

GRIHAM-C

Grievance Hierarchical Analytics Monitoring- through Clustering

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Solution Submitted For:

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एन आई सी
National
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Centre

#startupindia

ONLINE HACKATHON ON

DATA-DRIVEN INNOVATION FOR
CITIZEN GRIEVANCE REDRESSAL - 2024

DATA-DRIVEN



ABSTRACT

Solution for: Problem Statement 1

"GRIHAM-C: Grievance Hierarchical Analysis and Monitoring – through Clustering" is a comprehensive system designed to enhance the analysis and monitoring of grievances through advanced natural language processing techniques, like a home to monitoring the grievances once they are submitted. The project leverages state-of-the-art transformers language models, specifically tailored for zero-shot classification of grievances and textual submissions. The system integrates an independent summarizer model and translation capabilities, contributing to efficient grievance monitoring until it reaches the last-mile officer.



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INTRODUCTION

PROBLEM STATEMENT 1 : Develop an AI/ML-driven system for topic clustering/modelling to enable auto-categorisation of received grievance reports for sharing of the same with last-mile officers concerned. The proposed solution may include mechanism for sharing received grievance reports with various registered officials as well as monitoring/tracking of reports concerned.

Technology used:

Programming Language: Python

- NLP tool: The model trained using custom dataset is an mnli model **cluster_model_worksfine**
- Front-end tool: Streamlit library
- Training Module: Training code is as per the steps involved in the fine tuning of a large inference language for demonstration purpose.

MAIN CONCEPTS

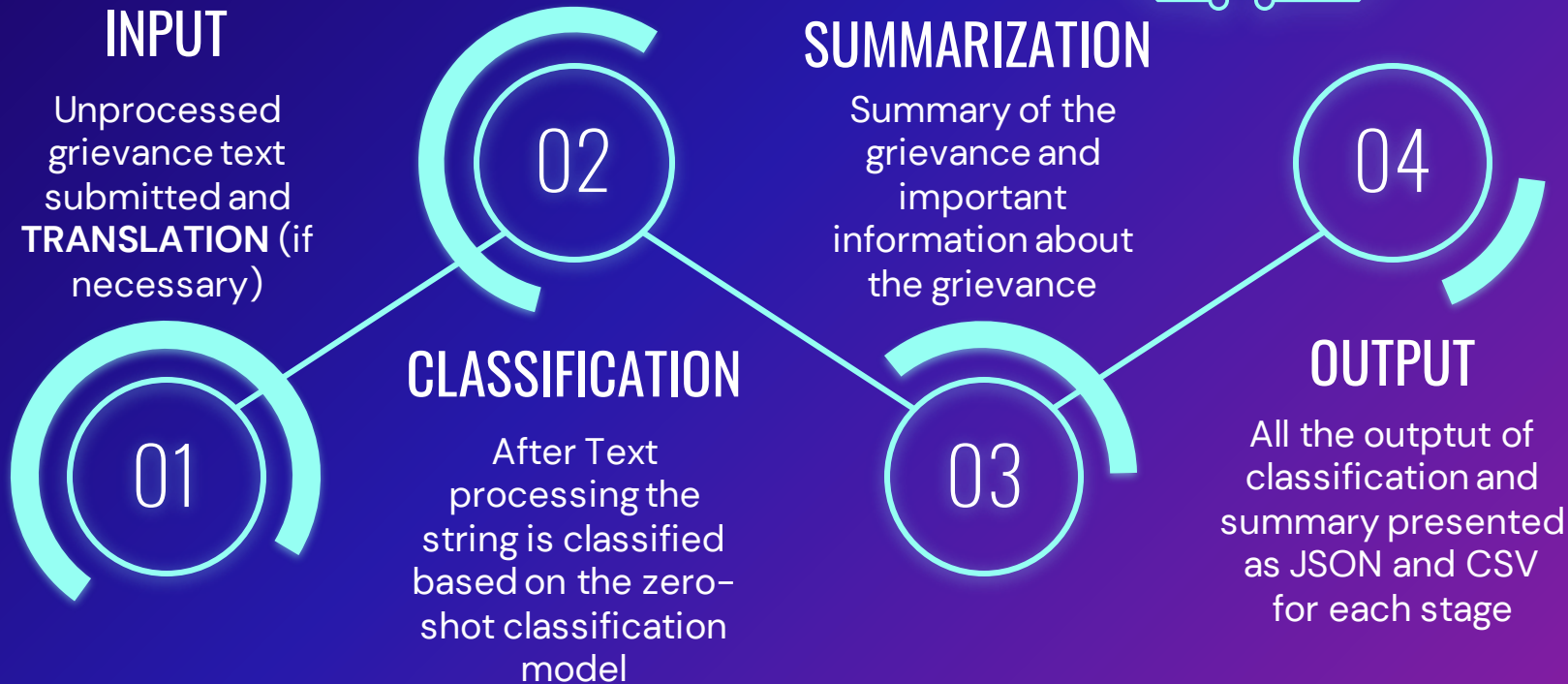
"GRIHAM-C" offers a robust and versatile solution for the hierarchical analysis and monitoring of grievances. The combination of a specialized zero-shot classification model, an efficient summarizer, and a translation module collectively enhances the system's capabilities, providing valuable insights for effective grievance resolution.

There are 3 main modules in which the classification model forms the primary task of the solution. The 3 modules are:

- Classification module
- Summarization module
- Translation module (for Indian language grievances)



PROJECT PROCESS



KEY FEATURES



Automating classification of the text using the labels in the backend



Hierarchical Analytics done in every stage with the organizations' labels in every stage



Top 5 Classifications possible are returned for every stage



Grievance summary consisting of important information is returned as a part of output



Independent translation option and classification model trained with 20 hours of training data



Visualizer tool included to generate JSON and CSV files based on each stage for classified texts.



GRIHAM-C: Demo

This page is demo only. The proposed trained model code can be viewed in GRIHAMC-ReportGen.ipynb, which is the backend

Select an OrgCode

CBODT

(And)

Select the Grievance Id

CBODT/E/2023/0000018

GRIHAM- Clustering

Grievance Hierarchical Analytics Monitoring Clustering

Make sure classification_report.json file is generated and in path

Grievance Text appears here:

Show Classification

Show Summary

empty



GRIHAM-C: Demo

This page is demo only. The proposed trained model code can be viewed in GRIHAMC-ReportGen.ipynb, which is the backend.

Select an OrgCode

ARNPG

(And)

Select the Grievance Id

ARNPG/I/2023/0000006

Enter

ARNPG/I/2023/0000006

Hi team my name is Ramesha naik s s/o shivu naik h building G1 Room number 23 kavary layout kudlu village bhomanalli post bangalore X6X0X8XI am living my birth 08 member in my family sir government not give any benifits my family sir I am more time informed government officer but not tack care so i am poor parson so what can I do sir my government benifits give only implanse parson only give all benifits so poor people not give benifits sir what can I do sir I am already completed

Show Classification

Show Summary

	Stage 1	Stage 2
Best Itel	Department of Administrative Reforms and Public Grievances - PG Division	Administrative Matters Related
Top 5 Itel	['Department of Administrative Reforms and Public Grievances - PG Division']	
Best Itel	6261	6267

	Best Items
Stage 1	Department of Administrative Reforms and Public Grievances - PG Division
Stage 2	Administrative Matters Related

Grievance Summary appears here:

Hi team my name is Ramesha naik s s/o shivu naik h building G1 Room number 23 kavary layout kudlu village bhomanalli post bangalore X6X0X8XI am living my birth 08 member in my family sir government not give any benifits my family. I am more time informed government officer but not tack care so i am poor parson so what can I do sir.



GRIHAM-C: Demo

This page is demo only. The proposed trained model code can be viewed in GRIHAMC-ReportGen.ipynb, which is the backend

Select an OrgCode

AYUSH ▼

(And)

Select the Grievance Id

- AYUSH/E/2023/0000001 ▼
- AYUSH/E/2023/0000001
- AYUSH/E/2023/0000035

Show Classification

Show Summary

empty

empty

Grievance Summary appears here:

Grievance translation (if any) appears here:



GRIHAM-C: Demo

This page is demo only. The proposed trained model code can be viewed in GRIHAMC-ReportGen.ipynb, which is the backend

Select an OrgCode

AYUSH

(And)

Select the Grievance Id

AYUSH/E/2023/0000001

Enter

Make sure classification_report.json file is generated and in path

Grievance Text appears here:

Show Classification

Show Summary

Generating classification!

Classification:

	Stage 1	Stage 2
Best Iter	Ayush	Lab & Pharmacopeia
Top 5 Iter	['Ayush']	['Lab & Pharmacopeia', 'Ayush Schemes', 'Ayush Drugs Pol
Best Iter	22801	23190

IMPLEMENTATION AND FUTURE IMPROVEMENTS ADDRESSED

- This system generates the outputs in JSON and CSV files for each Department. Further can be extended for generating reports for each stage by simple selection operations. **The demo of clustering and writing the JSON file, grouping the grievances based on the stages is included in GRIHAMC_Front_end.ipynb, as a simple cell.** (Refer Video).
- **The report generation system will be setup as a backend and automated** with each grievance submission. The visualizer is just for demo purposes.
- All the dataset used in the development is the **datasets provided** for the competition, **converted as JSON files** for faster access, which are shared in a folder along with the model files.
- **The training code** used for the same is found in GRIHAMC_TrainingFinal.ipynb.



THANKS

For any questions
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Kindly refer to the handout GRIHAM-Clustering.pdf
attached in GITHUB

Disclaimer: This system is developed and presented by
the author: S. Meenakshi and is the original creation of the
author.

