ASSIGNMENT 1 FRONT SHEET

Qualification	**BTEC Level 5 HND Diploma in Computing**		
Unit number and title	Unit 1: Programming		
Submission date		**Date Received 1st submission**	
Re-submission Date		**Date Received 2nd submission**	
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Student declaration I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice.			
		Student's signature	Duc

Grading grid

P1	P2	M1	D1

☼ Summative Feedback:	☼ Resubmission Feedback:	
Grade:	**Assessor Signature:**	**Date:**

Lecturer Signature:

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I.introduction

You currently work for ABC software, an independent software development company that designs and builds bespoke software solutions for various companies of different sizes that cover a range of different industries. The software that they design uses a wide range of technologies, from simple stand-alone programs to large web-based applications.

II.body

2.1 what is algorithms

An algorithm is a procedure used for solving a problem or performing a computation. Algorithms act as an exact list of instructions that conduct specified actions step by step in either hardware- or software-based routines.

Algorithms are widely used throughout all areas of IT. In mathematics, computer programming and computer science, an algorithm usually refers to a small procedure that solves a recurrent problem.

Algorithms are also used as specifications for performing data processing and play a major role in automated systems.

An algorithm could be used for sorting sets of numbers or for more complicated tasks, such as recommending user content on social media. Algorithms typically start with initial input and instructions that describe a specific computation. When the computation is executed, the process produces an output.

2.2 type of algorithms

There are several types of algorithms, all designed to accomplish different tasks:

- **Search engine algorithm.** This algorithm takes search strings of keywords and operators as input, searches its associated database for relevant webpages and returns results.
- **Encryption algorithm.** This computing algorithm transforms data according to specified actions to protect it. A symmetric key algorithm, such as the Data Encryption Standard, for example, uses the same key to encrypt and decrypt data. If the algorithm is sufficiently sophisticated, no one lacking the key can decrypt the data.
- **Greedy algorithm.** This algorithm solves optimization problems by finding the locally optimal solution, hoping it is the optimal solution at the global level. However, it does not guarantee the most optimal solution.
- **Recursive algorithm.** This algorithm calls itself repeatedly until it solves a problem. Recursive algorithms call themselves with a smaller value every time a recursive function is invoked.
- **Backtracking algorithm.** This algorithm finds a solution to a given problem in incremental approaches and solves it one piece at a time.
- **Divide-and-conquer algorithm.** This common algorithm is divided into two parts. One part divides a problem into smaller subproblems. The second part solves these problems and then combines them to produce a solution.

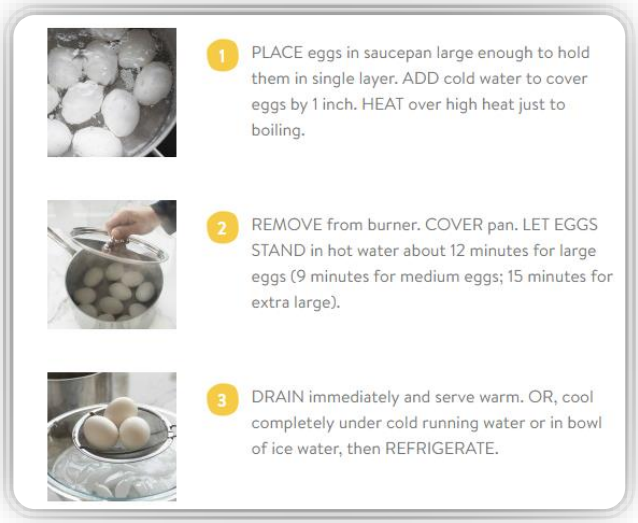
- **Dynamic programming algorithm.** This algorithm solves problems by dividing them into subproblems. The results are then stored to be applied to future corresponding problems.
- **Brute-force algorithm.** This algorithm iterates all possible solutions to a problem blindly, searching for one or more solutions to a function.
- **Sorting algorithm.** Sorting algorithms are used to rearrange data structures based on a comparison operator, which is used to decide a new order for data.
- **Hashing algorithm.** This algorithm takes data and converts it into a uniform message with a hashing.
- **Randomized algorithm.** This algorithm reduces running times and time-based complexities. It uses random elements as part of its logic.

2.3 way to solve a algorithm

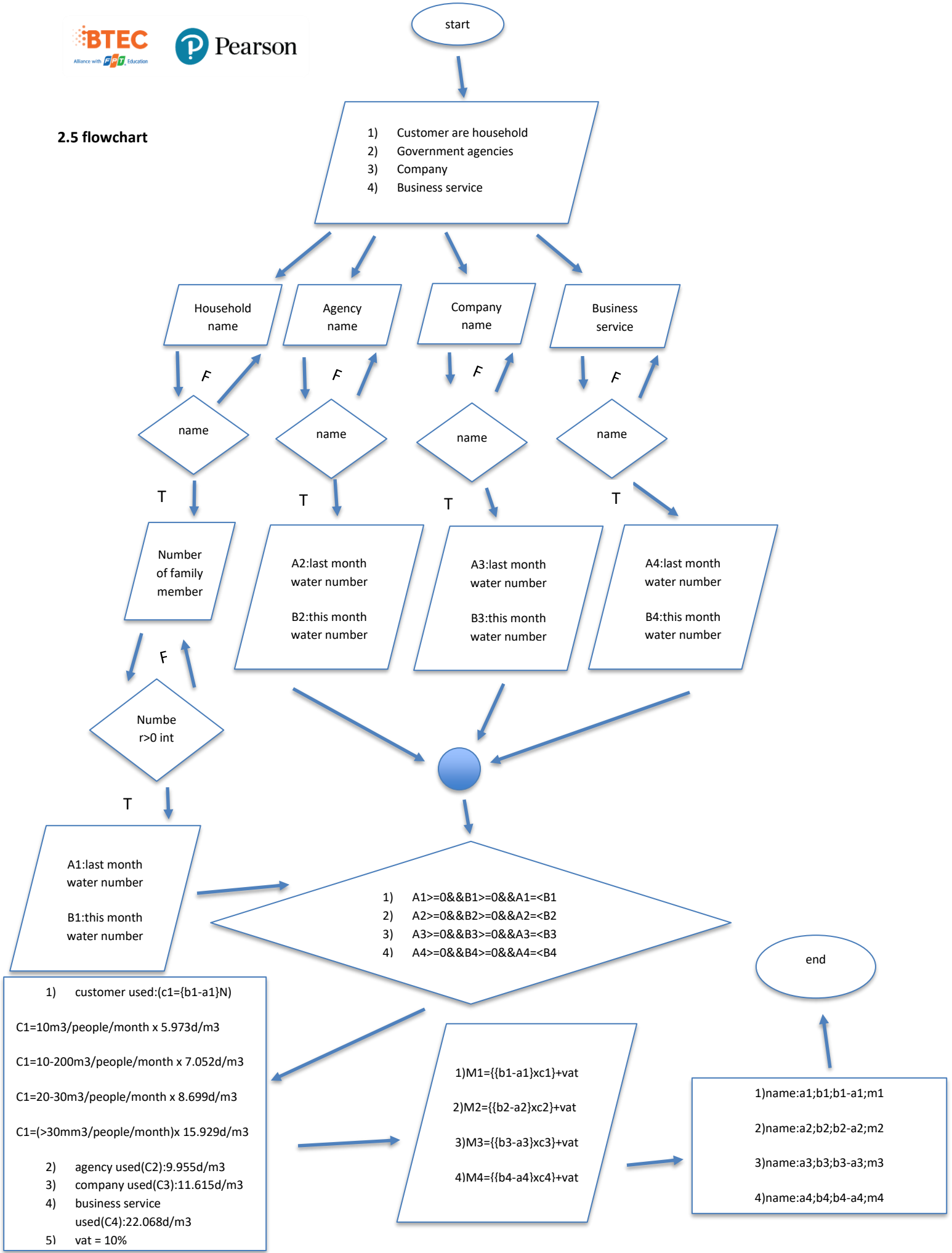
First we must make clear what type of customer we working with (for ex: agency , company,…vv)

Then depend on which customer type ,we will count each person per month (for ex: household), after that we begin to calculate the total water number which will depend on water number of this month and last month and some formula to give the final result

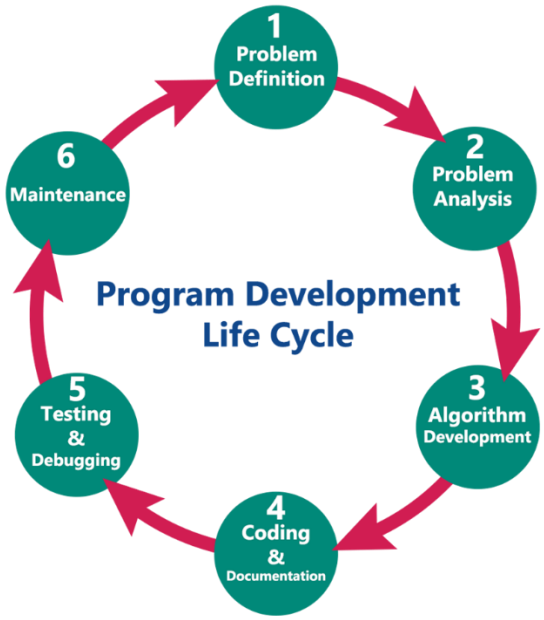
2.4 example of algorithm



2.5 flowchart



2.6 all steps to create a program



III. reference

Gillis, A. (2022). *What is algorithm?* [online] WhatIs.com. Available at: https://www.techtarget.com/whatis/definition/algorithm.