Automated DVP Generation using Mistral LLM

# Automated DVP Generation using Mistral LLM

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* Tools: Mistral, Transformers, Python, LLMs

# Problem Statement

* Automotive requirements documents are often unstructured (e.g., Word files).
* Manually extracting test cases and BCM output is time-consuming.
* Goal: Automate test case generation using an LLM.

# Objective

* Extract requirements from raw Word (.docx) files.
* Use LLM (Mistral) to generate BCM Expected Output.
* Create structured Excel output for test cases.

# What is Mistral LLM?

* Mistral-7B is an open-source language model by Mistral AI.
* Efficient and powerful for custom NLP tasks.
* Capable of reasoning and generating structured responses.

# What are Transformers?

* Transformers use self-attention for understanding context.
* Used in BERT, GPT, T5, and Mistral.
* Powered by HuggingFace Transformers library.

# Workflow

* 1. Load .docx file
* 2. Extract plain text
* 3. Parse requirement lines
* 4. Use LLM to generate output
* 5. Export structured Excel

# Tech Stack

* LLM: Mistral-7B
* Framework: HuggingFace Transformers
* Text Parsing: python-docx, regex
* Tabular Output: pandas

# Prompt Design for Mistral

* Requirement: {requirement}
* Test Description: {description}
* Precondition: {precondition}
* Action: {action}
* → Prompted to generate: BCM Expected Output

# Excel Output Sample

* | Req ID | Desc | Action | BCM Output |
* |--------|------|--------|-------------|
* | WPR\_001| Wiper On | Switch ON | Motor spins...

# Future Improvements

* Use RAG to improve context.
* Enable PDF or scanned file input with OCR.
* Add GUI interface for ease of use.

# Conclusion

* Automated test case generation using LLM.
* Saves manual effort and ensures consistency.
* Applicable in real-world automotive domains.