Proposal

For

Second Year Project

Bachelor of Science in Information Technology

DrukCode

Submitted by

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Gyalpozhing College of Information Technology

Read carefully before filling the form.

1. Please do not alter the layout of the application form. Information must be filled in the spaces provided, under set format.
2. Guidance notes in various fields should not be deleted.
3. Required information should be duly filled in the specified fields.
4. Required heads/fields which are not relevant to the project should be marked **N/A** (Not Applicable) or left blank and should not be deleted.

Guidelines and Forms

Submission Procedure

Duly filled proposal forms completed in all respects should be submitted in form of soft copy and a hard copy to project guide and project coordinator. On receipt of the applications the proposals will be evaluated by reviewer panel and proposal would then be defended by student groups. The project group may need to revise the proposal in light of the evaluator's recommendations.

For further information, please contact:

Project Coordinator

Jigme Wangmo
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Application for Second Year Project

1. Project Identification

A. Reference Number:

(for office use only)

B. Project Title: DrukCode

C. Project Internal Guide:

Name:	Sonam Wangmo		
Designation:	Lecturer		
Organization:	Gyalpozhing College Of Information Technology		
Mobile # :	17391134	Tel. # :	
Email:	sonamwangmo.gcit@rub.edu.bt		

C1. Project External Guide:

Name:	**NA**		
Designation:			
Organization:			
Mobile # :		Tel. # :	
Email:			

C2. Student Group Lead:

Name:	Sangay Khandu		
Roll No:	12190074		
Department:	Information Technology		
Mobile # :	17577699	Tel. # :	
Email:	12190074.gcit@rub.edu.bt		

D. Organizations Involved in the Project:

(Please identify all affiliated organizations collaborating in the project, and describe their role/contribution to the project.)

D1. Industrial Organizations:

#	*Organization Name*	*Role / Contribution*
	NA	

D2. Academic Organizations:

#	*Organization Name*	*Role / Contribution*

D3. Funding Organizations:

#	*Organization Name*	*Role / Contribution*
	NA	

E. Key Words:

(Please provide a maximum of 5 key words that describe the project. The key words will be incorporated in our database.)

Coding, Python, Problem solving, Rank-list, Score

F. Research and Development Theme:

Promotion of coding skills and helping GCIT students to incorporate with each other in learning coding.

G. Project Status:

(Please mark ☑)

☑ New ☐ Modification to previous Project

☐ Extension of existing project

H. Project Duration:

Expected Starting Date:	10/02/2021
Planned Duration in months:	Four month

2. Scope, Introduction and Background of the Project

A. Scope of the Project:

- To develop a mobile application for the development of coding skills in students with following features
  1. User account
  2. Rank list
  3. Point base rank
  4. Problem listed
  5. Difficulty level of question
  6. To do coding
  7. Output verification
  8. Base on python language

- Future work
  1. Online courses
  2. Project post
  3. Other programming language
  4. Discussion forum

B. Introduction (Project Background and Literature Review, Current State of the Art):

(Detailed summary of what all has been done internationally in the proposed area quoting references and bibliography. Please note that this section demonstrates the depth of knowledge of the project team and builds the confidence of the evaluators about capability of the team in achieving the stated objectives.)
(Please describe the current state of the art specific to this research topic.)

Background:

Coding, sometimes called computer programming, is how we communicate with computers. Code tells a computer what actions to take, and writing code is like creating a set of instructions. By learning to write code, you can tell computers what to do or how to behave in a much faster way. You can use this skill to make websites and apps, process data, and do lots of other cool things. It can also help you automate a spreadsheet or create new tools for your community. Learning to code makes it possible to imagine the things you want to make and actually build them.

A computer can only understand two distinct types of data: on and off. In fact, a computer is really just a collection of on/off switches (transistors). Anything that a computer can do is nothing more than a unique combination of some transistors turned on and some transistors turned off.

Binary code is the representation of these combinations as 1s and 0s, where each digit represents one transistor. Binary code is grouped into bytes, groups of 8 digits representing 8 transistors. For example, 11101001. Modern computers contain millions or even billions of transistors, which means an unimaginably large number of combinations.

But one problem arises here. To be able to write a computer program by typing out billions of 1s and 0s would require superhuman brainpower, and even then it would probably take you a lifetime or two to write. This is where programming languages come in.

Some of the International organization have websites and mobile application build to explore the knowledge of coding where other have even a platform to show their skills and computational environment to compute with world wide coders to enhance and brighten their career in coding. Kattis, HackerRank and DataCamp are some platform which provide free courses and coding platform.

Seeing the importance of coding some of the organization in Bhutan also have provided with websites to learn coding and enhance their skills in coding for brighter career in coding. “ Code for Bhutan ” has been specifically designed as a foundation course, to introduce you to many of the common coding concepts

that you'll go on to use in all major programming languages you choose to learn next. On the other hand " I Druk Solution " provides a platform to find out all that you need to know about coding for kids and get rid of all your confusion as you learn about the benefits of learning to code. It was also stated that in some of the school of Bhutan school level coding competition was held, " Coding was introduced into education curriculum for the first time this year. Since students do not have to sit for coding examinations, the Samtse Higher Secondary School conducted the first-ever school level coding competition. Dubbed hackathon, the competition is hoping to keep students encouraged to learn to code. " -BBS.

So in order to enhance the coding skills and brighten career of GCIT students in coding, DrukCode will be one of the platform for them to enhance and keep track of what they have learn in their college days where each and every individual can score points and compute with other users .

Literature Review:

" We share a variety of free coding platforms that are available for students of all ages to begin learning the coding process. Coding enhances students' problem solving by forcing students to break problems into their component pieces and reassemble them in a logical, step-by-step sequence. This promotes planning and organization skills, and it requires precision and self-discipline. Through the process, students develop independence as they troubleshoot their coding errors."

7 Apps for Teaching Children Coding Skill
These article was written by Anna Adam and Helen Mowers where they have given a brief description of coding app out of which I have selected three as following:

1. GameStar Mechanic
   Platform: Web
   Cost: $2 per student
   GameStar Mechanic teaches kids, ages 7-14, to design their own video games. Your students will love completing different self-paced quests while learning to build game levels. The site integrates critical thinking and problem-solving tasks. An app embedded within Edmodo makes logins easy for students.

2. Scratch
   Platform: Web
   Cost: Free!

Designed by MIT students and staff in 2003, Scratch is one of the first programming languages we've seen that is created specifically for 8-to-16-year-olds. Originally a multi-platform download, Scratch is now web-based and more accessible. Students use a visual programming language made up of bricks that they drag to the workspace to animate sprites. Various types of bricks trigger loops, create variables, initiate interactivity, play sounds, and more. Teaching guides, communities and other resources available on the website will help instructors get started. You don't have to be a programming expert to introduce Scratch -- we learned right along with the students!

3. Tynker

   Platform: Web

   Cost: Free

   Although Tynker is relatively new, we definitely count it as one of our favorite coding apps. The interface looks similar to Scratch. But while Scratch was designed to program, Tynker was built to teach programming. The app features starter lesson plans, classroom management tools, and an online showcase of student-created programs. Lessons are self-paced and simple for students to follow without assistance.

Similar to the application listed above some web base application coding contest for programmers are listed below

1. TopCoder

   TopCoder is one of the original platforms for competitive programming online. It provides a list of algorithmic challenges from the past that you can complete on your own directly online using their code editor. Their popular Single Round Matches are offered a few times per month at a specific time where you compete against others to solve challenges the fastest with the best score.

   The top ranked users on TopCoder are very good competitive programmers and regularly compete in programming competitions. The top ranked user maintains his own blog titled *Algorithms weekly by Petr Mitrichev* where he writes about coding competitions, algorithms, math, and more.

2. HackerRank

   HackerRank provides challenges for several different domains such as Algorithms, Mathematics, SQL, Functional Programming, AI, and more. You can solve all the challenge directly online (check out this example). They provide a discussion and leaderboard for every challenge, and most challenges come with an editorial that explains

more about the challenge and how to approach it to come up with a solution. Aside from the editorial, you cannot currently view the solutions of other users on HackerRank.

HackerRank also provides the ability for users to submit applications and apply to jobs by solving company-sponsored coding challenges.

3. LeetCode

   LeetCode is a popular Online Judge that provides a list of 190+ challenges that can help you prepare for technical job interviews. You can solve the challenges directly online in one of 9 programming languages. You are not able to view other users' solutions, but you are provided statistics for your own solutions such as how fast your code ran when compared to other users' code.

   They also have a Mock Interview section that is specifically for job interview preparation, they host their own coding contests, and they have a section for articles to help you better understand certain problems.

15 Reasons Why We Should Be Teaching Our Kids To Code

These article gives us a brief benefits and importance of coding in each and every individual's life as stated in points

- Teaches you how to thinking
- Achieve your dreams
- We need talents
- You won't be left behind
- Gives you superpowers
- Unlock creativity and open doors
- Coding is the new literacy
- Prepare for the future
- Need for diversity and multiple perspectives
- We all depend on technology
- Think about thinking
- Be creative, problem solve and learn teamwork
- Feel empowered, gain confidence
- It's a necessary 21st century skill
- Help humanity

C. Challenges:

(Please describe the challenges, specific to this research topic, currently being faced internationally.)

Compare to the mobile application the coding contest is more popular and easy to use in web applicable platform. Most user prefer and use the web applicable platform as it is convenient to use with any devise size and switch among the windows for reference. Programming language like Java have lengthy syntax where it would be difficult for java programmers to code in mobile device. So users may prefer less to user mobile device or may not prefer at all.

Challenges we could face when developing the App:

- ✓ To explore Android App development in detail.
- ✓ To integrate the app with the database.
- ✓ Designing appropriate user interface.
- ✓ Testing the system.
- ✓ Meeting the time schedule.

D. Motivation and Need:

(Please describe the motivation and need for this work.)

As being a IT students one should have basic knowledge of coding and the programming language of their own choice. In order to enhance and keep track of coding method and algorithms one will need to keep engage in coding time to time and conducing of coding contest through portable device will grow interest in user.

Hence to incorporate such need and comfort the concept of DuckCode is introduce where user can keep track of his/her action in coding, algorithms and ultimately enhance the skills of coding.

3. Aim and Objectives of the Project

(Please write the actual aim of your project. Also, describe the measurable objectives of the project and define the expected results. Use results-oriented wording with verbs such as 'to develop..', 'to implement..', 'to research..', 'to determine..', 'to identify..' The objectives should not be statements and should not include explanations and benefits. The objective should actually specify in simple words what the project team intends to achieve (something concrete and measurable/ deliverable). Fill only those objectives that are applicable to the proposed project.)

AIM : To develop python base coding contest application base on Android.

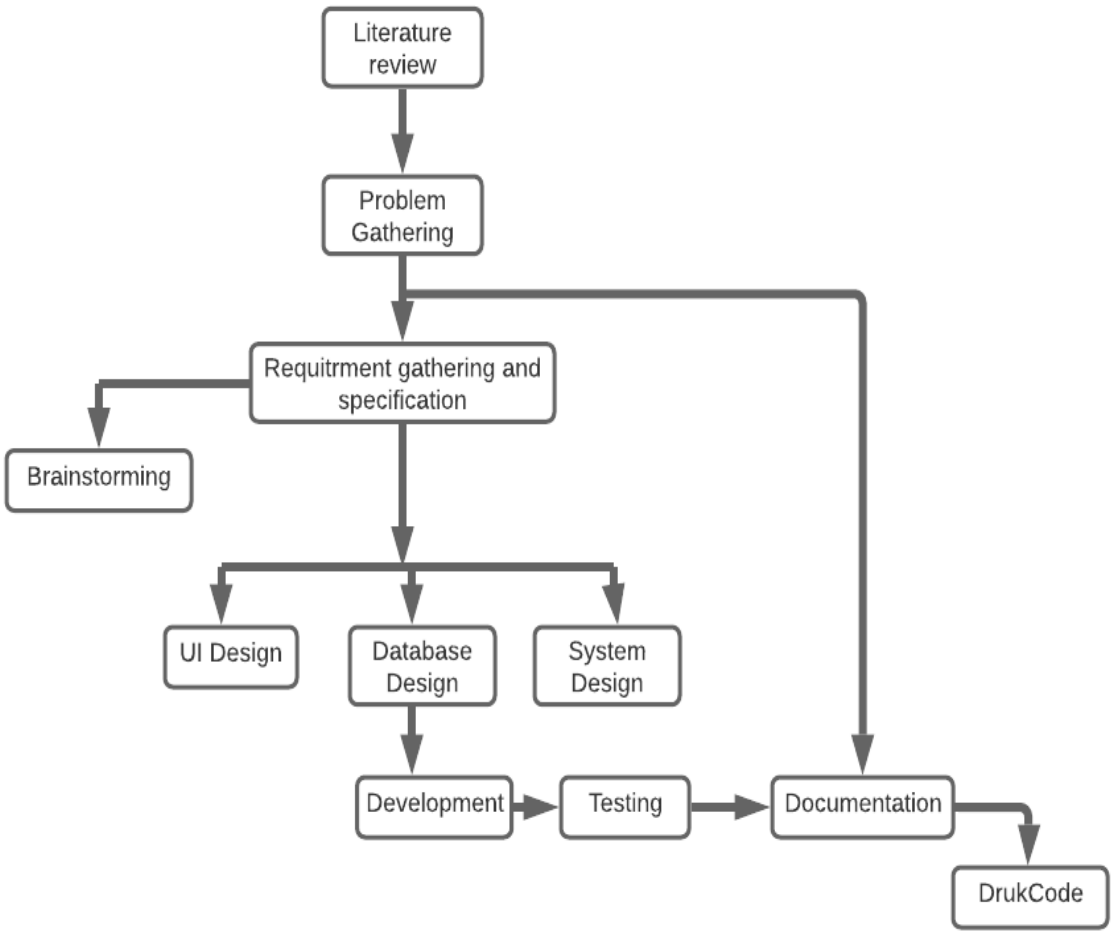
OBJECTIVES : The main objective of this project are:

- To review documents related to the topic.
- To identify different types of similar international projects.
- To identify and gather all the necessary material for the development.
- To design database for the application.
- To develop an appropriate design of the application.
- To perform unit testing.
- To launch app in google play store.

4. Methodology

A. Development / Research / Test Methodology:

(Please describe the technical details and justification of your development and research plan and test plan and testing strategies. Identify specialized equipment, facilities and infrastructure which are required for the project and their utilization plan. The block diagrams, system flow charts, high level algorithm details etc. have to be provided in this section. Also, describe the overall methodology to be used for the particular research topic)



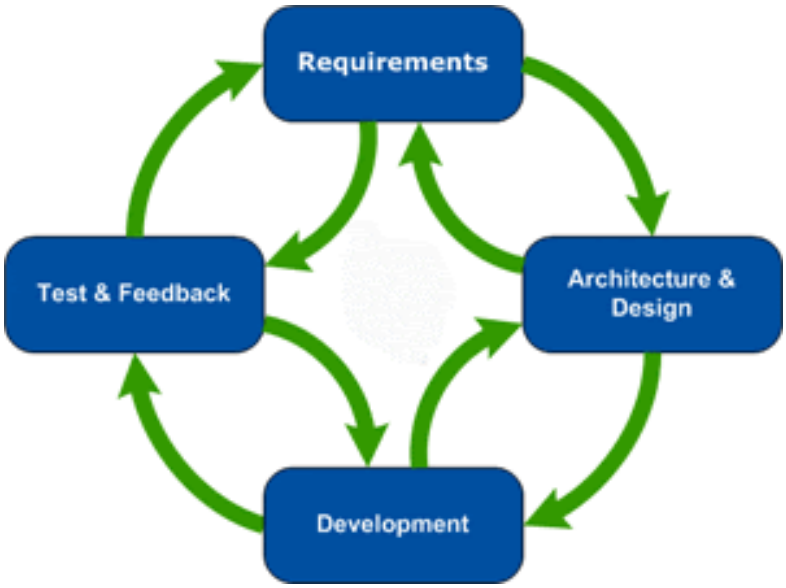
Literature review is done to help to get the clear concepts about the projects. Then study the different types of interactive systems and do comparison study to understand well about the interactive. After a comparative analysis the interactive system for our project will be derived. In the development of content the design of the database and application layout will be made. Then, the design will be converted into the code of the programming language. Testing will be done in order to fix the bugs and make the application perform better.

Problem faced by the individual user and developer will be documented as well and to keep in trace of development of DrukCode project the main problem statements will be as following:

1. How to keep track of all the coding method and algorithm?
2. How to enhancing of coding skills?
3. How effective the algorithm is?
4. How the judgment of code will be done?
5. What are the basic prerequisite to learn coding?

After the identification and gathering of requirement and specification of both data and technology , brainstorming will be done to identify any features and functionality to be added of modified. The next step will be to develop UI, database and system design and relate the working and connection of various design when integrated. Next step will be to implement the design into real code into unit wise and parallelly text the unit, integrate those unit and follow the same step. Finally after the testing of system together with the documentation of each work the product will be deployed for the feet back and final test by the users.

Development Model:



The development model use is agile software model to develop our project because of the following benefits suitable for developing a web application:

1. Errors can be detected easily
2. Missing functionality can be identified easily
3. Preview the final product

B. Project Team:	
Title / Position	***Number***
Project Internal Guide	1
Project External Guide	
Student Team Members	1
Others (please specify)	
Add more rows if required	

C. Project Activities:

(Please list and describe the main project activities, including those associated with the transfer of the research results to customers/beneficiaries. The timing and duration of research activities are to be shown in the Gantt chart in Section 8.)

The project will begin conducting a survey for feasibility study of our development and with the installation of the required software's (Android Studio and Java Development Kit v8 or more) and gathering of references (Books, tutorial documents, videos, internet, and library) related to the Android application development and XML.

The next phase of the project will consist of designing a database for the application and familiarizing the functionalities of the system which will include understanding how the control flows. The rest of the phases will include development and testing of the product under each iteration.

The development phase will be initiated following the prototyping model which will ensure low risk of project failure and greater flexibility of adjusting to the changing needs and requirements.

After the development phase, "DrukCode" application will undergo testing phase where the developed app will be integrated to check its functionalities. If any bug is encountered, the development team will solve the issues and run more tests to ensure proper functionalities of the application. The final activity will be to prepare the project report, user manual and finally conclude with the final presentation.

D. Key Milestones and Deliverables:

(Please list and describe the principal milestones and associated deliverables of the project. A key milestone is reached when a significant phase in the project is concluded, e.g. selection and simulation of algorithms, completion of architectural design and design documents, commissioning of equipment, completion of test, etc.) The timing of milestones is also to be shown in the Gantt chart in Section 8.

No.	*Elapsed time from start (in months) of the project*	*Milestone*	*Deliverables*
	-	*Commencement of the project*	
1	10/02/2021	Topic selection	Topic selection and explore on the topic related contents.
2	21/02/2021	Literature Review	Collection of data of related application, article, websites and research.
3	14/03/2021	Requirement Gathering and analysis	Requirement of software, hardware and data.
4	26/03/2021	Design	Designing of UI, database and system
5	09/04/2021	coding	Implementing the designs in coding.
6	04/05/2021	Testing	Testing of each unit, integrated and system.
7	17/05/2021	Final Documentation	Documenting of each steps and coding.

(Please add more rows if required.)

5. Benefits of the Project (Expected output/outcomes):

App developed for coding contest for GCIT students. Students will be more interested in learning and exploring coding base knowledge to compeed the coding contest. Engage student in an interactive way to reinforce what is being taught in class. The app is specifically designed to maximize engagement and keep students learning without even realizing they are.

For user

- Enhance skills in coding and algorithm making.
- Will be help full in developing analyzing power.
- Will be an easy and fun coding platform.

For developer

- Gain real time project skills.

6. Risk Analysis/Feasibility

A. Risks of the Project:

(Please describe the factors that may cause delays in, or prevent implementation of, the project as proposed above; estimate the degree of risk.)

(Please mark ☑ where applicable)	Low	Medium	High
Technical risk			☑
Timing risk			☑
Budget risk	☑		

A1. Comments(Describe the risk):

Technical risk:

- May be due to flaw in the design of the mobile app which might lead to not being able to integrate with the database.
- Other failures such as OS crash and corruption of files.

Timing risk:

- Have to spend time in doing research, designing, learning android and developing the application.
- Have to spend time in doing research, designing, learning android and developing the application.

- Difficult to manage time between study hours and project development.

Budget Risk:

- Might have to buy refreshment for the data providers.

7. Project Approval Certificate

(Approval of Project Proposal by the Competent Authority (Department Chairman) and Project Review Team is mandatory before the start of project execution.)

Project Review Team:

Sl #	Name	Signature

(Please add more rows if required.)

Project Coordinator

Name:

Designation:

Email:

Date: Signature:

Competent Authority – Head of Department

Name:

Designation:

Email:

Date: Signature

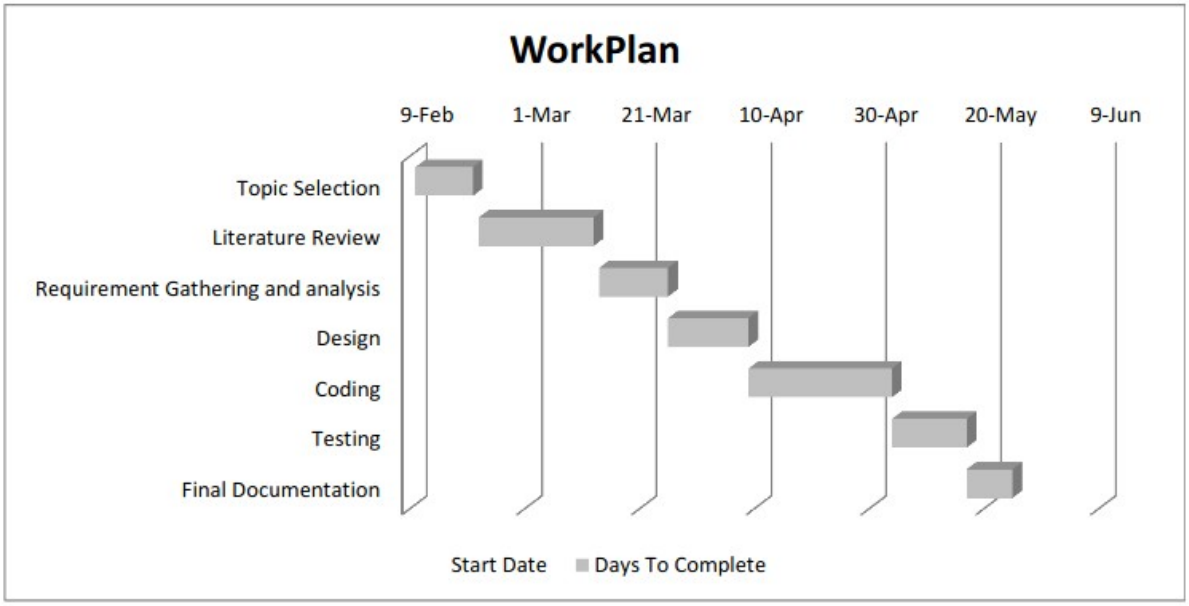
& stamp:

8. Reviewers Panel Comments

10. Project Schedule / Milestone Chart /Work plan

(Project schedule using MS-Project (or similar tools) with all tasks, deliverables, milestones, clearly indicated are preferred. Task should be measured in terms of hours)

Activities	Start Date	Days To Complete	End Start
Topic Selection	10-Feb	10	20-Feb
Literature Review	21-Feb	20	13-Mar
Requirement Gathering and analysis	14-Mar	12	25-Mar
Design	26-Mar	14	8-Apr
Coding	9-Apr	25	3-May
Testing	4-May	13	16-May
Final Documentation	17-May	8	24-May



13. Report Writing Guidelines

(Project report will be written under the specified guidelines.)

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