

## Sprint 0(Diabetes Analytics)

### The Problem area:

The number of **Adult** diabetics around the world were reported to be almost 537 million in 2021 and this number is predicted to rise to 643 million by 2030 which is almost an increase of 19%.

Some Key Facts stated by WHO:

- **The number of people with diabetes rose from 108 million in 1980 to 422 million in 2014. Prevalence has been rising more rapidly in low- and middle-income countries than in high-income countries.**
- **Diabetes is a major cause of blindness, kidney failure, heart attacks, stroke and lower limb amputation.**
- **Between 2000 and 2019, there was a 3% increase in diabetes mortality rates by age.**
- **In 2019, diabetes and kidney disease due to diabetes caused an estimated 2 million deaths.**
- **A healthy diet, regular physical activity, maintaining a normal body weight and avoiding tobacco use are ways to prevent or delay the onset of type 2 diabetes.**
- **Diabetes can be treated and its consequences avoided or delayed with diet, physical activity, medication and regular screening and treatment for complications.**

Now some problem-solving questions or some relevant questions can be:

- Can we predict Diabetes by monitoring someone's lifestyle?
- Can we diagnose diabetes with a set of questioners?
- If we are successful in the diagnosis, can we figure out the type of Diabetes?
- Can we also address the chances of a person getting Alzheimer's if they have type 2 diabetes? "It's an accepted fact that people with Type 2 diabetes have a higher risk of Alzheimer's disease" (*Mayo Clinic Minute: Is Alzheimer's type 3 diabetes?* - mayo clinic news network 2018)

### The User:

This model will cater the people who feel early symptoms of diabetes or if their family notices anything unusual. Additionally, if a person feels that someone in their bloodline has diabetes, for safety they also may consider checking up their risks with diabetes. It can also cater to general population who is always interested in knowing more about their body. The people who already know they have diabetes can also get the benefit of this model by as they could analyse their risk of getting Alzheimer's and take necessary measures for prevention. Additionally developing countries like Pakistan's 23% adult

population is diabetic so this model would impact countries like these to give them an unofficial diagnosis for them to take quick actions with easy accessibility to the service.

### **The Big Idea:**

One of the BrainStation Alumni **Harry Zhou** worked on a similar project which was about predicting diabetes in the United States, Harry Zhou leveraged Regression in supervised learning to achieve his outcome in this project.

### **The Impact:**

By spotting these conditions early, doctors can act sooner, potentially slowing their progress and improving patients' lives. These models help tailor healthcare plans to individuals, saving money and resources by preventing expensive treatments later on. They also aid researchers in finding better treatments faster and guide public health efforts to promote healthier lifestyles. Plus, they enable insurance companies and employers to offer targeted support and wellness programs. Overall, these models play a crucial role in improving health outcomes and reducing the burden of these diseases on individuals and society.

### **The Data:**

Here are a few links to some relevant data sets:

<https://www.kaggle.com/datasets/uciml/pima-indians-diabetes-database>

<https://www.kaggle.com/datasets/johndasilva/diabetes>

<https://www.kaggle.com/datasets/jboysen/mri-and-alzheimers>

<https://catalog.data.gov/dataset/alzheimers-disease-and-healthy-aging-data>

### **The Alternative:**

The alternative would be excluding the Alzheimer's part and predicting diabetes in a particular region preferably an underdeveloped country.

## Reference Page

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