

NLP Interface for CI/CD pipeline generation and Cloud Infrastructure Management

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Abstract

In the current world of Information technology there is a need for software applications to be deployed rapidly. With many tools available for Software Engineers and DevOps Engineer there is always pressure to know and operate different tools. This can cause development teams to spend more time on deployments rather than focusing on the main task of developing software products.

The proposed research attempts to bring the ease of deployments to developers as well as DevOps Engineers to simply use a chatbot and deploy applications and also manage cloud infrastructure. This will be an improvement from the current practice of manually visiting each tool to manage respective components.

For the system to be built, comprehensive literature review was conducted to identify any existing product that cater the requirement. Since this domain is not attempted before, this will be a novel approach and a domain first for the suggested solution.

The research project aims to develop an NLP model that could be used to identify the user intent and act accordingly. Since gathering vast amount of training data is not feasible due to time and resource constraints, the model will be based on BERT model with transfer learning technique used.

The developed software product can use the UI to capture the user inputs then extract information from NER techniques used within BERT model. These captured elements are maintained in a chatbot conversation till satisfactory level of details are capture for CI/CD pipeline to be created and also for the cloud infrastructure deployments as well.

The developed model is evaluated with over 90% accuracy for identifying user inputs correctly and creating necessary pipelines and infrastructure in an efficient manner. At the evaluation step it was noted that the system performs the said deployment within 15 minutes which is more efficient than a human deploying the same configuration manually.

Keywords: CI/CD, Cloud, NLP, BERT, AWS, GitLab, NLU, Transformers, Deep Learning