DC Task 2

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1 Introduction

This will be your second task as a DC in the club. Hope you got good grasp over python basics from the first Task.

Every time you proceed to take up a task, we suggest you ponder on the need for it (i.e., **"Why?"**) and understand the process while you follow any course/blog/tutorial online (i.e., **"How?"**). You have only understood a topic when you can explain it to others in the simplest possible manner.

Deadline

3rd Mar 2023

Task

1 Mathematically prove why gradient descent works (more formally, why the algorithm converges). Hint: Taylor Series, but how does it come into play here :D? You can revisit Gradient Descent here

2 **Data Visualization Challenge:** A dataset contains employee data who left the company between 4/2012 and 3/2015. The meaning of each of the column names in mentioned in the figure below. Your task is to visualize and provide some useful insights from the data. Be as creative as you can. You can work on it individually or collaborate with other DCs. Here's the link to the challenge: task2. You can use look at the following references to get started:

  – Documentation

  – Data Visualization cheat sheet: link

  – Matplotlib gallery:link and Summer School 2021

3 **Logistic Regression with a Neural Network mindset:** You will build a logistic regression classifier to recognize cats in a guided notebook. This assignment will step you through how to do this with a Neural Network

mindset, and so will also hone your intuitions about deep learning.

Instructions

- Build the general architecture of a learning algorithm, including:
    * Initializing parameters
    * Calculating the cost function and its gradient
    * Using an optimization algorithm (gradient descent)
- Gather all three functions above into a main model function, in the right order.
- Do not use sklearn, use numpy and pandas only.
- **Caution: Do not copy pre-existing implementations blindly.**

Submission Format: Submit your repository in your respective DC groups/to your mapped coordinator.

Tips

- If you need any further resources to get a better understanding, do get back to us.

- It might be a bit of struggle to start off with ML at first, but do not be overwhelmed by the task and take it step-by-step. Looking at pre-existing implementations to get an idea will surely help, but copying won't.