*	R
6.	*List the features of the 8051 microcontrollers?*	U
7.	*What location code memory space and data memory space begins?*	R/U
8.	*How Much on-chip RAM is available?*	R/U
9.	*List out addressing Modes in MCS-51.*	R/U/An
10.	*How much total external data memory that can be interfaced to the 8051?*	R/U/An

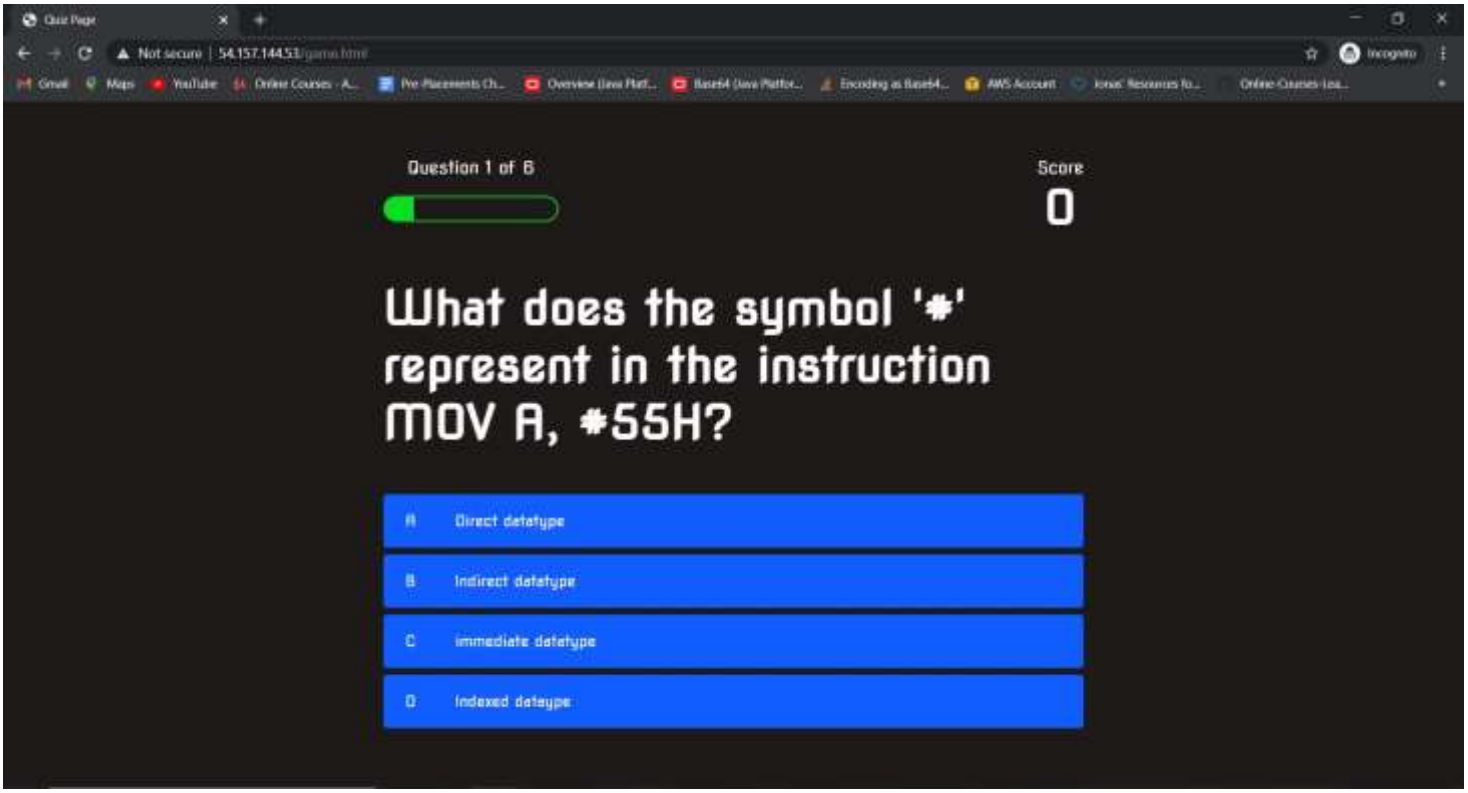
11.	What are Special Function Registers (SFR)?	U
12.	*What are the difference between bit addressable and byte address in microcontroller 8051?*	R/U
13.	*What are the types of interrupts in 8051?*	R/U
14.	What are the four distinct types of memory in 8051?	R/U
15.	*What is a .lst file?*	U/A/An/C
16.	*Explain DB.*	R
17.	*What is EQU?*	U
18.	*How are labels named in assembly language?*	U

19.	*Are all the bits of flag register used in 8051?*	R
20.	*Which bit of the flag register is set when output overflows to the sign bit?*	U
21.	*What are the issues related to stack and bank 1?*	U
22.	*Which 2 ports combine to form the 16-bit address for external memory access?*	An
23.	Can a single bit of a port be accessed in 8051?	An
24.	*Internal RAM is located from address 0x00 to____?*	R
25	*Explain JNC*	R

Chapter No. 5

Result


Home page
Not secure | 54.157.144.53
Incognito
8051 Microcontroller-Quiz Game
Are you Ready?
Play
High Scores


Quiz Page
Not secure | 54.157.144.53/game.html
Incognito
Question 1 of 6
Score
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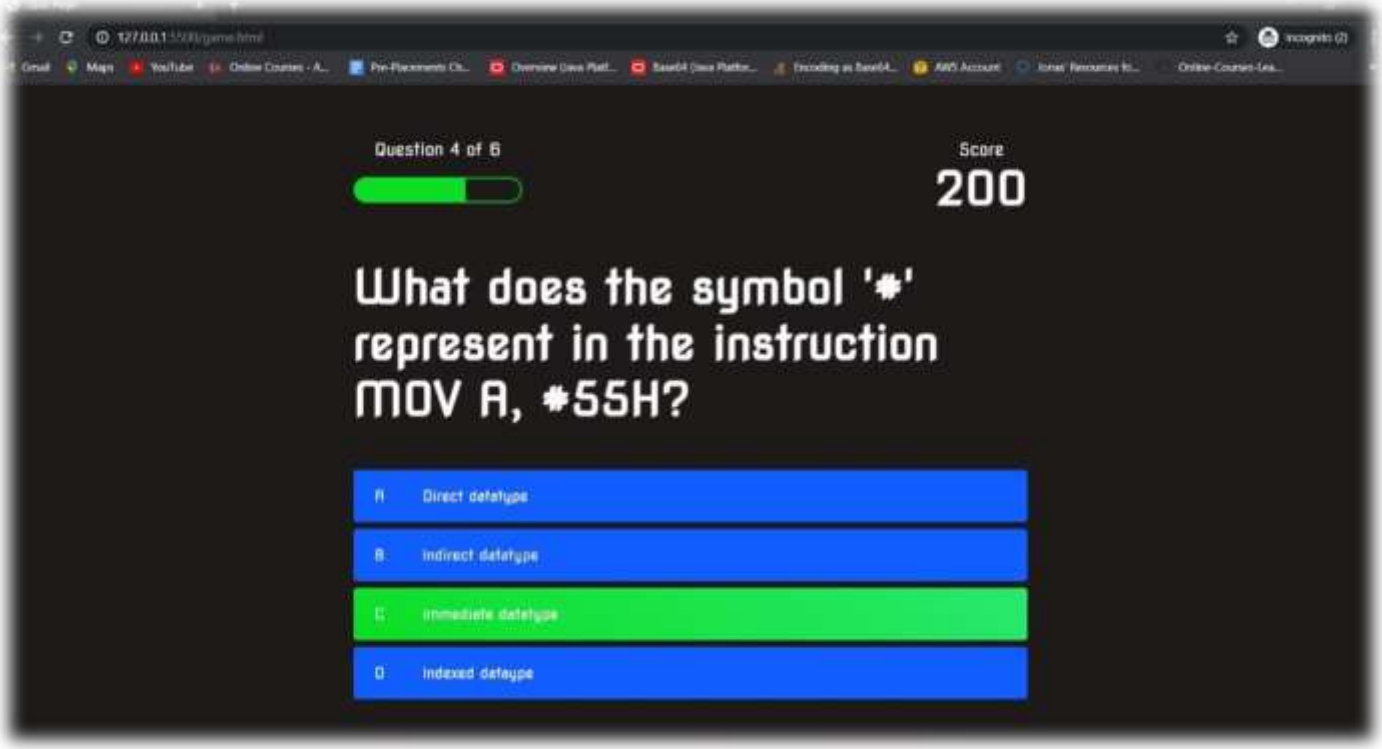
What does the symbol '#' represent in the instruction MOV A, #55H?
A Direct datatype
B Indirect datatype
C immediate datatype
D Indexed datatype


Question 4 of 6
Score
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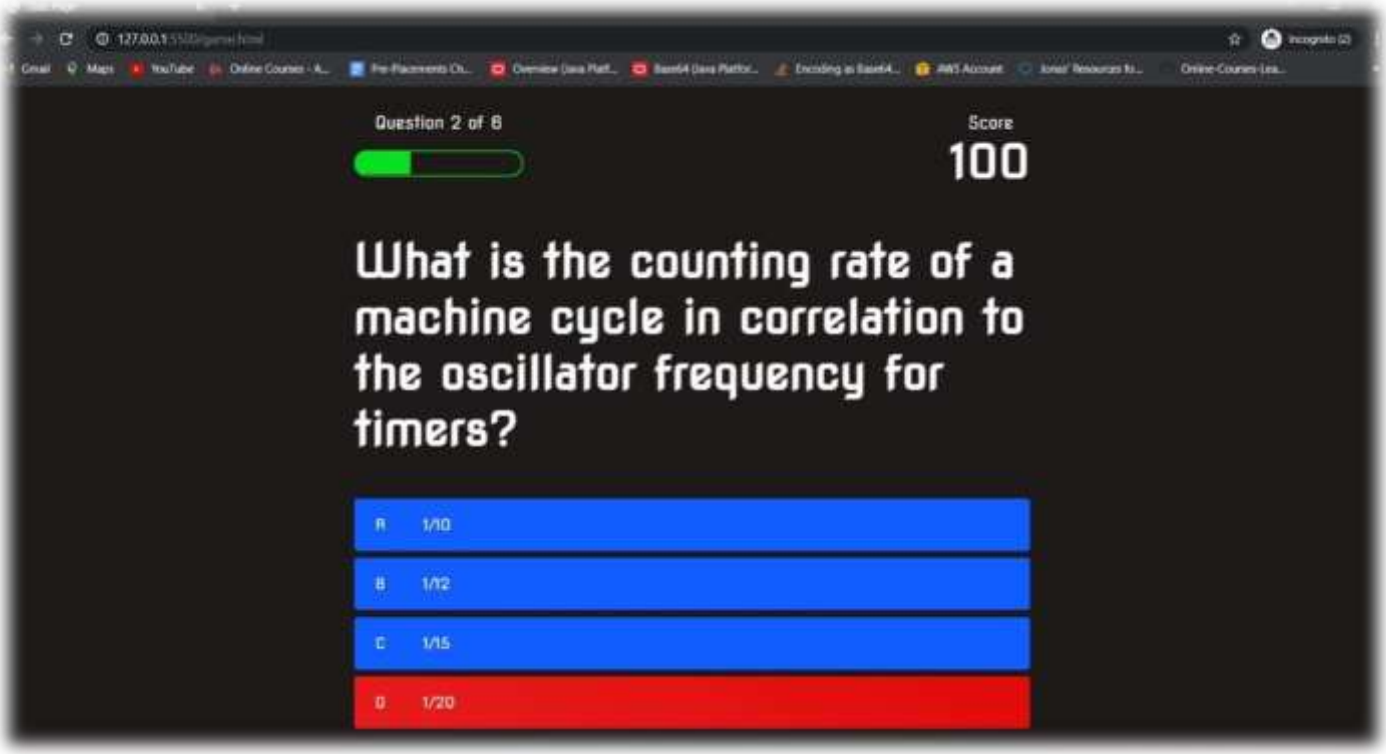
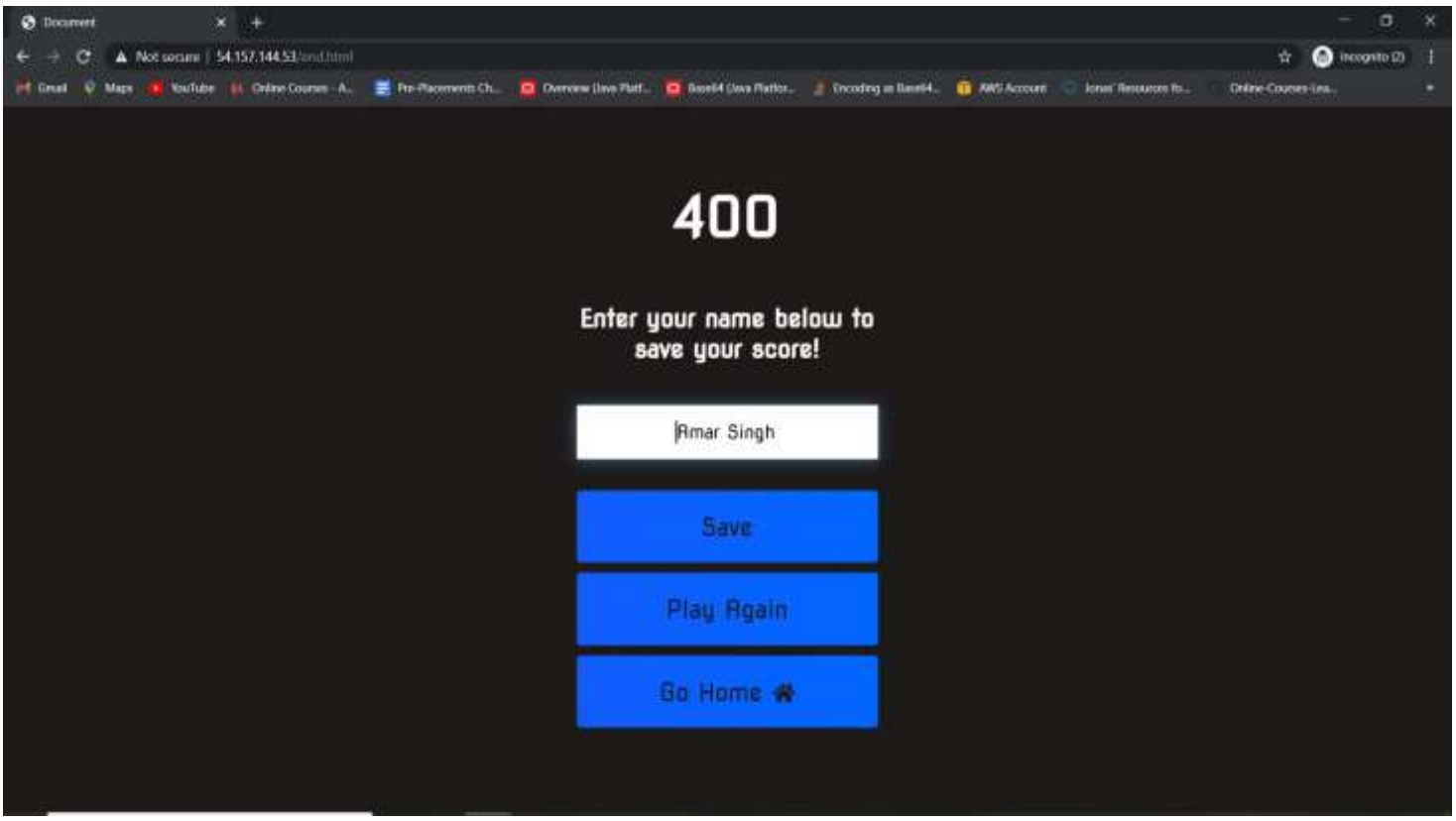
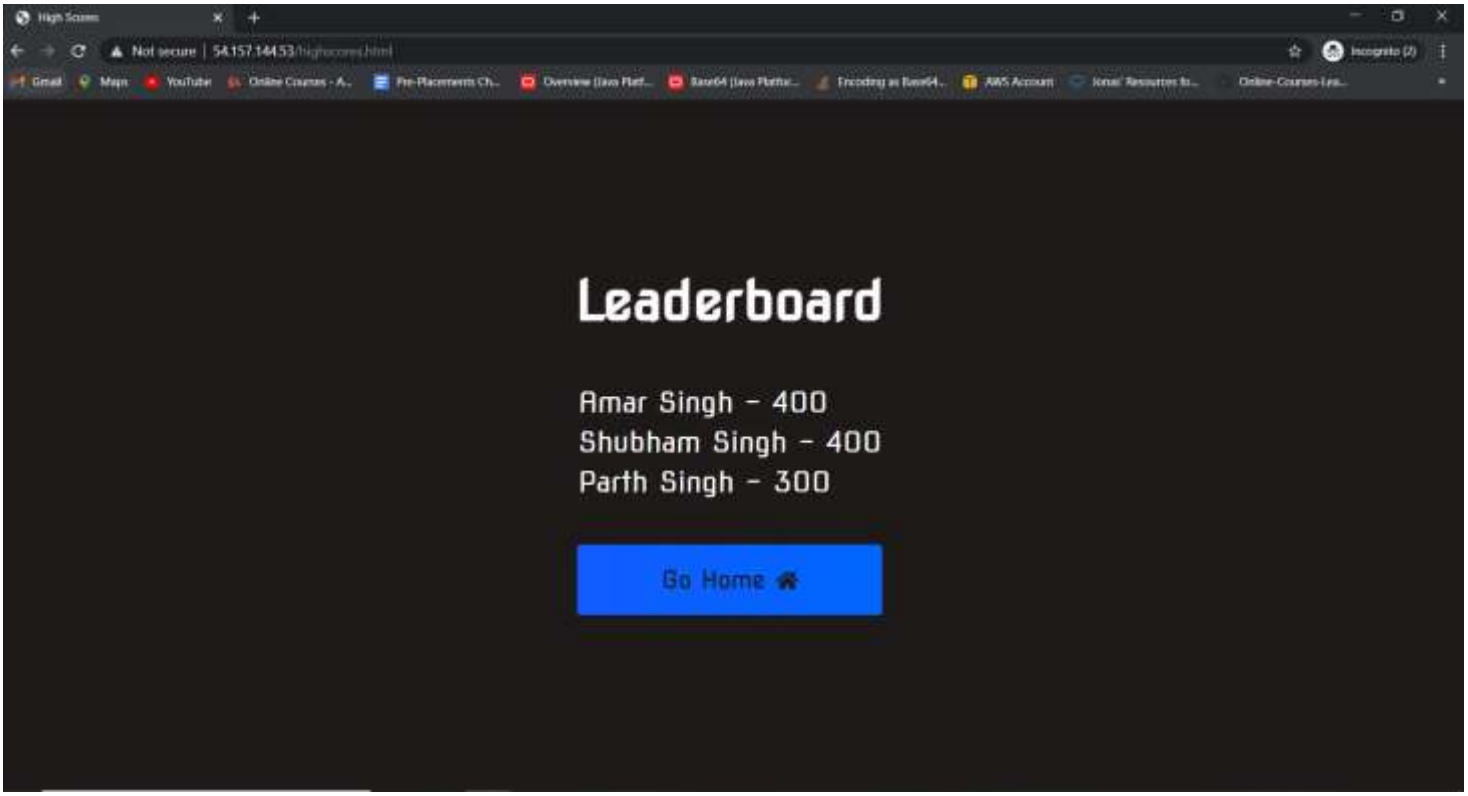
What does the symbol '#' represent in the instruction MOV A, #55H?
A Direct datatype
B Indirect datatype
C Immediate datatype
D Indexed datatype


Question 2 of 6
Score
100
What is the counting rate of a machine cycle in correlation to the oscillator frequency for timers?
A 1/10
B 1/12
C 1/15
D 1/20


Document
Not secure | 54.157.144.53/end.html
400
Enter your name below to save your score!
Amar Singh
Save
Play Again
Go Home


High Scores
Not secure | 54.157.144.53/highscores.html
Leaderboard
Amar Singh - 400
Shubham Singh - 400
Parth Singh - 300
Go Home

Chapter No. 6

Future Scope

6.1 Future Scope

- Depending on the level the user selects, the layout of the game can be changed. For e.g. instead of a quiz, a crossword or memory cards can be inculcated
- Along with the score of the quiz, users can also be provided with the solutions of the questions asked in that particular level.
- Links to learning resources can also be provided.
- Questions of the levels can further be divided according to different topics of the module.
- Competition can be encouraged among the players by recording the number of attempts and games played by a user and displaying a monthly leaderboard for the same.
- The concept of multiplayer game can also be included.
- Hints can be provided on the condition of deducting marks
- Security should be increased restricting the players to use online internet resources while playing the game.
- Time constraint provided to attempt a question can be changed as per the difficulty level.
- Non-MCQ based questions can also be included.
- Feedback can be taken using email id or a survey form in order to improve the game further.

Chapter No. 7

Conclusion

Conclusion

A quiz game to test the knowledge of basics of 8051Microcontroller is implemented for making learning interesting while also increasing the competitiveness among students. Considering that It is becoming a trend among learners and developers, the importance of having the knowledge of 8051Microcontroller is understood well. In addition to lectures, written theory, online videos and more, the competence among students is fuelled by introducing them to a game-based learning concept.

The game implemented provides the user with proper instructions prior to letting them play. The interface is easy to understand and use. The graphical user interface is clean and interesting to as to create a positive mindset among the students. The questions are short and tricky that challenge the player and motivate them to find out answers in a stipulated period of time.

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