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**School Of Information Technology**

**IT2553 Data Structure and Algorithms**

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| **Module:** | IT2553-02 |
| **Tutorial:** | 02 |

1. In mathematics and Computer Science the typical definition of an algorithm is

A set of step-by-step instructions for solving problem.  
  
e.g., counting number of people in a room is a problem  
the steps to solving the counting the number of people in a room is an algorithm.  
for example

1 - let n be the number of people in the room

2 - for every person in the room:

3 - n += 1

Algorithm are implemented by translating the step by step instruction into a computer program that can be executed by a computer  
  
the translation process is called a computer programming or simply programming

1. Other examples of Algorithms I can find in my life are

1 - YouTube recommendation algorithm

In 2011 they used the clicks and view algorithm, so videos are recommended videos based on the number of clicks and view a video gets but these leads to youtubers taking advantage of this and create clickbait and misleading titles and thumbnails

In 2012 these changes to watch time, as YouTube research have found that users spend more time on the things they enjoy

In 2015 to today, the algorithm YouTube uses is based on the satisfactory and responsibility of contents, so when a viewer likes a video, it gets highlighted by the search algorithm that this video is satisfactory it should be recommended.

Source: Behind the Algorithms – How Search and Discovery Works on Youtube

<https://www.youtube.com/watch?v=9Fn79qJa2Fc>

2 – Dijkstra Algorithm is also used for internet routers to build the shortest routes to hop from one router to another.

3 – Cooking Recipe is a type of algorithm that people who cook uses to deliver very delicious and tasty meals.

4 – Facial Recognition, In Apple Face Id recognition system it uses a neural network and algorithms to detect whether the person looking at the phone is the owner. How it works is first the camera system will detect your face using a flood illuminator, then a dot projector will then project out over 30,000 invisible dots on your face. An infared camera will then snap the photo of your face and then uses the infared dots and image to make a mathematical model of your face (usually a 3d vector that is being mapped) and then compares it to the information stored. As a result step by step process to authenticating your face is an algorithm

5 – Chess uses the Minimax algorithm a type of game algorithm, then the game is augmented with alpha-beta pruning algorithm to decrease the number of nodes by the minimax algorithm in its search tree.

1. Algorithm to solving the tower of Hanoi

Let small disk be A

Let Middle disk be B

Let Large disk be C

And Let the order be 1 2 3 in terms of the pegs

1. Move A from 1 to 3
2. Move B from 1 to 2
3. Move A from 3 to 2
4. Move C from 1 to 3
5. Move A from 2 to 1
6. Move B from 2 to 3
7. Move A from 1 to 3