UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPMENT OF ELECTRONIC-BASED EDUCATIONAL TRAINER KIT FOR HUFFMAN CODING DESIGN CONCEPT USING ARDUINO AND MIT APPS

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Electronic Engineering Technology (Telecommunication) with Honours.

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APPROVAL

This report is submitted to the Faculty of Electrical and Electronic Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Electronic Engineering Technology (Telecommunication) with Honours. The member of the supervisory is as follow:

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ABSTRAK

Huffman Coding adalah salah satu mata pelajaran yang dikaji dalam bidang Kejuruteraan Elektronik. Kit ini dibangunkan dengan menggunakan Arduino untuk membantu pelajar meningkatkan pengetahuan mereka mengenai "Huffman Coding". Di samping itu, tujuan kit ini adalah untuk membantu pelajar memahami lebih mendalam mengenai bentuk "Huffman Coding" bukan sahaja dari segi teori malahan dalam aspek praktikal juga. Terdapat 10 soalan yang perlu pelajar selesaikan dengan membuat penyambungan pada kit ini. Aplikasi MIT Apps dibina yang perlu pelajar menyambungkan kepada Bluetooth. Sekiranya jawapannya betul, MIT Apps Inventor akan mengeluarkan paparan 'Tahniah anda betul' pada telefon pintar dan LED akan menyala pada simbol tanda betul. Sementara itu, LED akan menyala pada simbol pangkah dan MIT Apps Inventor akan mengeluarkan paparan 'Anda Salah' pada telefon pintar jika pelajar gagal menjawab soalan tersebut. Kaji selidik dijalankan bagi 50 responden untuk mendapatkan maklum balas dan melihat daya maju sesebuah kit pendidikan yang diinovasikan untuk masa depan mereka dalam era revolusi ini.

ABSTRACT

Huffman Coding is one of the subjects studied in Electronics Engineering. This kit was developed by using Arduino to help students improve their knowledge of Huffman Coding. In addition the purpose of this kit is to help students more comprehension regarding of this Huffman Coding not only in theory but also in practical aspect as well. There are 10 questions students need to solve by connecting to the trainer kit. MIT Apps are built that require students to connect via Bluetooth. If the answer is correct, Apps will display 'Congratulations you are correct' on the smartphone and the LED will light up at the tick sign. Meanwhile, the LED will light up and the crossbar symbol and Apps will display 'You are wrong' on the smartphone when the student fail to answer the question. A survey was conducted for 50 respondents to obtain feedback and see the viability of an educational kit designed for their future in this era of revolution.

DEDICATION

To all those who have supported, encouraged, guided, love and inspired me to complete this project especially to my beloved parents, sibling, honourable supervisor, co-supervisor and friends and which has made it possible to make it up to this point.

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LIST OF SYMBOLS

%	-	Percentage
R	-	Resistor
kΩ	-	Kiloohm
µ	-	Micro
cm	-	Centimetre
nm	-	Nanometre
m	-	Metre

LIST OF ABBREVIATIONS

PC	Personal Computer
LED	Light Emitting Diode
MIT	Massachusetts institute of Technology
IEEE	Institute of Electrical and Electronics
MCU	Microcontroller Unit
PCB	Printed Circuit Board
LCD	Liquid Crystal Display
VDR	Voltage Divider Rule
EQB	Educational Quiz Board
DC	Direct Current
TFT	Thin-Film-Transistor
OpAmp	Operational Amplifier
PLC	Programmable Logic Controller
WFD	World Federation of the Deaf
LabVIEW	Laboratory Virtual Instrument Engineering Workbench
GUI	Graphical User Interface
API	Application Programming Interface
ASCII	American Standard Code for Information Interchange