

B.Sc. in Computer Science and Engineering Thesis

**Title of Your Thesis We Tested a Very Very Long Title to See
What Happens in This Case Then We Made it Longer and We
Can Make It Even Longer Than Longer**

Submitted by

First Thesis Student Name

201414099

Second Thesis Student Name

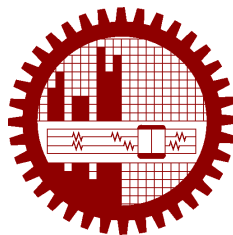
201414150

Third Thesis Student Name

201414200

Supervised by

Supervisor Name



**Department of Computer Science and Engineering
Bangladesh University of Engineering and Technology**

Dhaka, Bangladesh

February 2017

CANDIDATES' DECLARATION

This is to certify that the work presented in this thesis, titled, “Title of Your Thesis We Tested a Very Very Long Title to See What Happens in This Case Then We Made it Longer and We Can Make It Even Longer Than Longer”, is the outcome of the investigation and research carried out by us under the supervision of Supervisor Name.

It is also declared that neither this thesis nor any part thereof has been submitted anywhere else for the award of any degree, diploma or other qualifications.

First Thesis Student Name

201414099

Second Thesis Student Name

201414150

Third Thesis Student Name

201414200

CERTIFICATION

This thesis titled, “**Title of Your Thesis We Tested a Very Very Long Title to See What Happens in This Case Then We Made it Longer and We Can Make It Even Longer Than Longer**”, submitted by the group as mentioned below has been accepted as satisfactory in partial fulfillment of the requirements for the degree B.Sc. in Computer Science and Engineering in February 2017.

Group Members:

First Thesis Student Name

Second Thesis Student Name

Third Thesis Student Name

Supervisor:

Supervisor Name

Supervisor Designation

Department of Computer Science and Engineering

Bangladesh University of Engineering and Technology

ACKNOWLEDGEMENT

We are thankful to

Finally,

Dhaka

February 2017

First Thesis Student Name

Second Thesis Student Name

Third Thesis Student Name

Contents

<i>CANDIDATES' DECLARATION</i>	i
<i>CERTIFICATION</i>	ii
<i>ACKNOWLEDGEMENT</i>	iii
List of Figures	vi
List of Tables	vii
List of Algorithms	viii
<i>ABSTRACT</i>	ix
1 Introduction	1
1.1 Cross Referencing	1
1.2 How to Write a Section	1
1.3 How to Add Table and Figures	1
2 Citation Examples	4
2.1 See the Citations	4
3 Another Chapter	5
3.1 A Section	5
3.1.1 This is a Subsection	5
3.2 And Another Section	5
4 Index Creation	8
4.1 BUET	8
4.2 Campus	8
4.3 History	8
4.4 Students	9
4.5 Departments	9
5 k-safe Labeling of Petersen Graph	10

References	11
Index	14
A Algorithms	15
A.1 Sample Algorithm	15
B Codes	16
B.1 Sample Code	16
B.2 Another Sample Code	17

List of Figures

1.1 This is a sample figure.	2
--------------------------------------	---

List of Tables

1.1	Performance table of <i>Block reversal</i> in a heuristic algorithm	2
-----	---	---

List of Algorithms

1	Calculate $y = x^n$	15
---	-------------------------------	----

ABSTRACT

Write your thesis abstract here.

Chapter 1

Introduction

This chapter is for your introduction.

1.1 Cross Referencing

We have incorporated the `\cref` or `\Cref` command from `cleveref` package in this system. This will automatically insert words like Figure, Table etc. in your text.

See these examples:

- Figure 1.1 is a sample figure.
- Table 1.1 is a table.
- Section 2.1 in Chapter 2 shows some examples of citations.

1.2 How to Write a Section

This is for writing section.

1.3 How to Add Table and Figures

You should refer a figure as, “Figure 1.1 is a sample figure”.

Then we applied same test cases to our modified algorithm i.e. the heuristic algorithm with our new operation *Block Reversal*. The performance is shown in Table 1.1.

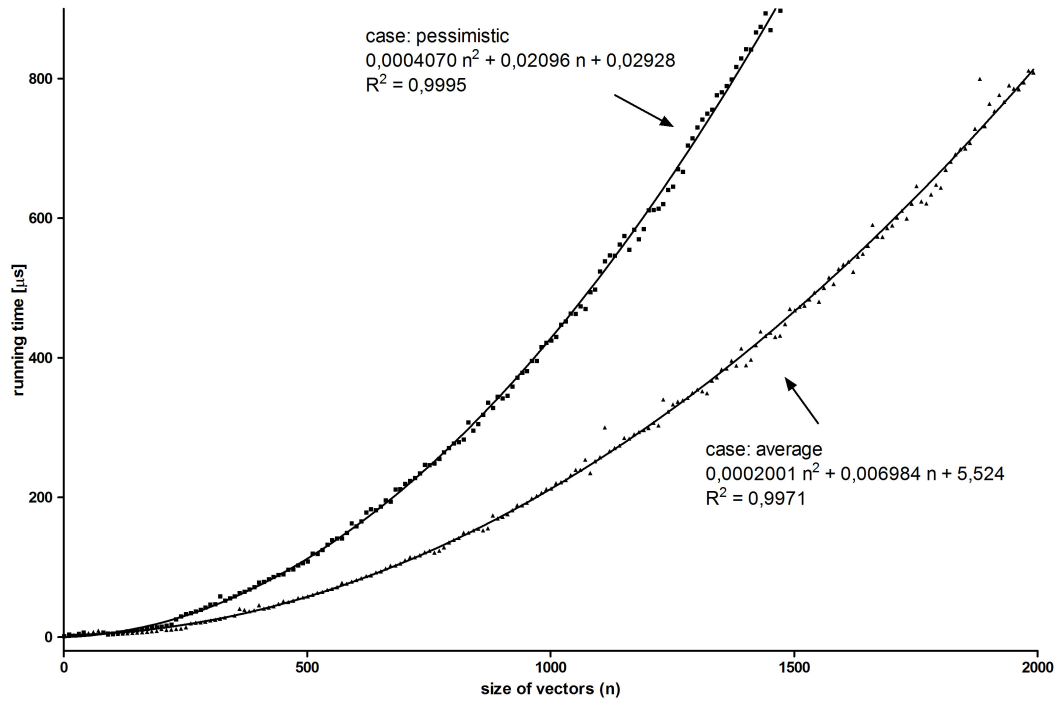


Figure 1.1: This is a sample figure.

Table 1.1: Performance table of *Block reversal* in a heuristic algorithm

α	αn	Test Cases											Average # of calculated operation
		1	2	3	4	5	6	7	8	9	10	11	
0.1	2	2	2	2	2	2	2	2	2	2	2	2	2
0.2	4	4	4	5	2	4	4	4	4	2	4	4	3.73
0.3	6	5	6	6	6	6	7	6	5	6	6	6	5.91
0.4	8	7	8	5	6	7	6	6	7	8	8	7	6.82
0.5	10	9	10	6	12	10	8	10	10	7	7	10	9
0.6	12	9	12	16	10	12	12	9	11	12	9	12	11.27
0.7	14	13	7	18	15	14	8	13	11	13	13	14	12.64
0.8	16	10	17	14	16	13	16	13	11	13	17	13	13.91
0.9	18	14	16	15	12	15	11	15	11	15	12	12	13.45
1	20	18	11	13	11	13	15	17	17	13	18	12	14.36

These are some dummy text used as page fillers only.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Cras et ultricies massa. Nulla a sapien lobortis, dignissim nibh in, aliquet mauris. Integer at dictum metus. Quisque in tortor congue ipsum ultricies tristique. Maecenas ut tortor dapibus, sagittis enim at, tincidunt massa. Ut sollicitudin sagittis ipsum, ac tincidunt quam gravida ac. Nullam quis faucibus purus. Aliquam vel pretium turpis. Aliquam a quam non ex interdum sagittis id vitae quam. Nullam sodales ligula malesuada maximus consequat. Proin a justo eget lacus vulputate maximus luctus vitae enim. Aliquam libero turpis, pharetra a tincidunt ac, pulvinar sit amet urna. Pellentesque eget

rutrum diam, in faucibus sapien. Aenean sit amet est felis. Aliquam dolor eros, porttitor quis volutpat eget, posuere a ligula. Proin id velit ac lorem finibus pellentesque.

Maecenas vitae interdum mi. Aenean commodo nisl massa, at pharetra libero cursus vitae. In hac habitasse platea dictumst. Suspendisse iaculis euismod dui, et cursus diam. Nullam euismod, est ut dapibus condimentum, lorem eros suscipit risus, sit amet hendrerit justo tortor nec lorem. Morbi et mi eget erat bibendum porta. Ut tristique ultricies commodo. Nullam iaculis ligula sed lacinia ornare.

Sed ultricies cursus nisi at vestibulum. Aenean laoreet viverra efficitur. Ut eget sapien lorem. Mauris malesuada, augue in pulvinar consectetur, ex tortor tristique ligula, sit amet faucibus metus lectus interdum nisl. Nam eget turpis vitae ligula pulvinar bibendum a ut ipsum. Mauris fringilla lacinia malesuada. Fusce id orci velit. Donec tristique rhoncus urna, a hendrerit arcu vehicula imperdiet. Integer tristique erat at gravida condimentum. Sed ornare cursus quam, eget tincidunt enim bibendum sed. Aliquam elementum ligula scelerisque leo sagittis, quis convallis elit dictum. Donec sit amet orci aliquam, ultricies sapien nec, gravida nisi. Etiam et pulvinar diam, et pellentesque arcu. Nulla interdum metus sed aliquet consequat.

Proin in mi id nulla interdum aliquet ac quis arcu. Duis blandit sapien commodo turpis hendrerit pharetra. Phasellus sit amet justo orci. Proin mattis nisl dictum viverra fringilla. Interdum et malesuada fames ac ante ipsum primis in faucibus. Curabitur facilisis euismod augue vestibulum tincidunt. Nullam nulla quam, volutpat vitae efficitur eget, porta sit amet nunc. Phasellus pharetra est eget urna ornare volutpat. Aenean ultrices, libero eget porttitor fringilla, purus tortor accumsan neque, sit amet viverra felis tortor eget justo. Nunc id metus a purus tempus euismod condimentum non lacus. Nam vitae diam aliquam, facilisis diam quis, pharetra nunc. Nulla eget vestibulum tellus, ut cursus tellus. Vestibulum euismod pellentesque sodales.

Maecenas at mi interdum, faucibus lorem sed, hendrerit nisi. In vitae augue consequat diam commodo porta sit amet eu purus. Mauris mattis condimentum feugiat. Nulla commodo molestie risus vitae maximus. Proin hendrerit neque malesuada urna laoreet convallis. Etiam a diam pulvinar, auctor sem ac, hendrerit risus. Ut urna urna, venenatis ac tellus non, scelerisque tristique ligula. Vestibulum sollicitudin vel leo malesuada accumsan. Donec sit amet erat diam. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; Vivamus odio dui, scelerisque et lorem egestas, posuere ullamcorper nunc. Integer varius nunc nec velit tincidunt commodo. Mauris rhoncus ultrices sapien non suscipit.

End of dummy text.

Chapter 2

Citation Examples

In this chapter we show how we can cite the references.

2.1 See the Citations

As discussed by authors in [1–3] we can further show how this affects us. Moreover [4–11] can be examples for the previous works. Among these [10, 12–17] are the prominent ones. Also you can take a look at [18–25].

Chapter 3

Another Chapter

3.1 A Section

Some text.

3.1.1 This is a Subsection

And some more.

This is a Subsubsection

Yet some more.

3.2 And Another Section

Here are some dummy texts.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Cras et ultricies massa. Nulla a sapien lobortis, dignissim nibh in, aliquet mauris. Integer at dictum metus. Quisque in tortor congue ipsum ultricies tristique. Maecenas ut tortor dapibus, sagittis enim at, tincidunt massa. Ut sollicitudin sagittis ipsum, ac tincidunt quam gravida ac. Nullam quis faucibus purus. Aliquam vel pretium turpis. Aliquam a quam non ex interdum sagittis id vitae quam. Nullam sodales ligula malesuada maximus consequat. Proin a justo eget lacus vulputate maximus luctus vitae enim. Aliquam libero turpis, pharetra a tincidunt ac, pulvinar sit amet urna. Pellentesque eget rutrum diam, in faucibus sapien. Aenean sit amet est felis. Aliquam dolor eros, porttitor quis volutpat eget, posuere a ligula. Proin id velit ac lorem finibus pellentesque.

Maecenas vitae interdum mi. Aenean commodo nisl massa, at pharetra libero cursus vitae. In hac habitasse platea dictumst. Suspendisse iaculis euismod dui, et cursus diam. Nullam euismod, est ut dapibus condimentum, lorem eros suscipit risus, sit amet hendrerit justo tortor nec lorem. Morbi et mi eget erat bibendum porta. Ut tristique ultricies commodo. Nullam iaculis ligula sed lacinia ornare.

Sed ultricies cursus nisi at vestibulum. Aenean laoreet viverra efficitur. Ut eget sapien lorem. Mauris malesuada, augue in pulvinar consectetur, ex tortor tristique ligula, sit amet faucibus metus lectus interdum nisl. Nam eget turpis vitae ligula pulvinar bibendum a ut ipsum. Mauris fringilla lacinia malesuada. Fusce id orci velit. Donec tristique rhoncus urna, a hendrerit arcu vehicula imperdiet. Integer tristique erat at gravida condimentum. Sed ornare cursus quam, eget tincidunt enim bibendum sed. Aliquam elementum ligula scelerisque leo sagittis, quis convallis elit dictum. Donec sit amet orci aliquam, ultricies sapien nec, gravida nisi. Etiam et pulvinar diam, et pellentesque arcu. Nulla interdum metus sed aliquet consequat.

Proin in mi id nulla interdum aliquet ac quis arcu. Duis blandit sapien commodo turpis hendrerit pharetra. Phasellus sit amet justo orci. Proin mattis nisl dictum viverra fringilla. Interdum et malesuada fames ac ante ipsum primis in faucibus. Curabitur facilisis euismod augue vestibulum tincidunt. Nullam nulla quam, volutpat vitae efficitur eget, porta sit amet nunc. Phasellus pharetra est eget urna ornare volutpat. Aenean ultrices, libero eget porttitor fringilla, purus tortor accumsan neque, sit amet viverra felis tortor eget justo. Nunc id metus a purus tempus euismod condimentum non lacus. Nam vitae diam aliquam, facilisis diam quis, pharetra nunc. Nulla eget vestibulum tellus, ut cursus tellus. Vestibulum euismod pellentesque sodales.

Maecenas at mi interdum, faucibus lorem sed, hendrerit nisi. In vitae augue consequat diam commodo porta sit amet eu purus. Mauris mattis condimentum feugiat. Nulla commodo molestie risus vitae maximus. Proin hendrerit neque malesuada urna laoreet convallis. Etiam a diam pulvinar, auctor sem ac, hendrerit risus. Ut urna urna, venenatis ac tellus non, scelerisque tristique ligula. Vestibulum sollicitudin vel leo malesuada accumsan. Donec sit amet erat diam. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; Vivamus odio dui, scelerisque et lorem egestas, posuere ullamcorper nunc. Integer varius nunc nec velit tincidunt commodo. Mauris rhoncus ultrices sapien non suscipit.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Cras et ultricies massa. Nulla a sapien lobortis, dignissim nibh in, aliquet mauris. Integer at dictum metus. Quisque in tortor congue ipsum ultricies tristique. Maecenas ut tortor dapibus, sagittis enim at, tincidunt massa. Ut sollicitudin sagittis ipsum, ac tincidunt quam gravida ac. Nullam quis faucibus purus. Aliquam vel pretium turpis. Aliquam a quam non ex interdum sagittis id vitae quam. Nullam sodales ligula malesuada maximus consequat. Proin a justo eget lacus vulputate maximus luctus vitae enim. Aliquam libero turpis, pharetra a tincidunt ac, pulvinar sit amet urna. Pellentesque eget rutrum diam, in faucibus sapien. Aenean sit amet est felis. Aliquam dolor eros, porttitor quis

volutpat eget, posuere a ligula. Proin id velit ac lorem finibus pellentesque.

Maecenas vitae interdum mi. Aenean commodo nisl massa, at pharetra libero cursus vitae. In hac habitasse platea dictumst. Suspendisse iaculis euismod dui, et cursus diam. Nullam euismod, est ut dapibus condimentum, lorem eros suscipit risus, sit amet hendrerit justo tortor nec lorem. Morbi et mi eget erat bibendum porta. Ut tristique ultricies commodo. Nullam iaculis ligula sed lacinia ornare.

Sed ultricies cursus nisi at vestibulum. Aenean laoreet viverra efficitur. Ut eget sapien lorem. Mauris malesuada, augue in pulvinar consectetur, ex tortor tristique ligula, sit amet faucibus metus lectus interdum nisl. Nam eget turpis vitae ligula pulvinar bibendum a ut ipsum. Mauris fringilla lacinia malesuada. Fusce id orci velit. Donec tristique rhoncus urna, a hendrerit arcu vehicula imperdiet. Integer tristique erat at gravida condimentum. Sed ornare cursus quam, eget tincidunt enim bibendum sed. Aliquam elementum ligula scelerisque leo sagittis, quis convallis elit dictum. Donec sit amet orci aliquam, ultricies sapien nec, gravida nisi. Etiam et pulvinar diam, et pellentesque arcu. Nulla interdum metus sed aliquet consequat.

Proin in mi id nulla interdum aliquet ac quis arcu. Duis blandit sapien commodo turpis hendrerit pharetra. Phasellus sit amet justo orci. Proin mattis nisl dictum viverra fringilla. Interdum et malesuada fames ac ante ipsum primis in faucibus. Curabitur facilisis euismod augue vestibulum tincidunt. Nullam nulla quam, volutpat vitae efficitur eget, porta sit amet nunc. Phasellus pharetra est eget urna ornare volutpat. Aenean ultrices, libero eget porttitor fringilla, purus tortor accumsan neque, sit amet viverra felis tortor eget justo. Nunc id metus a purus tempus euismod condimentum non lacus. Nam vitae diam aliquam, facilisis diam quis, pharetra nunc. Nulla eget vestibulum tellus, ut cursus tellus. Vestibulum euismod pellentesque sodales.

Maecenas at mi interdum, faucibus lorem sed, hendrerit nisi. In vitae augue consequat diam commodo porta sit amet eu purus. Mauris mattis condimentum feugiat. Nulla commodo molestie risus vitae maximus. Proin hendrerit neque malesuada urna laoreet convallis. Etiam a diam pulvinar, auctor sem ac, hendrerit risus. Ut urna urna, venenatis ac tellus non, scelerisque tristique ligula. Vestibulum sollicitudin vel leo malesuada accumsan. Donec sit amet erat diam. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; Vivamus odio dui, scelerisque et lorem egestas, posuere ullamcorper nunc. Integer varius nunc nec velit tincidunt commodo. Mauris rhoncus ultrices sapien non suscipit.

Chapter 4

Index Creation

4.1 BUET

Bangladesh University of Engineering and Technology, abbreviated as BUET, is one of the most prestigious institutions for higher studies in the country. About 5500 students are pursuing undergraduate and postgraduate studies in engineering, architecture, planning and science in this institution. At present, BUET has sixteen teaching departments under five faculties and it has three institutes. Every year the intake of undergraduate students is around 900, while the intake of graduate students in Master's and PhD programs is around 1000. A total of about five hundred teachers are teaching in these departments and institutes. There are additional teaching posts like Dr. Rashid Professor, Professor Emeritus and Supernumerary Professors.

4.2 Campus

The BUET campus is in the heart of Dhaka — the capital city of Bangladesh. It has a compact campus with halls of residence within walking distances of the academic buildings. The physical expansion of the University over the last three decades has been impressive with construction of new academic buildings, auditorium complex, halls of residence, etc.

4.3 History

BUET is the oldest institution for the study of Engineering and Architecture in Bangladesh. The history of this institution dates back to the days of Dhaka Survey School which was established at Nalgola, in Old Dhaka in 1876 to train Surveyors for the then Government of Bengal of British India. As the years passed, the Survey School became the Ahsanullah School of En-

gineering offering three-year diploma courses in Civil, Electrical and Mechanical Engineering. In recognition of the generous financial contribution from the then Nawab of Dhaka, it was named after his father Khawja Ahsanullah. It moved to its present premises in 1912. In 1947, the School was upgraded to Ahsanullah Engineering College as a Faculty of Engineering under the University of Dhaka, offering four-year bachelors courses in Civil, Electrical, Mechanical, Chemical and Metallurgical Engineering. In order to create facilities for postgraduate studies and research, Ahsanullah Engineering College was upgraded to the status of a University in 1962 and was named East Pakistan University of Engineering and Technology. After the War of Liberation in 1971, Bangladesh became an independent state and the university was renamed as the Bangladesh University of Engineering and Technology.

4.4 Students

Till today, it has produced around 25,000 graduates in different branches of engineering and architecture, and has established a good reputation all over the world for the quality of its graduates, many of whom have excelled in their profession in different parts of the globe. It was able to attract students from countries like India, Nepal, Iran, Jordan, Malaysia, Sri Lanka, Pakistan and Palestine.

4.5 Departments

Both Undergraduate and Postgraduate studies and research are now among the primary functions of the University. Eleven departments under five faculties offer Bachelor Degrees, while most of the departments and institutes offer Master's Degrees and some of the departments have Ph.D. programs. In addition to its own research programs, the university undertakes research programs sponsored by outside organizations like European Union, UNO, Commonwealth, UGC, etc. The expertise of the University teachers and the laboratory facilities of the University are also utilized to solve problems and to provide up-to-date engineering and technological knowledge to the various organizations of the country.

Chapter 5

k -safe Labeling of Petersen Graph

In 1898, Petersen produced a trivalent graph with no leaves, now called the Petersen graph [26]. In this chapter we study k -safe labeling for the Petersen graph. We also give upper bound for the span of the Petersen graph. We provide necessary proof for the upper bound.

References

- [1] M. M. Akbar, M. S. Rahman, M. Kaykobad, E. G. Manning, and G. C. Shoja, “Solving the multidimensional multiple-choice knapsack problem by constructing convex hulls,” *Computers & operations research*, vol. 33, no. 5, pp. 1259–1273, 2006.
- [2] R. Karim, M. M. Al Aziz, S. Shatabda, M. S. Rahman, M. A. K. Mia, F. Zaman, and S. Rakin, “CoMOGrad and PHOG: From computer vision to fast and accurate protein tertiary structure retrieval,” *Scientific reports*, vol. 5, 2015.
- [3] M. S. Alam, M. M. Islam, X. Yao, and K. Murase, “Diversity guided evolutionary programming: A novel approach for continuous optimization,” *Applied soft computing*, vol. 12, no. 6, pp. 1693–1707, 2012.
- [4] M. Kaykobad, “On nonnegative factorization of matrices,” *Linear Algebra and its applications*, vol. 96, pp. 27–33, 1987.
- [5] M. Kaykobad, “Positive solutions of positive linear systems,” *Linear algebra and its applications*, vol. 64, pp. 133–140, 1985.
- [6] M. Kaykobad, M. M. Islam, M. E. Amyeen, and M. M. Murshed, “3 is a more promising algorithmic parameter than 2,” *Computers & Mathematics with Applications*, vol. 36, no. 6, pp. 19–24, 1998.
- [7] “The MCNC benchmark problems for VLSI floorplanning.” Last accessed on July 21, 2014, at 02:08:00PM. [Online]. Available: <https://www.mcnc.org/>.
- [8] P.-N. Guo, T. Takahashi, C.-K. Cheng, and T. Yoshimura, “Floorplanning using a tree representation,” *Computer-Aided Design of Integrated Circuits and Systems, IEEE Transactions on*, vol. 20, no. 2, pp. 281–289, 2001.
- [9] J. Holland, *Adaptation in Natural and Artificial Systems*. University of Michigan Press, 1975.
- [10] U. Aickelin and D. Dasgupta, “Artificial immune systems,” in *Search Methodologies*, pp. 375–399, Springer, 2005.

- [11] J. R. Al-Enezi, M. F. Abbod, and S. A. Sharhan, "Artificial immune systems-models, algorithms and applications," *International Journal*, vol. 3, no. 2, 2010.
- [12] S. A. Faruque, M. A. Khatun, and M. S. Rahman, "Modelling direct marketing campaign on social networks," *International Journal of Business Information Systems*, vol. 22, no. 4, pp. 422–435, 2016.
- [13] S. Durocher, D. Mondal, and M. S. Rahman, "On graphs that are not PCGs," *Theoretical Computer Science*, vol. 571, pp. 78–87, 2015.
- [14] M. S. Rahman, A. Alatabbi, T. Athar, M. Crochemore, and M. S. Rahman, "Absent words and the (dis) similarity analysis of DNA sequences: an experimental study," *BMC research notes*, vol. 9, no. 1, p. 1, 2016.
- [15] T. Hashem, L. Kulik, and R. Zhang, "Countering overlapping rectangle privacy attack for moving kNN queries," *Information Systems*, vol. 38, no. 3, pp. 430–453, 2013.
- [16] S. M. Farhad, M. A. Nayeem, M. K. Rahman, and M. S. Rahman, "Mapping stream programs onto multicore platforms by local search and genetic algorithm," *Computer Languages, Systems & Structures*, vol. 46, pp. 182–205, 2016.
- [17] S. M. B. Malek, M. M. Sadik, and A. K. M. Rahman, "On balanced k -coverage in visual sensor networks," *Journal of Network and Computer Applications*, vol. 72, pp. 72–86, 2016.
- [18] G. M. M. Bashir, A. S. M. L. Hoque, and B. C. D. Nath, "E-learning of PHP based on the solutions of real-life problems," *Journal of Computers in Education*, vol. 3, no. 1, pp. 105–129, 2016.
- [19] M. Y. S. Uddin and R. Rafiq, "Citizen assisted environmental pollution measurement in developing cities," *International Journal of Environmental Science and Development*, vol. 5, no. 1, p. 70, 2014.
- [20] A. Kamal and M. M. Islam, "Boosting up the data hiding rate through multi cycle embedding process," *Journal of Visual Communication and Image Representation*, vol. 40, pp. 574–588, 2016.
- [21] M. E. Haque and A. K. M. Rahman, "On constructing interference-aware k -fault resistant topologies for wireless ad hoc networks," *Ad Hoc & Sensor Wireless Networks*, vol. 19, no. 1-2, pp. 67–94, 2013.
- [22] M. S. H. Mukta, M. E. Ali, and J. Mahmud, "Identifying and validating personality traits-based homophilies for an egocentric network," *Social Network Analysis and Mining*, vol. 6, no. 1, p. 74, 2016.

- [23] M. E. Ali, E. Tanin, P. Scheuermann, S. Nutanong, and L. Kulik, “Spatial consensus queries in a collaborative environment,” *ACM Transactions on Spatial Algorithms and Systems*, vol. 2, no. 1, p. 3, 2016.
- [24] M. M. Islam, M. A. Sattar, M. F. Amin, X. Yao, and K. Murase, “A new constructive algorithm for architectural and functional adaptation of artificial neural networks,” *IEEE Transactions on Systems, Man, and Cybernetics, Part B (Cybernetics)*, vol. 39, no. 6, pp. 1590–1605, 2009.
- [25] A. A. Al Islam, C. S. Hyder, H. Kabir, M. Naznin, *et al.*, “Stable sensor network (ssn): a dynamic clustering technique for maximizing stability in wireless sensor networks,” *Wireless sensor network*, vol. 2, no. 07, p. 538, 2010.
- [26] D. A. Holton and J. Sheehan, *The Petersen Graph*, vol. 7. Cambridge University Press, 1993.

Index

- 1971, *see* War of Liberation
- Ahsanullah School of Engineering, 9
- BUET, 8
 - auditorium, 8
 - History, 8
 - postgraduate, 8
 - undergraduate, 8
- Commonwealth, 9
- Dhaka, 8
- India, 9
- Iran, 9
- Jordan, 9
- Malaysia, 9
- Nalgola, 8
- Nepal, 9
- Pakistan, 9
- Palestine, 9
- Sri Lanka, 9
- UGC, 9
- War of Liberation, 9

Appendix A

Algorithms

A.1 Sample Algorithm

In Algorithm 1 we show how to calculate $y = x^n$.

Algorithm 1 Calculate $y = x^n$

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

Ensure: $y = x^n$

$y \leftarrow 1$

if $n < 0$ **then**

$X \leftarrow 1/x$

$N \leftarrow -n$

else

$X \leftarrow x$

$N \leftarrow n$

end if

while $N \neq 0$ **do**

if N is even **then**

$X \leftarrow X \times X$

$N \leftarrow N/2$

else $\{N$ is odd $\}$

$y \leftarrow y \times X$

$N \leftarrow N - 1$

end if

end while

Appendix B

Codes

B.1 Sample Code

We use this code to find out...

```
1 #include <stdio.h>
2 int Fibonacci(int);
3
4 main()
5 {
6     int n, i = 0, c;
7
8     printf("Enter_the_value_of_n:_");
9     scanf("%d",&n);
10
11     printf("\nFibonacci_series\n");
12
13     for (c = 1 ; c <= n ; c++)
14     {
15         printf("%d\n", Fibonacci(i));
16         i++;
17     }
18
19     return 0;
20 }
21
22 int Fibonacci(int n)
23 {
```

```
24  if (n == 0)
25      return 0;
26  else if (n == 1)
27      return 1;
28  else
29      return (Fibonacci(n-1) + Fibonacci(n-2));
30 }
```

B.2 Another Sample Code

```
1 SELECT associations2.object_id, associations2.term_id,
2      associations2.cat_ID, associations2.term_taxonomy_id
3 FROM (SELECT objects_tags.object_id, objects_tags.term_id,
4      wp_cb_tags2cats.cat_ID, categories.term_taxonomy_id
5 FROM (SELECT wp_term_relationships.object_id,
6      wp_term_taxonomy.term_id, wp_term_taxonomy.term_taxonomy_id
7 FROM wp_term_relationships
8 LEFT JOIN wp_term_taxonomy ON
9      wp_term_relationships.term_taxonomy_id =
10     wp_term_taxonomy.term_taxonomy_id
11 ORDER BY object_id ASC, term_id ASC)
12 AS objects_tags
13 LEFT JOIN wp_cb_tags2cats ON objects_tags.term_id =
14     wp_cb_tags2cats.tag_ID
15 LEFT JOIN (SELECT wp_term_relationships.object_id,
16     wp_term_taxonomy.term_id as cat_ID,
17     wp_term_taxonomy.term_taxonomy_id
18 FROM wp_term_relationships
19 LEFT JOIN wp_term_taxonomy ON
20     wp_term_relationships.term_taxonomy_id =
21     wp_term_taxonomy.term_taxonomy_id
22 WHERE wp_term_taxonomy.taxonomy = 'category'
23 GROUP BY object_id, cat_ID, term_taxonomy_id
24 ORDER BY object_id, cat_ID, term_taxonomy_id)
25 AS categories on wp_cb_tags2cats.cat_ID = categories.term_id
26 WHERE objects_tags.term_id = wp_cb_tags2cats.tag_ID
27 GROUP BY object_id, term_id, cat_ID, term_taxonomy_id
28 ORDER BY object_id ASC, term_id ASC, cat_ID ASC)
29 AS associations2
30 LEFT JOIN categories ON associations2.object_id =
```

```
31         categories.object_id
32 WHERE associations2.cat_ID <> categories.cat_ID
33 GROUP BY object_id, term_id, cat_ID, term_taxonomy_id
34 ORDER BY object_id, term_id, cat_ID, term_taxonomy_id
```

Generated using Undergraduate Thesis L^AT_EX Template, Version 1.3. Department of
Computer Science and Engineering, Bangladesh University of Engineering and
Technology, Dhaka, Bangladesh.

This thesis was generated on Thursday 9th February, 2017 at 6:52pm.