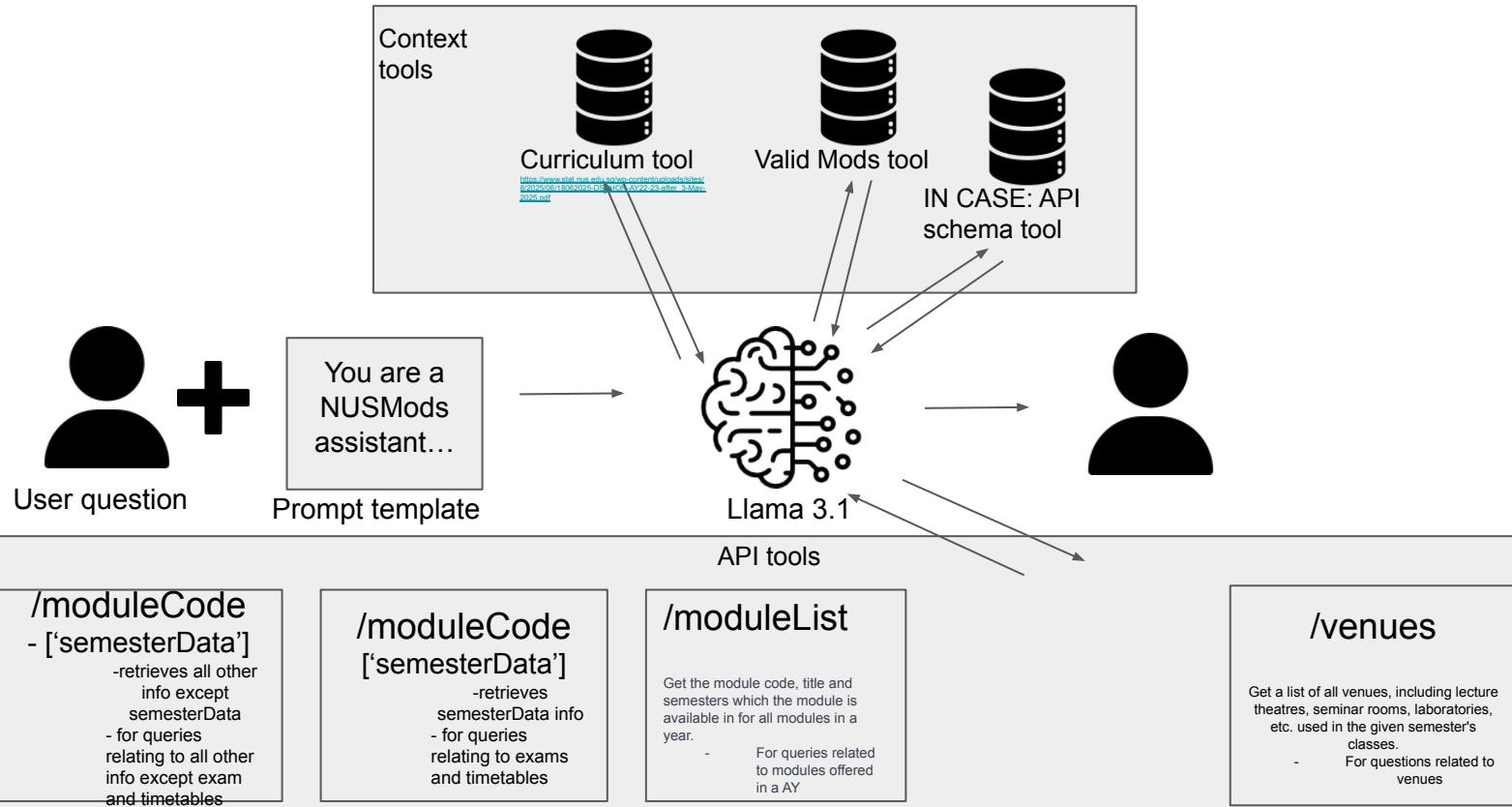


# Chatbot Architecture



# Prompt template

"You are a NUS DSDS Module Planning assistant..."

- Only answer questions related to NUS DSA Major module planning (first check if its a module inside the valid list of modules)
- Describe what each tool is for and when to use it
- Always query context tools to gather more information and ensure you understand the question before querying API tools
- You may use multiple tools to arrive at your answer (if question requires info from multiple places)
- If the user asks questions outside of NUS DSA Major, say sorry and give them the url to NUSMods
- If you require more information/clarification, ask a question back to the user

# Context tools

- Curriculum tool
  - Specially curated info dump comprising DSA major requirements (core mods + CHS mods)
    - [https://www.stat.nus.edu.sg/wp-content/uploads/sites/8/2025/06/18062025-DSAHON-AY22-23-after\\_3-May-2025.pdf](https://www.stat.nus.edu.sg/wp-content/uploads/sites/8/2025/06/18062025-DSAHON-AY22-23-after_3-May-2025.pdf)
    - <https://www.stat.nus.edu.sg/current-students/undergraduate-programme/programme-structure/>
  - Vectorise the document and retrieve top n similar chunks
- Valid mods tool
  - List of valid mods that are inside the chatbot's scope
  - Vectorise but can just retrieve entire document
- Optional: API schema tool
  - In case LLM doesn't understand the structure returned by the get\_module\_sem\_info tool (semesterData key has the most complex structure)
  - Provide contextual descriptions about each nested subkey
  - Provide examples and how to interpret them ----->
  - Can get from  
[https://api.nusmods.com/v2/#/Modules/get\\_acadYear\\_modules\\_moduleCode\\_json](https://api.nusmods.com/v2/#/Modules/get_acadYear_modules_moduleCode_json)

```
SemesterData ▼ {  
    semester* number  
    examDate string($date-time)  
    examDuration number  
    example: 1200  
    timetable ▼ [Lesson ▼ {  
        classNo* string  
        startTime* string  
        endTime* string  
        example: 1100  
        weeks* > (...) string  
        venue* string  
        day string  
        lessonType* string  
        size number  
        example: COM1-0208  
    }]  
}
```

# API tools

- Get\_all\_modules (/moduleList)
  - Input: acad year
  - Output: list of all modules offered in specified acad year
  - For: queries related to modules offered, macro view of modules
- Get\_module\_other\_info (/moduleCode)
  - Input: module code
  - Output: all information about specified module except semesterData:
    - acadYear, additionalInformation, attributes, attributes.mpes1, attributes.mpes2, department, description, faculty, fulfillRequirements, gradingBasisDescription, moduleCode, moduleCredit, preclusion, preclusionRule, prereqTree, prereqTree.or, prerequisite, prerequisiteRule, **semesterData**, workload
  - For: non-exam and timetable queries related to specific module eg. “what are the preclusions/prereqs for DSA4213?”, “what is DSA3101 about?”
- Get\_module\_sem\_info (/moduleCode)
  - Input: module code
  - Output: semesterData information
    - semesterData[].covidZones, semesterData[].examDate, semesterData[].examDuration, semesterData[].semester, semesterData[].timetable, semesterData[].timetable[].classNo, semesterData[].timetable[].covidZone, semesterData[].timetable[].day, semesterData[].timetable[].endTime, semesterData[].timetable[].lessonType, semesterData[].timetable[].size, semesterData[].timetable[].startTime, semesterData[].timetable[].venue, semesterData[].timetable[].weeks
  - For: exam and timetable related questions e.g. “DSA1101 have classes on which days? What are the lecture/tutorial slots? I can choose”
- Get\_venues (/venues)
  - Input: acad year, semester
  - Output: all venues used for classes in specified semester
  - For: quite useless