

VIETNAM NATIONAL UNIVERSITY, HO CHI MINH CITY
UNIVERSITY OF TECHNOLOGY
FACULTY OF COMPUTER SCIENCE AND ENGINEERING



Programming Intergration Project (CO3101)

Group 4:

*“Research and build AI chatbots using
Retrieval-Augmented Generation for a
music-related website, with Speech-to-Text
and Text-to-Speech integration”*

Instructor(s): Nguyễn Quốc Minh

Students: Nguyễn Thiện Minh - 2312097
Huỳnh Đức Nhân - 2312420
Phạm Trần Minh Trí - 2313622

HO CHI MINH CITY, DECEMBER 2025



Contents

List of Figures	3
List of Tables	3
Member list & Workload	3
1 Introduction	4
2 Prerequisite: ANN, Transformer, LLM	5
3 Agent, URAG, LangChain	6
4 Retrieval-Augmented Generation for Large Language Models: A Survey	7
5 Reranking, RAG-Reasoning, RAG-RL	8
6 Implementation: LangChain, Text-to-speech, Speech-to-text	9
7 Evaluation	10
8 Conclusion	11
References	12



List of Figures

List of Tables

1	Member list & workload	3
---	----------------------------------	---



Member list & Workload

No.	Fullname	Student ID	Problems	% done
1	Nguyễn Thiện Minh	2312097	- Exercise 1: 1.2 - Exercise 2 - Exercise 3: 3.2	100%
2	Huỳnh Đức Nhân	2312420	- Exercise 1: 1.3 - Exercise 2 - Exercise 3: 3.1 - Exercise 4	100%
3	Phạm Trần Minh Trí	2313622	- Exercise 1: 1.1 - Exercise 4 - L ^A T _E X	100%

Table 1: Member list & workload



1 Introduction



2 Prerequisite: ANN, Transformer, LLM



3 Agent, URAG, LangChain



4 Retrieval-Augmented Generation for Large Language Models: A Survey



5 Reranking, RAG-Reasoning, RAG-RL



6 Implementation: LangChain, Text-to-speech, Speech-to-text



7 Evaluation



8 Conclusion



References

- [1] LangChain Documentation. *Build a RAG agent with LangChain*. Accessed: 2026-01-05.
LangChain. 2025. URL: <https://docs.langchain.com/oss/python/langchain/rag>.