AI Application Labs: Tools and Techniques in Non-Degree Business Education

This workshop empowers you to harness the transformative power of AI for tangible business outcomes. Gain a practical understanding of generative AI and its applications in areas like data analysis, content creation, and process automation.

Go beyond the hype and develop the skills to leverage AI for strategic decision-making, competitive advantage, and increased efficiency within your organization.

Learning Objectives

In this workshop, you will:

- Understand the core concepts of how generative AI is revolutionizing industries.
- Navigate leading AI platforms and identify the tools that align with your specific business needs.
- Master prompt engineering techniques to effectively communicate with and direct AI models.
- Go beyond text and leverage AI to analyze images, audio, and video for deeper insights.
- Evaluate AI-generated content, identify trends, and extract knowledge to inform strategic decisions.

There are 3 different types of Generative AI platforms :

- ○ Platforms for consumers.
- ○ Platforms for Developers
- ○ Platforms for Enterprises
- **These are examples of platforms that you can leverage for this lab and for your future use-cases.**
  - Mistral :
    - ○ Consumer platform : https://chat.mistral.ai/chat
    - ○ Developer platform : https://console.mistral.ai/
    - ○ List of models :
      - ■ Mistral Nemo

- - - Mistral Large 2
    - Mistral small 24.09
    - Specialist models : Codestral, Pixtral
    - Legacy models :
      - Mistral 7B
      - Mistral 8x7B
      - Mistral 8x722B
      - Mistral Large
      - Mistral small 24.02
      - Mistral Medium
- OpenAI :
  - Consumer platform : https://chatgpt.com/
  - Developer platform : https://platform.openai.com/
    - List of models :
      - Gpt-4o-mini
      - Gpt-4o
      - Gpt-4-turbo
      - Gpt-4
      - Gpt-3.5-turbo
      - Gpt-4o-mini-2024-07-18
      - gpt-3.5-turbo-0125..
- Google :
  - Consumer platform : https://gemini.google.com/
  - Developer platform : https://aistudio.google.com/
    - List of models :
      - Gemini 1.5 Pro
      - Gemini 1.5 Pro 002
      - Gemini 1.5 Flash 002
      - Gemini 1.5 Flash 8B
      - Gemma 2 2B
      - Gemma 2 9B
      - Gemma 2 27B
- Anthropic :
  - Consumer platform : https://claude.ai/
  - Developer platform : https://console.anthropic.com
    - List of models :
      - Claude-3.5-sonnet-20240620

- - Claude-3-opus-20240229
  - Claude-3-haiku-20240327
  - Claude-2.1
  - Claude-2.0
  - Claude-instant-1.2
- Each of these models is known for its particular performance, latence and safety guardrails.
- Before leveraging any of these models to production, it is highly recommended to review the documentation of each and select the one that is the most appropriate for your use-case.

Activity 1 : Unlocking Data Insights with Generative AI

Learning Objectives:

- Understand the capabilities of large language models for data analysis.
- Practice analyzing and interpreting AI-generated insights.
- Explore different output formats for presenting data.

Tools:

- **Google AI Studio (aistudio.google.com)**
- The provided CSV file (with sales data, including dates)
  https://github.com/rihanamsaddek/AI-applications-lab/blob/main/Labs%20example%20-%20Data%20Format%20Conversion_.csv

Instructions:

1. **Introduction:**

   - Do you know that Multimodal Generative AI models can **understand**, **process**, and **generate** human-like text. These models can be incredibly helpful for analyzing data and extracting meaningful insights.
2. **Step 1 : Explore the data**

   - Open the provided CSV file in your local computer.
   - Take a few minutes to familiarize yourself with the data. **What are the columns? What types of information does it contain? What questions come to mind when you look at this data?**
3. **Step 2 : First Prompts:**

   - In the AI Studio prompt interface, enter the following prompts, one at a time, and observe & write the model's output:
     - **Prompt 1:** "Analyze this spreadsheet and identify the top 3 selling products in Q2 2024."
     - **Prompt 2:** "Provide a summary of sales performance by region."
4. **Step 3 : Iterative Prompting:**

   - Now, let's refine our prompts to get more specific or different types of answers. Try these:

- ■ "Show the top 3 products in Q2 2024 *by revenue*."
- ■ "Which region had the *lowest* sales in Q2 2024, and what were the total units sold there?"
- ■ "Compare the sales performance of the top 2 products across all regions."

5. **Output Formats:**

   - ○ AI models can present data in various ways. Experiment with this prompt:
     - ■ "Show the regional sales summary in a table."

6. **Advanced Exploration:**

   - ○ Let's see if the AI can help us with more complex tasks:
     - ■ "Generate a formula that identifies products with sales above the average."

7. **Creative Summary:**

   - ○ Finally, let's challenge the AI to summarize our findings creatively:
     - ■ "Write a short summary for a CEO describing the key trends in Q2 2024 sales data."

Try to analyze one of your spreadsheets with similar prompts to the ones you tried.

Activity 2 : Explore the different Modalities and Languages of Generative AI models :

Goal: Evaluate the capabilities of Generative AI models across various input modalities (audio, video, text) and languages.

Part 1: Audio Processing

Input: https://github.com/rihanamsaddek/AI-applications-lab/blob/main/xx_Monday-at-3-54-PM%20(3).wav

Prompt 1 (English): "Generate a verbatim transcript of this audio clip."

Prompt 2 (French): "You are a sports commentator specializing in football (soccer). Translate this audio clip into French."

Part 2: Video Processing

1. Input: ▶️ Lecture 1 | Programming Paradigms (Stanford)
2. **Prompts:** Use your preferred prompting style, but ensure the prompts cover these aspects:
    a. Summary: "Summarize the main points of this lecture."
    b. Key Takeaways: "Identify the key takeaways from this lecture."
    c. Presentation Analysis: "Analyze the speaker's presentation style (e.g., clarity, engagement, use of visuals)."

Part 3: Document Processing and Form Filling

1. **Source Document:** (Alice Doe's resume, provided in the image)
2. **Target Form:** (Job Application Form for MNO Inc., provided in the image)
3. **Task:** Use the information from Alice Doe's resume to automatically populate the fields in the job application form.

Example of a prompt :

Here is the source document from which you will get the information needed to fill out the specified field in the target form.

Alice Doe

San Francisco, California | alice.doe@website.com |123-555-4444 | LinkedIn

Experience

Marketing Manager, ABC Company,   June 2022-Present
- Developed and executed marketing campaigns that increased website traffic by 25% and generated $1 million in revenue.
- Managed social media accounts, email marketing, and content creation.

Marketing Specialist, XYZ Corporation,   July 2020-June 2022
- Conducted market research and analyzed data to identify target audiences and develop effective marketing strategies.
- Created and managed marketing materials, including brochures, website content, and social media posts.

Skills

- Marketing Strategy Development
- Market Research and Analysis
- Digital Marketing
- Content Creation
- Social Media Management
- Email Marketing
- Customer Relationship Management (CRM)
- Microsoft Office Suite
- Adobe Creative Suite

Education

Master of Business Administration (MBA), University of California, Berkeley, 2020
Bachelor of Science in Marketing, California State University, Northridge, 2018

Now here is the target form:

Job Application Form for MNO Inc.

Application for: **Marketing Manager**

Personal Information
Full Name: _____

Address: _____

Phone Number: _____

Email Address: _____

Education
Degree(s) Obtained: _____

University/Institution: _____

Years Attended: _____

GPA (if applicable): _____

Relevant Experience
List up to 2 past experiences:

Experience 1
      Company Name: _____

      Position Title: _____

      Years of Experience: _____

      Key Responsibilities and Accomplishments:

      _____

      _____

      _____

Experience 2
      Company Name: _____

      Position Title: _____

      Years of Experience: _____

      Key Responsibilities and Accomplishments:

      _____

      _____

      _____

Addition Questions
Why are you interested in this position?

_____

_____

_____

_____

What are your strengths and weaknesses as a marketer?

_____

<u>Write the right prompt to fill out the form and specifically the value in the red box.</u>

Activity 3 : Improve your prompt engineering skills with these best practices.

This activity focuses on improving your prompt engineering skills by structuring prompts effectively. A well-structured prompt includes six key components:

[Persona] + [Context] + [Task] + [Exemplar] + [Format] + [Tone]

Activity: Practice crafting prompts using the six components above. Experiment with different combinations to understand their impact on the AI's response.

Persona:

Definition: Persona refers to the identity or role you want the AI to assume when generating the response. It helps set the context and tone for the interaction.
Example: "Imagine you are a friendly customer support agent..."

Context:

Definition: Context provides background information about the situation or scenario in which the conversation takes place. It helps the AI understand the setting and frame its response accordingly.
Example: "...helping a customer troubleshoot a technical issue with their smartphone."

Task:

Definition: Task outlines the specific action or information you want the AI to provide in its response. It clarifies the purpose of the conversation.
Example: "...provide step-by-step instructions to reset the device and restore connectivity."

Exemplar:

Definition: Exemplar offers an example or sample of the type of response you're looking for. It guides the AI by showing the desired style or content.
"For instance, you might say: 'To reset the device, go to Settings > System > Reset > Factory Reset.'"

Format:

Definition: Format specifies how you want the response to be structured or presented. It can include elements like headings, bullet points, or specific sections.
Example: "Please organize your response in a step-by-step format with numbered instructions."

Tone:

Definition: Tone indicates the emotional or conversational tone you want the AI to adopt in its response. It helps convey the desired attitude or style.
Example: "Maintain a polite and patient tone throughout the conversation."

The quality of the AI's response can be further refined using parameters like `top-p`, `top-k`, and `temperature`. These parameters influence the randomness and creativity of the generated text. The output format can also be specified (e.g., plain text or JSON).

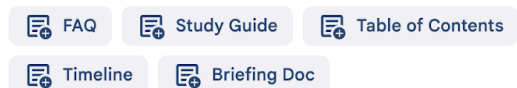## Activity 4: Creating a Personalized Study Guide with NotebookLM

Goals:
- To learn how to use NotebookLM to generate questions and answers from your own documents.
- To develop a podcast script based on the generated Q&A, focusing on key concepts.
- To create a concise and effective study guide summarizing the key information from your chosen document.

Instructions:
- Choose a Document: Select a document (e.g., a research paper, lecture notes, chapter from a textbook) that you would like to create a study guide for. The document should be in a readable format (e.g., .txt, .pdf, .docx).
- Upload to NotebookLM:
  - Visit notebooklm.com.
  - Click "Try NotebookLM".
  - Click "Create new".
  - Click "Choose file" and upload your chosen document.
  - Click "Generate". Allow the system sufficient time to process your document.
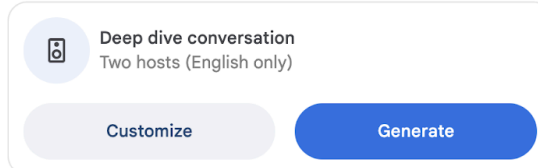
✳ Notebook guide

Help me create

| FAQ | Study Guide | Table of Contents |
| Timeline | Briefing Doc |

Audio Overview ⓘ

Deep dive conversation
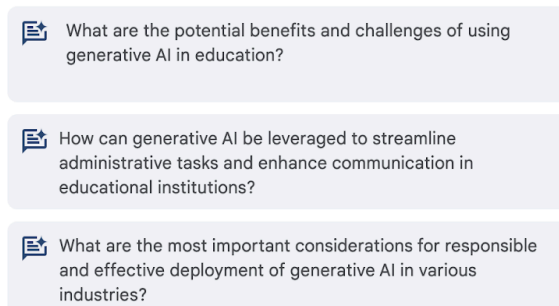Two hosts (English only)

Customize — Generate

Summary
This presentation, "Artificial intelligence in Executive Education Trends, challenges and opportunities," examines the use of generative AI in education. It begins by defining generative AI and outlining its different types, then explores its various applications in education, including content creation, accessibility enhancements, and administrative streamlining. The presentation also analyzes the opportunities and threats of leveraging generative AI, emphasizing the importance of data security, accuracy, and bias mitigation. The final section delves into the implementation strategies for utilizing generative AI within educational institutions.

Suggested questions

- What are the potential benefits and challenges of using generative AI in education?
- How can generative AI be leveraged to streamline administrative tasks and enhance communication in educational institutions?
- What are the most important considerations for responsible and effective deployment of generative AI in various industries?

Activity 5 : Apply learned AI techniques and prompt engineering best practices to analyze a business case study and propose solutions

Case Study: Custom Program Design Opportunities :
https://github.com/rihanamsaddek/AI-applications-lab/blob/main/Custom%20Program%20Design%20Opportunities%20case%202024_revised.doc
Instructions:
- Carefully read the provided case study document. Identify the key challenges, opportunities, and stakeholders involved.
- Select the most appropriate AI platform and model for this task. Consider the type of analysis required (e.g., summarization, idea generation, data extraction) and the document format. Justify your choice.
- Develop a series of prompts using the six components of effective prompting (Persona, Context, Task, Exemplar, Format, Tone) to guide your model.
- Experiment with different prompts to extract different types of insights and solutions.
  Examples:
    - Prompt 1 (Understanding the problem): "[Persona: Business consultant] [Context: Given this case study about custom program design] [Task: Summarize the key challenges and opportunities facing the organization.] [Format: Bulleted list] [Tone: Analytical]"
- Critically evaluate the AI-generated output. Refine your prompts and parameters as needed to improve the quality and relevance of the results.
- Summarize your analysis, chosen AI tool, prompting strategy, and proposed solutions in a clear and concise manner. Explain how the AI assisted you in this process.

Activity 6 : Use AI to improve an RFP response by rewriting specific sections leveraging the best practices you learned in prompt engineering and parameter tuning.

Documents:
Document 1 : This document is an Invitation to Tender (ITT) from the Westminster Foundation for Democracy (WFD) seeking a vendor to design and deliver an online course on parliamentary oversight and legislative scrutiny for around 40 participants in the Maldives.
https://github.com/rihanamsaddek/AI-applications-lab/blob/main/WFD%20ITT-Maldives-Online-Course.pdf

Document 2 : This document is a bid from McGill University's School of Continuing Studies (SCS) in response to the WFD's Invitation to Tender for an online course on parliamentary oversight and legislative scrutiny for stakeholders in the Maldives.
https://github.com/rihanamsaddek/AI-applications-lab/blob/main/McGill%20Proposal_WFD%20Maldives%20(Final_Rev._15Oct2021)%20(1).pdf

Instructions:
- Upload the two provided documents to Google AI Studio.
- Use the two prompts provided in the activity description (Prompt 1 and Prompt 2) within AI Studio. These prompts already incorporate the six components of effective prompting.
- Don't be afraid to modify the provided prompts or create new ones to address specific areas for improvement. Experiment with different parameters (temperature, top-p, etc.) to fine-tune the AI's output.
- Carefully review the AI-generated text. Does it effectively address the feedback and improve the overall quality of the RFP response? Ensure the AI-generated content is accurate, consistent with the original proposal, and reflects the desired tone and style.

Prompt 1 :
- [Persona]: You are an expert in online learning and pedagogical best practices.
- [Context]: You've been asked to review McGill's proposal and suggest improvements to the proposed learning activities and participant engagement strategies. The WFD is particularly interested in fostering collaboration and peer learning among participants.
- [Task]: Rewrite the 'Delivery Format' and 'Learning Outcomes' sections. Enhance the description of learning activities to emphasize interactivity, peer-to-peer engagement, and practical application of skills. Suggest specific online tools and techniques to foster a collaborative learning environment. Revise the learning outcomes to be more measurable and action-oriented, demonstrating the tangible impact of the course on participant skills and knowledge.
- [Exemplar]: "In addition to interactive Zoom sessions, participants will engage in collaborative online simulations, role-playing scenarios relevant to the Maldivian context, and peer feedback exercises using online platforms like [mention specific platforms]. This will allow them to practice oversight techniques in a safe and supportive environment. Upon completion of the course, participants will be able to conduct evidence-based policy analysis, develop effective stakeholder engagement strategies, and formulate targeted recommendations for improved oversight..."
- [Format]: Two revised sections: Delivery Format and Learning Outcomes.
- [Tone]: Engaging, innovative, and learner-centered.

Prompt 2 :
- [Persona]: You are a member of the WFD selection committee reviewing proposals.
- [Context]: You are concerned that the McGill response, while strong on experience, doesn't fully address the budget limitations and the need for a focus on smaller states mentioned in the ITT. You also want to see more evidence of how the course will practically enhance oversight capacity within the Majlis.
- [Task]: Rewrite the sections on 'Recommended Budget' and 'Course Content' to address these concerns. Explain how McGill will deliver a high-quality course within the specified budget range. Demonstrate the value for money and highlight any cost-effective strategies. For the 'Course Content,' provide more detail on the practical application of each module and how it will directly contribute to improving oversight effectiveness within the Maldivian parliament.
- [Exemplar]: "To maximize cost-effectiveness while delivering a high-quality learning experience, McGill will leverage existing online resources and adapt previously developed modules, reducing development costs. This allows us to offer the proposed course within the WFD's budget range of £27,000-£35,000. The module on 'Stakeholder Engagement' will provide practical guidance on how Majlis officials can effectively engage civil society and media in the oversight process, directly contributing to increased transparency and accountability within the Maldives..."
- [Format]: Two revised sections: Recommended Budget and Course Content.
- [Tone]: Reassuring, transparent, and value-focused.

Try This On Your Own RFP Application!