



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

**SCHOOL OF COMPUTING**  
Faculty of Engineering

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**SECP1513 – TECHNOLOGY AND INFORMATION SYSTEM**

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**DESIGN THINKING:  
PROGRAMMING AND LANGUAGE**

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SECTION : 08 - 1SECR  
COURSE NAME : BACHELOR OF COMPUTER SCIENCE ( COMPUTER  
NETWORK & SECURITY )

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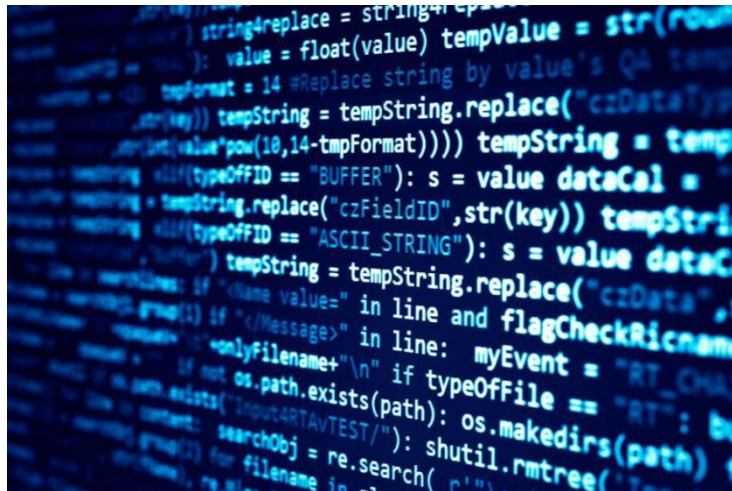
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DATE OF SUBMISSION : 20<sup>TH</sup> OCTOBER 2019

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# INTRODUCTION

In order to understand what programming is, firstly we have to understand that computer is a dumb tool use to perform lots of repetitive task,efficiently. But computer can not come up with solutions and run by



itself. On the other hand, human beings are really good at analyzing things and come up with solutions but regretfully they get easily bored with repetitive task. Thus this is where programming is being implement. Human beings, by using their analytical and problem solving skills, can think of algorithms which is a set of rules to be followed by computer in problem-solving operation in order to produce output. So programming is actually a set of instruction for the computer to perform certain tasks.

Just like us human beings that have many different languages to communicate, computer also has their own language in order for them to understand the instruction given to them and we call it Programming Language. A programming language provides a way for programmer to give instruction and express a task so it could be understood and executed by the computer. There are many programming language that used for lots of purpose for example Java, Java Script, C, C++, Python, PHP and many more.

## **DETAILED STEPS**

On September 29<sup>th</sup> 2019, we received our assignment. We were given bunch of videos related to design thinking as our guide to start. The topic that was assigned to us was 'Programming and Language'.

### **Empathize**

We chose computing students who are still learning programming technique as our targeted consumer. This is because we think that they still have a long journey in learning programming technique thus something need to be done for those who are still struggling. In order to empathize and understand their needs, we interviewed some students and listen to their problem. From the interview we did, we got the idea of the problem they individually face.

### **Define**

In this phase, we try to analyze and synthesis the help these students need in studying programming. Based on the interviewing session we did, one of the thing that's hard for them to avoid in programming is error while compiling. Other than that, for a beginner user that recently learn programming, they tend to forget the term used in programming language.

### **Ideate**

When we have a clear vision regarding our main issue, we started brainstorming the ideas on how to solve the problem faced by students. When one of us voice their idea, we try to think on how to make their idea become more compact but not complicated and still user-friendly. We list down all possible ways and later narrow it down to the best solution we could think of by evaluating our idea one by one.

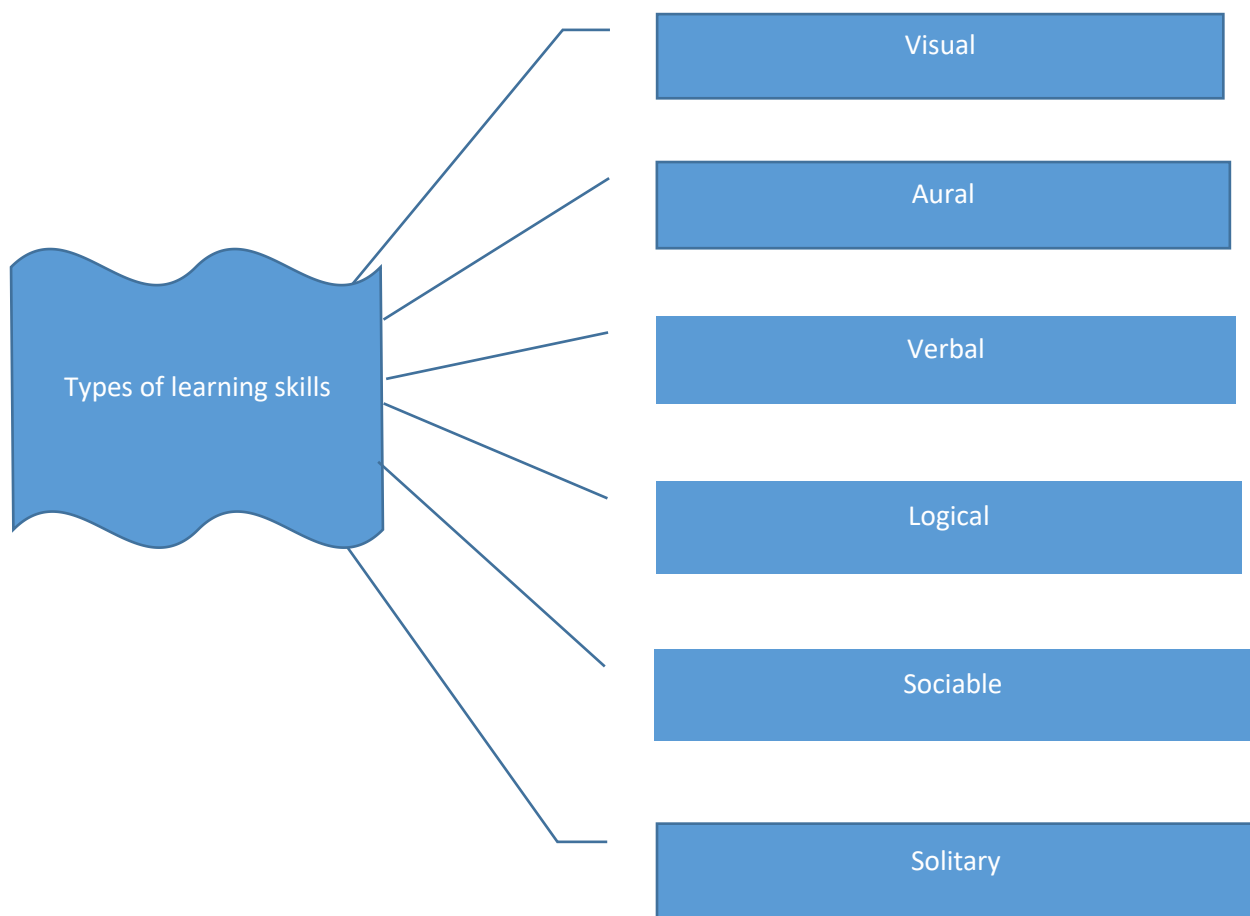
### **Prototype**

We showed our prototype to the students that we interviewed to know their views of our prototype. We had few trial and error sessions to figure out if its functioning

properly. They did said that our prototype could really help them lessen their errors and its user friendly especially for the beginner. Finally, we had created a better prototype which satisfies all the aspects that we have listed.

## **DETAILED DESCRIPTION (PROBLEM, SOLUTION AND TEAM WORKING)**

The problems that all o f us had discussed is about the different type of learning style to learn programming and some of the difficulties faced during learning programming language. There are 6 types of learning styles which are visual, aural, verbal, logical, sociable and solitary. Everyone will have their own dominant style of learning with far less use of the others styles. People who like to learn through visual are those who prefer using pictures, videos and spatial understanding while other who prefer learning through aural are those who like to use music and sound to make them be focus. People who use verbal as their dominant style of learning like to use words and those who are logical style prefer using logic, reasoning and systematic thinking. Sociable type of person likes to learn in group and interact with others while solitary person prefers to learn alone in a quiet environment.



Furthermore, programming is not an easy subject to master unless you have already experienced learning it for certain period of time. In programming there many types of computer programming languages that can be used to run a program such as Python, BASIC, Visual Basic and JavaScript. Students face problems and difficulties as they change their programming language, for example a student was learning to use JAVA programming but now the person has to use C++ programming code because it is the most preferred computer programming language in this generation. Besides that, students are unable to understand the concept of each and every chapter and lack of practices which makes them feel nervous and stress during answering the practical programming questions in shorter period of time. Students were also facing difficulties in memorizing source code. Source code means the languages that are intelligible to programmers, rather than machine code, which is directly executed by the central processing unit.

After all this problems and research that we have done, all of the members brainstorm together to find out a suitable ways and solution to solve the problems faced by student as stated above. Since students can absorb and learn information easily by using certain techniques of learning programming interacting with their environment. After analyzing all the possibilities of problems and solution, we finally came out with a final decision in creating a programming software which guides you step by step in instance. In this software, students are enabled to learn programming faster and exchange between programming languages. Besides that, it can suggest complete sentences in your programming languages so that you can draft them in ease. Because it operates in the background, you can write a program like you normally would and this software will offer suggestion as you type. This software is basically like smart compose. This software helps save you time by cutting back on repetitive writing, while reducing the chance of bug or fault in your programming code. This solution enables students to understand their weakness and also keep in track in their programming studies.

Although our group members had some small argument and dispute during our discussion, but all of us are willing to listen and accept other members' point of view and come out a conclusion and product which all of us are satisfied. After that, we distributed all the task to every member like someone will be in charge of video making and others preparing the prototype and written report. Our spirit of team working make this project to be progressed and to be done on time.

## **ASSESSMENT POINT**

In order to achieve the best result, we kept on evaluating our idea and the process. Design thinking steps do provide solution to our problem but this process need to be repeated until the solution is perfect and exact. The assessment happen during the transition between each design thinking phases and at the end of the project demonstration.

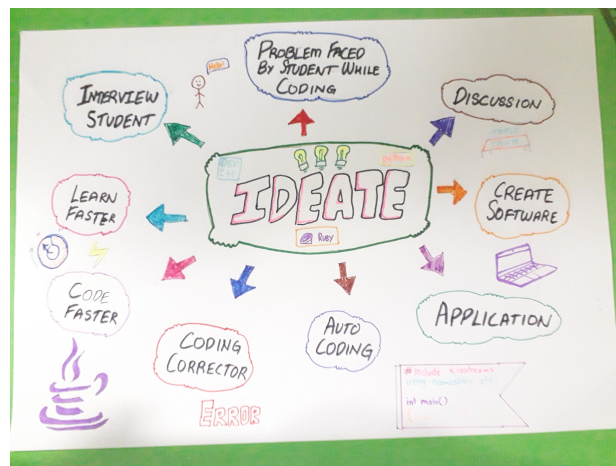
# DESIGN THINKING EVIDENCE



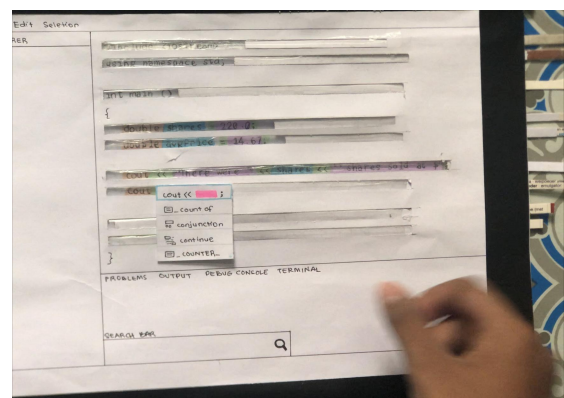
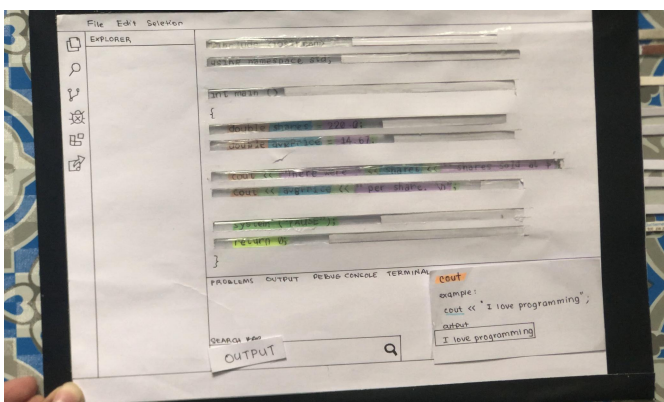
Empathy : Interview session with first year programming student.



Define : Brainstorming the needs for programming students



Ideate : came up with few ideas



Prototype we build

## REFLECTION

### **What is your goal/dream with regarding to your course/program?**

Regarding to the courses we are studying which is network and security, our main goal is to become a successful network and security engineer in the future. We hope to become a successful network and security engineer that equip with all the requirements a successful network and security engineer should have. For example, having deep knowledge of routing protocols such as MPLS, HAIPE/IP, QOS and WAN. We are looking forward to work as a part of security team in analyzing and implement new security protocols for greater efficiency against any threat or malfunctions. Also, we want to contribute our efforts to develop our country through digital technology.

### **How does this design thinking impact on your goal/dream with regard to your program?**

After we got involved in this design thinking project, it further strengthen our goal to become a network and security engineer. In this new digital era, almost everything will use technology and be connected in one network and we will be dependant with the technology. Throughout this design thinking process, we found out that this is the best way to provide a solution-based approach in solving real life problems since in network and security, we need to learn on how to improve the security in a network so we don't face any problem with any cyber threat. Undergoing the stages in design thinking which included empathize, define, ideate, prototype and test, we gained an insight on how to do if we are facing any problem especially when when we're facing with potential cyber threat as a network and security engineer. This further strengthen our convictions which is to become a network and security engineer that can contribute our efforts to the people needed. By mastering all these skills especially in problem solving, we really hope we can use our skill to help people out there and strengthen the security of a network or server so it wont be vulnerable to be attacked by a group of hacker that want to gain something such as our private data for a bad reason.

## **What is the action/improvement/plan necessary for you to improve your potential in the industry?**

We should have a mindset that never stop learning as there is many knowledge out there waiting for us to explore. Also, keep updating ourselves and master the skills that is needed for us to become a skillful network and security engineer. We believe that by keep improving our skills and self-value, we are able to improve our potential in the industry.

## **TASK FOR EACH MEMBER**

Every member of this group plays an important role in making this assignment a success. Each and everyone of us were given a task to finish up so that the progress will be smooth. Fathihah were assigned to do the report while Praveen and Isyraff took part in video making and editing task. Other than that, we cooperate and contribute the same amount of energy and time in making the prototype. By dividing our task, our project run smoothly because everyone already know what they were assigned to do.

## **LINK OF OUR DESIGN THINKING VIDEO**

<https://youtu.be/Yl23ZvkyLYw>