# INTRODUCTION

Diabetes is a non-communicable disease that causes 1.5 million deaths every year and affects 422 million people worldwide. Most of people with diabetes live in low to middle income countries [1]. In Indonesia, the highest mortality from chronic disease is caused by diabetes mellitus [2]. Diabetes is divided into four types, including IDDM (Insuline Dependent Diabetes Mellitus) or type 1 diabetes caused by autoimmune Langerhans beta cell damage, NIDDM (Non Insuline Dependent Diabetes Mellitus) or type 2 diabetes caused by relative failure of Langerhans beta cells and resistance insulin, gestational diabetes occurring during pregnancy, and specific diabetes [3,4]. Diabetes can strike anyone regardless of age or race. and more common in obese people. Diabetes can cause complications in the heart, nerves, kidneys and eyes [5].

To help control the blood sugar and minimize complications, diabetics must maintain the amount, type, and schedule of meals every day [6]. Face-to-face consultation with a nutritionist is needed to get food recommendations that is suitable for diabetics is not possible to do every day. Although now telemedicine has developed which can help diabetics get consultation with a nutritionist online, this is not effective and efficient if done every day and costs a lot [7]. Therefore, diabetics need to develop a food recommender system that has been validated by a nutritionist and can provide recommendations automatically to manage their daily meal menu.

We found a lot of research that built a food recommender system for diabetics. However, these studies have not considered the water intake for diabetics. Even though we found research in India that applied hydrotherapy as a therapy to regulate blood sugar for diabetics. Water is also a medium for delivering nutrients and other substances into the body's cells and removing toxic substances so that the water consumed will affect the patient's blood sugar [8]. Therefore, we are considering building a recommender system that also regulates the amount of water intake of users.

Ontology is used as a knowledge domain to represent various types of food and the amount of mineral water served for users. The Semantic Web Rule Language (SWRL) search method is an option in inducing food menus and mineral water intake to users because it can provide more expressiveness compared to using a relational database which cannot produce output if the data sought is not found. Several studies have also used ontology and SWRL to recommend food menus [9].

There is study that uses conversational systems to interact with users. However, the flexibility in conversional systems that use chatbots is better, so it needs to be considered [10]. Chatbots have the ability to interact with users without the need for a third person to provide feedback by utilizing Artificial Intelligence (AI). Chatbot through Telegram social media is used to make it easier for users to interact with the system through applications that are worldwide and familiar to users and can be downloaded for free on their smartphones [11,12,13].

Based on the problems discussed in this study, we developed **DiabeticFoodBot** using the Telegram Chatbot-based ontology and SWRL. This system was developed to make it easier for diabetics to determine the amount, type and time of food consumption based on the validation results of nutritionists. This recommender system provides information regarding the amount of water consumption required by the user. Our research also uses matrix unit serving sizes and household measurements in presenting recommendations to make it easier for users to determine food portions.