CSIT321 PROJECT DESCRIPTIONS
JAN 2020 – JUNE2020

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Project ID	**CSIT-20-S1-01**
Proposed Title	**Crowdfunding for Children Battling Cancer**
Project Description	This project is to develop an online fundraising & crowdfunding platform to fundraise or donate for children battling cancer. The platform should include the following functions. 1. Create a campaign Campaign organizers can create a fundraising campaign quickly and easily by telling the story and causes to support with text, photos, and videos. The organisers get notified each time someone donates and see how close they are to reaching the goal. The organisers can also send personalized thank you notes to supporters and transfer funds to their bank accounts or send them to someone else. 2. Share a campaign A campaign can be shared on Facebook, Instagram, Twitter, Email or Text message by both the organizer and the supporter. 3. Support a campaign A supporter can search for causes to support that matter to him/her and donate to campaigns directly on the platform. 4. Other functions • The user account management allows a user to create, update and close an account. • The alert function allows a user to subscribe to follow inspiring causes. • The comments function allows a user to leave comments and like others' comments. • The contact us function allows a user to ask the platform questions or report inadequate campaigns to the platform. • The system admin function The project must include a business plan to market this online platform.

Project ID	**CSIT-20-S1-02**
Proposed Title	**SIM Open House**
Project Description	Open House is an opportunity for SIM to create a marketing campaign and collect data to present to future students. This project aims to develop a professional mobile application to bring your marketing strategy to the next level. Students are required to do a proper requirements analysis by collecting requirements from both students and SIM marketing department. Based on the requirements, a mobile application is to be developed. Evaluation by students and SIM marketing department should also be part of the project. A sample application that might be helpful is called uni-verse that is used in UNSW Open Day. However, students must verify and customise the requirements and features with SIM stakeholders.

Project ID	**CSIT-20-S1-03**
Proposed Title	**Instant poll**
Project Description	Imaging you are giving a presentation, you want to ask your audience some questions and want to have accurate answers instantly. This is a good way to engage with the audience and has been used in many live TV shows. In this project, the following functions need to be provided. 1. Setup your poll in advance or on the fly. The question can be a single question (e.g., Do you like SIM?), or a multiple choice question, or a rating scale question. 2. Direct your question to audience. A timer can be set for answering the question. 3. Visualise the answer. You can visualise the answers in a format that is suitable to the questions, such as pie chart, bar chart, etc. 4. Archive the data. You can archive the data for the purpose of analysis Some optional features also need to included: 1. Allow anonymous response 2. Allow multiple response from a user 3. Allow only one response from each user

Project ID	**CSIT-20-S1-04**
Proposed Title	**SmartBike: a bicycle sharing system**
Project Description	A bicycle-sharing system, public bicycle system, or bike-share scheme, is a service in which bicycles are made available for shared use to individuals on a very short term basis. Bicycle sharing began in Europe and now is available in more than 50 countries in the world. In this project, you will bring a new competitor, SinBike, in to Singaporean market. The system should provide the following functions: 1. User management: users can register, manage own profiles, check balance and transaction history, and top up the account. 2. Bicycle search and reservation: users can search the available bicycles in a digital map. A user can reserve a bicycle online and the bicycle will be reserved for 10 minutes for the user. 3. Rental and return: A user can rent a bicycle by scanning the QR code of the bicycle. A second scan of the QR code will return the bicycle. The user's account will be charged accordingly. Mobile platform: IOS or Android

Project ID	**CSIT-20-S1-05**
Proposed Title	**Typing Habit Gesture Authentication System**
Project Description	Passwords have been the main protection system that people use to enter and use digital resources. The main idea of this project is to replace a password system with a typing gesture habit authentication system. When the system is on, the user will be asked to type a sentence that is given on the screen, and the software will determine the user based on the typing behaviour pattern.

Project ID	**CSIT-20-S1-06**
Proposed Title	**Turn-based Strategy Board Game**
Project Description	There are a variety of traditional tabletop board games, e.g., The Settlers of Catan, Risk, Monopoly, and so on. The aim of this project is for the project group to select a tabletop board game and to develop it into a digital turn-based strategy game. The digital version can be implemented in 2D, 3D or 2.5D. The game should handle multiple players and function over a network. The group is free to add new features to the game or to alter the rules of the traditional game as long as it makes sense. User interaction should be intuitive, and the system should make the game easier for the players, e.g., keeping track of score, resources, etc. The digital version should also add to the players' experience by adding sound, animation, videos, etc. Advanced features may include the ability to incorporate AI players with human players.

Project ID	**CSIT-20-S1-07**
Proposed Title	**GroupBuy (you can give it a fancy name)**
Project Description	A group buy site sells a service or item after a certain number of agreements to buy the item has reached. The business model is based on the U.S. business Groupon. This project aims at developing a mobile ecommerce application based on the concept of group buy. Each item listed in this platform has a discounted price and an associated minimum number to be reached. The shoppers can browse (and search) the items for sale in this platform. Once a shopper has the interest to buy an item, he can either add it to the watch list, or join an existing group to buy this item. The shopper can also start a new group for the item. Once a new group is created, all users who have the same item in their watch list will be notified and be invited to join the group to buy. Once the minimum group size is reached, transaction will be completed for all members in that group at the discounted price. A shopper has the option to leave group before the minimum number is reached. A group might also be dismissed after a timer expires. User account management is a standard function of this application.

Project ID	**CSIT-20-S1-08**
Proposed Title	**Carpool World**
Project Description	This application is intended for use by SIM staff and students for the sake of carpooling, with the pplication intended to act as a way to easily share rides to and from the Institute. Our key objective for the application is to allow people who need to share a car ride to the university to easily find each other and coordinae their pickup and travel time, with this in turn helping to fully utilise space in the parking area. It is envisioned that this will assist to reduce traffic congestion issues around the university at peak time periods.

Project ID	**CSIT-20-S1-09**
Proposed Title	**Gacha Game**
Project Description	Gacha games are becoming increasingly popular. The notion behind this project is to create a gacha game (must not to involve real money!) with elements of randomness that will entice players to keep playing, strengthening and collecting in-game material. There are various forms of gacha game models, the group is free to innovate around the usual models. The game itself should be interesting and fun to play. A variety of gameplay features and options can be implemented including artificial intelligence, friendlists, real-time/turn-based, 2D/2.5D/3D, etc.

Project ID	**CSIT-20-S1-10**
Proposed Title	**Polymorphic Engine**
Project Description	Polymorphic engines are used in malware to change the structure of the code from copy to copy. The aim of this project is to build a polymorphic engine. Ideally this will be assembler based.

Project ID	**CSIT-20-S1-11**
Proposed Title	**My News Headlines (can be changed by the project team)**
Project Description	This project is to develop a mobile application to assist a user in browsing vast amount of information on the Internet. The application starts with a small user profile which indicates the areas/topics that the user is interested in. The crawling component of the application will use this profile to visit a number of public websites (for example, news websites) to download contents or create indices of other sites' contents. When the selected contents are presented to the user, his reading history will be tracked to further improve the profile for more accurate crawling in the future. The contents or indices will be updated periodically or when the user restarts the application. The user can also update the contents by sliding the screen or pressing a button. The application can also send some relevant ads to the user based on his profile and reading history.

Project ID	**CSIT-20-S1-12**
Proposed Title	**Multiplayer Battle Arena for Mobile Devices**
Project Description	The goal of this project is to develop a multiplayer battle arena game for mobile devices. Players will form two teams with each player controlling a single character. Players should be able to choose from a number of characters, each with different characteristics. The two teams will fight to achieve the map objectives (e.g., destroy opposing team's base, occupy and defend territories for points, kill enemy forces). The map should also spawn AI NPCs to aid each team, AI NPCs should also take control if players disconnect from the game.

Project ID	**CSIT-20-S1-13**
Proposed Title	**First Person Puzzle Game**
Project Description	This project involves developing a puzzle game from a first person perspective. The game should involve puzzle challenges that the player has to solve by interacting with the environment and objects in the environment in a specific way. Clues can be given to aid the player in solving the puzzles. More advanced challenges may include features like completing the challenges within a certain time frame, etc.

Project ID	**CSIT-20-S1-14**
Proposed Title	**Analysing and Modelling Weather Patterns**
Project Description	The purpose of this project is to create a platform for analysing weather patterns. The weather patterns can be artificially generated randomly based on a set of parameters (e.g., rain fall, temperatures, etc.) that can be modified, or obtained from sources like climate centres. Based on the weather model, the platform should be able to perdict weather and weather events. For example, hourly temperature, days likely to rain, for how long and amount of rainfall, etc.

Project ID	**CSIT-20-S1-15**
Proposed Title	**Social Media Rumour Detection**
Project Description	There are a lot of "fake news" on social media. The aim of this project is to predict the degree at which a piece of news is likely to be genuine or a rumour. This might involve detecting usage of words and grammar, comparisons with genuine news sources, individuals on a blacklist, etc. The system should analyse results and display the data visually, e.g., demographics of individuals posting rumours, popular topics for rumours, etc.

Project ID	**CSIT-20-S1-16**
Proposed Title	**Financial Market Simulator**
Project Description	Financial markets are volatile and depend on many different factors. For example, a big world event can cause the financial market to crash, or a trade deal between two countries might stir investor confidence. The purpose of this project is to analyse financial markets data patterns in order to predict how the market will react to world events.

Project ID	**CSIT-20-S1-17**
Proposed Title	**Side Channel Analyser and Eliminator**
Project Description	Side channel attacks, such as time based attacks, are critical issues in the implementation of cryptographic algorithms. This project should allow the side channel information of some types, probably timing and perhaps other sources such as sound and power usage, to be measured. These measurements would provide a statistical baseline and if there is significant variance detected as a function of key size or key value that may correlated, the application could recommend action be taken. The application could then build a wrapper around the appropriate modules to eliminate the leaked information. Such wrappers could include the use of delays to smooth out the measured provide and make the timing independent of, for example, the specific keys being used. The group should probably initially limit attention to side channels in communication, specifically timing. It would be necessary to be able to modify the code of the analysed program and automating this probably wouldn't be easy.

Project ID	**CSIT-20-S1-18**
Proposed Title	**KECCAK Algorithm Visualiser**
Project Description	The purpose of this project is to demonstrate how the KECCAK algorithm works. The output of every single step will need to be shown step-by-step, and the user is provided with the layout of the algorithm. The main goal is to educate someone with the KECCAK algorithm, and there should not be any pre-requisite knowledge.

Project ID	**CSIT-20-S1-19**
Proposed Title	**Biometric Authentication**
Project Description	The idea is to provide a biometric authentication for a system. Its up to the group what form of biometric identifiers to use. This can range from face recognition, to voice recognition, gesture based authentication, etc. The system should produce a confidence level of whether or not the person is an authorised user.

Project ID	**CSIT-20-S1-20**
Proposed Title	**Phishing Email Detection**
Project Description	Humans are one of the weakest links in cyber security. Security can be compromised with an individual clicking on a link in an email, or replying to an email with their bank account details, etc. The aim of this project is to develop a system for automatically detecting phishing emails. This might include analysing the email address, email contents, weblink or attachment formats, etc.

Project ID	**CSIT-20-S1-21**
Proposed Title	**Smart Contracts using Blockchain**
Project Description	A smart contract enforces transactions without the need for human intervention. This project involves developing a system using blockchain technology to allow users to easily establish smart contracts between two parties. This might include setting up categories and options that a user can select from using a graphical user interface, a method of inviting the other party to negotiate the terms of the contract, etc.

Project ID	**CSIT-20-S1-22**
Proposed Title	**Traffic Prediction and Travel Planning Service**
Project Description	Data mining and machine learning have been widely applied to predict the vehicle flows in the cities. Many transport authorities (such as NSW RMS) publish traffic data which can be used to produce analytic output. This project has two work packages. The first package is to implement prediction algorithms in a big data platform (e.g. Apache Hadoop or Spark). The second part is to implement a service to plan a future travel based on the prediction result. *Expected outcome:* Source code of the project and demonstrating cases

Project ID	**CSIT-20-S1-23**
Proposed Title	**Containerisation Technology for Big Data Education**
Project Description	Big data requires "big machines" which may not be very accessible resources in university education. Usually, big data environments (such as Apache Hadoop) are deployed in stand-alone machines (e.g., desktops or VMs) in the university computer labs (which are shared by multiple subjects). This project aims to use the containerisation technology to enable the fast deployment of a Hadoop cluster in the university lab environment. *Expected outcome:* Docker images with Hadoop and other components (e.g., Hive, HBase and Spark); a deployment documentation

Project ID	**CSIT-20-S1-24**
Proposed Title	**Event Stream Virtualisation and Analytics**
Project Description	Event streams are ubiquitous. Various forms of event streams include business transactions, clickstreams and call paths. The value of those streams depends on the capability of moving and analysing the data. Nowadays more and more companies deploy streaming platforms to route the data between different components in the IT infrastructure. This project aims to implement functions that virtualise and analyse event streams in one of the leading streaming platforms such as Apache Kafka. One essential requirement is efficiency as the results should be generated with minimum delay. *Expected outcome:* source code of the project and case studies

Project ID	**CSIT-20-S1-25**
Proposed Title	**Sentient Analysis in Spark Streaming**
Project Description	In the today's world of opinions, Twitter is a popular social media which people often take to express their opinions. Due to the unregulated characteristic of "twitts", it is challenging to analyse the sentiments on topics that are worthy of attentions (e.g., social matters and political debates). This project aims to develop a software tool to analyse the sentiments of Twitter data in Spark Streaming (i.e., Spark's streaming component) based on the start-of-the-art deep learning models (e.g., RNN). *Expected outcome:* A Spark project

Project ID	**CSIT-20-S1-26**
Proposed Title	**Management of Machine Learning (ML) Workflows**
Project Description	Real-world ML pipelines usually include a number of stages. A workflow system can facilitate the design, management and monitoring of ML pipelines. This project implements a workflow system for one widely used ML library, such as TensorFlow. The workflow system should provide interfaces to compose ML models with control steps (e.g., fork and join). It should include a function to monitor the execution status of the pipeline. *Expected outcome:* Source code of the workflow system; case studies

Project ID	**CSIT-20-S1-27**
Proposed Title	**Efficient hybrid encryption for multimedia delivery**
Project Description	The idea of the project is to provide a secure broadcast server, such as Netflix, which delivers multimedia content. Ideally, it should be encrypted using a hybrid encryption, while making use of broadcasting technology. Anyone who subscribes to the system can view the contents whilst the rest cannot view it. The demonstration produced should include PCs, tablets and mobile devices to view the contents and the users can be added/revoked dynamically. *Expected outcome:* Source code of the workflow system; case studies

Project ID	**CSIT-20-S1-28**
Proposed Title	**Secure search**
Project Description	The idea of the project is conduct secure search without revealing the keyword. Unlike google search, the user will need to encrypt his/her keyword and send it to the cloud. Then the cloud can do matching in the encrypted domain, then return the result in an encrypted form. This way, the cloud will not learn what has been returned (cf. Google search).

Project ID	**CSIT-20-S1-29**
Proposed Title	**Efficient SSH tunneling**
Project Description	As we know, SSH client can provide tunnelling via different mechanisms. The idea of the project is to create a new SSH client which can efficiently do tunnelling and easily configure with the system.

Project ID	CSIT-20-S1-30
Proposed Title	**Secure workgroup collaboration**
Project Description	This project is to create a secure workgroup environment where users can exchange messages, store files (eg. Word or PPT files) to be shared with other online users, securely.

Project ID	CSIT-20-S1-31
Proposed Title	**Secure password storage**
Project Description	The project is to store passwords of various websites and make the user to conveniently remember only one password. This software must produce a plug in for Chrome/Edge so the user does not need to enter his/her password anymore, after the "single sign on" process.

Project ID	CSIT-20-S1-32
Proposed Title	**Behavioural password protection**
Project Description	The project is to propose new passwords for the users based on the "training" provided. Essentially, the idea is to allow the software to propose a combination of passwords based on what the users like to choose their own passwords. As an example, if the user likes to use multiple alphabets of his children names, then the software will provide proposals to secure those passwords without sacrificing the users' preference.

Project ID	CSIT-20-S1-33
Proposed Title	**Obfuscator for Java programming**
Project Description	The idea of this project is to construct an obfuscator for Java programming. The program will still be compilable under Java. The program should compare the efficiency of the result compared to the original source code.

Project ID	CSIT-20-S1-34
Proposed Title	**Obfuscator for Python programming**
Project Description	The idea of this project is to construct an obfuscator for python programming. The program will still be executable under Python. The program should compare the efficiency of the result compared to the original source code.

Project ID	**CSIT-20-S1-35**
Proposed Title	**Obfuscator for C++ programming**
Project Description	The idea of this project is to construct an obfuscator for C++ programming. The program will still be compilable under C++. The program should compare the efficiency of the result compared to the original source code.