

BLUETOOTH and WIFI-ENABLED PANIC BUTTON for POTENTIAL RAPE VICTIMS

Participated in & did the coursework [Y/N]?

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1 CONSPECTUS

1.1 What are the objectives of the coursework?

- 1) To assess any Digital Communications Technology (DCT) to be used in marginalized sector.
- 2) To modify the DCT appropriate to the selected marginalized sector.
- 3) To appraise the economic, societal, and environmental implications of the modified DCT.

1.2 How does the coursework fit with the course and previously done coursework?

By:

- 1) Involving the modification of a communication platform between potential rape victims and emergency contacts
- 2) Using digital communications theory to enhance performance of data transmission for the protection of app users.

1.3 How were the objectives achieved?

By:

- 1) Targeting the marginalized sector of the DCT which are potential rape victims.
- 2) Modifying the multiple access method used by bluetooth from FH-CDMA to TDMA

1.4 What are the key results and generalizations?

The key results are:

- 1) To help the master (rape victim) in a Piconet maintain more than one connection simultaneously.

By affixing my/our signature/s, I/we, the author/s, pledge that: I/we have completed this coursework on my/our own; I/we have not used any unauthorized material/assistance/help on this coursework; and I/we have not given directly or indirectly to any other student/unauthorized person/means any access to any part of the specified coursework. Coram Deo.

Coursework Starting Date: July 13, 2018
 Submission Date: August 18, 2018

2 CONCEPTS AND PRINCIPLES

2.1 What are the necessary and relevant concepts and principles for understanding the coursework and for supporting the correct results?

- 1) Mastery of how Bluetooth works and its specifications
- 2) Knowledge about different techniques used in Multiplexing methods
- 3) Clear understanding of Frequency Hopping Spread Spectrum (FHSS)
- 4) Basic concepts about bluetooth connections

2.2 How does any new component, not covered in previous coursework, function?

By:

- 1) Overlaying Time Division Multiplexing (TDM) on bluetooth connections.
- 2) Incorporating frequency hopping with TDM for simultaneous data transmission
- 3) Synchronizing a master device with the other two devices through the use of frequency hopping.

2.3 What figures, equations, and/or tables could support your answers in Sec. 2.1 and Sec.2.2?

- 1) Up to two lines per item. Figure ... shows ...
- 2) Up to two lines per item. Table ... shows ...

2.4 Did you cite more than two publications in your answers in Sec. 2.1. and 2.2

No.

2.5 Did you cite any online source in your answers in Sec.2.1 and Sec.2.2?

No.

3 METHODOLOGY

3.1 How does your implementation in Sec. 3.5 achieve the objectives?

By:

- 1) Up to two lines per item.
- 2) Up to two lines per item.

3.2 Why does your implementation in Sec. 3.5 achieve the objectives?

Because:

- 1) Up to two lines per item.
- 2) Up to two lines per item.

3.3 How does your evaluation in Sec. 3.6 achieve the objectives?

By:

- 1) Up to two lines per item.
- 2) Up to two lines per item.

3.4 Why does your evaluation in Sec. 3.6 achieve the objectives?

Because:

- 1) Up to two lines per item.
- 2) Up to two lines per item.

3.5 Implementation

Rule of thumb: Implementation is how you made your work; (keywords: implemented, created, made, soldered, programmed, etc.).

3.5.1 What were the materials used?

If the presentation would be better and necessary, tabulate your answers here instead of enumeration.

- 1) Up to two lines per item.
- 2) Up to two lines per item.

3.5.2 What is the summary of the processes used to make the coursework?

If you wrote a program or made a simulation, you must add statements how the program or simulation functions in this section. A pseudocode as shown in Table 1 is a good example.

- 1) Up to two lines per item.
- 2) Up to two lines per item.

3.6 Evaluation

Rule of thumb: Evaluation is how you tested your work for correctness; (keywords: measured, tested, compared, simulated, etc.).

3.6.1 What were your procedures for evaluating the correct outcome of your coursework?

- 1) Up to two lines per item.
- 2) Up to two lines per item.

3.6.2 What quantities were gathered and how have you obtained them for testing the veracity of your results?

- 1) Up to two lines per item.
- 2) Up to two lines per item.

4 RESULTS AND DISCUSSIONS

4.1 How do the results achieve the objectives?

By:

- 1) Up to two lines per item.
- 2) Up to two lines per item.

4.2 Why do the results achieve the objectives?

Because:

- 1) Up to two lines per item.
- 2) Up to two lines per item.

4.3 Are all your results correct in accordance to what you described in Sec. 3.6 evaluation process? Why?

Yes/no, because:

- 1) Up to two lines per item.
- 2) Up to two lines per item.

4.4 What is result X (briefly describe it here), what does it mean if it is correct, and how does it contribute in reaching the objectives?

- 1) Refer to the appropriate caption number of your result, i.e. Fig. X for figure X , Table X for table X , etc.
- 2) Interpret result X and the reasons why it was obtained.
- 3) Point out and explain apparent discrepancies from principles/concepts/theory if your result is incorrect.
- 4) Cite existing publication for comparison of your result.

Table 1
Pseudocode for the calculation of $y = x^n$

Input(s):	
n	: n th power; $n \in \mathbb{Z}^+$
x	: base value; $x \in \mathbb{R}^+$
Output(s):	
y	: result; $y \in \mathbb{R}^+$

Require: $n \geq 0 \vee x \neq 0$

Ensure: $y = x^n$

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1:  $y \leftarrow 1$ 
2: if  $n < 0$  then
3:    $X \leftarrow 1/x$ 
4:    $N \leftarrow -n$ 
5: else
6:    $X \leftarrow x$ 
7:    $N \leftarrow n$ 
8: end if
9: while  $N \neq 0$  do
10:  if  $N$  is even then
11:     $X \leftarrow X \times X$ 
12:     $N \leftarrow N/2$ 
13:  else  $\{N$  is odd $\}$ 
14:     $y \leftarrow y \times X$ 
15:     $N \leftarrow N - 1$ 
16:  end if
17: end while
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- 5) Do not present your result as “It worked” without an appropriate explanation as such action does not show thorough understanding.
- 6) Repeat Sec. 4.4 for each major result X (i.e. $X=1$, $X=2$, etc.).

For example, result $X = 1$ (on the accuracy performance of the enhanced bi-directive method):

- 1) Figure ... shows that the performance of the system is satisfactory up to 90%.
- 2) The result in Figure ... was obtained because of the bi-directive mechanism of the proposed architecture.
- 3) The remaining 10% accuracy loss is due to the failure of the bi-directive mechanism to ... and supported by
- 4) Reference [1] also achieved similar range of results from 85% to 93%.
- 5) ...

4.5 Did you cite more than two publications in your answers above (yes/no)?

Yes.

5 CONCLUSIONS

5.1 What are the main points that should be known, remembered, and learned about the coursework?

- 1) Up to two lines per item.
- 2) Up to two lines per item.

5.2 What are the gists of the inferences drawn from your results?

- 1) Up to two lines per item.
- 2) Up to two lines per item.

5.3 Briefly, what are your comments on (1) your results, and (2) future coursework if any?

- 1) Up to two lines per item.
- 2) Up to two lines per item.

REFERENCES

- [1] A. Einstein, “Zur Elektrodynamik bewegter Körper. (German) [On the electrodynamics of moving bodies],” *Annalen der Physik*, vol. 322, no. 10, pp. 891–921, 1905.
- [2] T. Oetiker, H. Partl, I. Hyna, and E. Schlegl, *The Not So Short Introduction to L^AT_EX Or L^AT_EX₂ε in 157 minutes*. n.a., 2015.
- [3] M. Shell, “How to use the IEEEtran LaTeX class. 2015.”
- [4] IEEE, “Preparation of Papers for IEEE Trans. J. (December 2013).”
- [5] ISO, “80000-2,” *Quantities and units—Part 2: Mathematical signs and symbols to be used in the natural sciences and technology*, 2009.
- [6] A. Tanenbaum, *Computer Networks*. Prentice Hall Professional Technical Reference, 4th ed., 2002.
- [7] S. Lumb, S. Lumb, and V. Prasad, “Laser-induced excitation and ionization of a confined hydrogen atom in an exponential-cosine-screened coulomb potential,” *Physical Review A*, vol. 90, no. 3, p. 032505, 2014.

GRADING RUBRIC FOR THE PROJECT

CRITERIA	EXEMPLARY 4 (Exceeds Expectations) (all checked boxes → exemplary)	SATISFAC- TORY 3 (Meets Expectations)	DEVELO- PING 2 (Below Expectations)	BEGIN- NING 1 (Not Acceptable)	RATING
Concrete understanding	<input type="checkbox"/> 1. Are key points that should be known, remembered, and learned about the coursework correct? <input type="checkbox"/> 2. Is the gist of the inferences drawn from the results accurate? <input type="checkbox"/> 3. Are the necessary and relevant concepts and principles for understanding the coursework and for supporting the correct results accurate and structured with logical reasoning? <input type="checkbox"/> 4. Does the coursework show that it is (or are the answers) on target with sound rationale, backed by strong comprehension, and defended well?	More than half of the exemplary checklist has been met	Half of the exemplary checklist has been met	Less than half of exemplary checklist has been met	_____
Articulateness in communications	<input type="checkbox"/> 1. Does the coursework show that it has not committed plagiarism? <input type="checkbox"/> 2. Is the presentation of information logically structured, mutually exclusive, and/or collectively exhaustive (should it be necessary)? <input type="checkbox"/> 3. Are data, figures, tables, equations, abbreviations, and notations properly labelled and neatly presented? <input type="checkbox"/> 4. Is the report (written and/or oral) made according to suitable and/or technical standards and set format? <input type="checkbox"/> 5. Are literature or source references properly cited? <input type="checkbox"/> 6. Is there absence of verbosity?	More than half of the exemplary checklist has been met	Half of the exemplary checklist has been met	Less than half of exemplary checklist has been met	_____
Competence in applying principles	<input type="checkbox"/> 1. Are methods for achieving the coursework objectives properly selected? <input type="checkbox"/> 2. Is the implementation of the methods successful? <input type="checkbox"/> 3. Is the evaluation for testing the correctness of the results appropriate? <input type="checkbox"/> 4. Are the required output and deliverables met according to the set requirements? <input type="checkbox"/> 1. Do the results show evidences of all the project objectives being attained? <input type="checkbox"/> 2. Does the documentation discuss how the topic developed historically from the past until now? <input type="checkbox"/> 3. Does the documentation discuss how the topic developed technically from the past until now? <input type="checkbox"/> 4. Did the proponent(s) define their project entirety into a manageable structure? <input type="checkbox"/> 5. Did the proponent(s) sequence their project activities correctly? <input type="checkbox"/> 6. Did the proponent(s) estimated the project duration properly? <input type="checkbox"/> 7. Did the proponent(s) develop their schedule well? <input type="checkbox"/> 8. Did the proponent(s) perform schedule control? <input type="checkbox"/> 5. Are encountered problems, like source of errors, clearly identified and addressed by sharp and logical investigative and observational skills? <input type="checkbox"/> 6. Does the submitted coursework match academic honesty standards?	More than half of the exemplary checklist has been met	Half of the exemplary checklist has been met	Less than half of exemplary checklist has been met	_____
Remarks:				Grade:	= _____ / 12 = _____ %