AI ANATOMY

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Presented by:
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Streamline Medical Workflows with NLP and AI

WHERE HEALTHCARE MEETS AUTOMATION

In a world overwhelmed by unstructured medical data, the real breakthrough isn't just in processing information—it's in understanding it. The fusion of Natural Language Processing and healthcare automation represents a shift from passive record-keeping to proactive, intelligent care.

The Power of Applied AI in Healthcare

By transforming clinical text into structured insights and immediate actions, we create systems that not only support physicians but also safeguard patients. This isn't just about automation—it's about amplifying empathy through technology.

What This Challenge Stands For

This 12-hour sprint is more than a coding task—it's a glimpse into the future of medicine, where AI acts as an ally in saving time, reducing errors, and improving outcomes.

Objective

Develop an AI-powered system to automate healthcare tasks by combining **Natural Language Processing (NLP)** and **actionable workflows**. Your solution should extract insights from medical text *and* trigger real-world actions to improve care delivery.

Project description

Your system should address two core components:

1. **Medical Intent Extraction**
   - Use NLP to analyze unstructured healthcare data (e.g., clinical notes, patient messages).
   - Extract key entities: symptoms, diagnoses, medications, urgency levels, or patient intents.
   - Generate structured outputs (e.g., JSON/CSV) for downstream use.
2. **Workflow Automation**
   - Convert NLP outputs into actionable steps (e.g., alerts, reminders, reports).

Bonus :

- Integration with Healthcare Systems: Simulate EHR/SMS integration using mock APIs (e.g., print a message like "Alert sent to EHR!") or basic scripts.
- Multimodal Inputs : Add support for images/voice .
- You can use a **graph model** (e.g., Neo4J) to map relationships between symptoms, treatments, or patient histories.

Technical components

NLP for Healthcare	Automation & Integration	Interface (Mandatory)**

• **Tools:** spaCy, Hugging Face Transformers, GPT-3.5/4, or rule-based systems.
• **Tasks:**
  ○ Classify text (e.g., "severe headache + vomiting" → **urgent**).
  ○ Extract entities from discharge summaries or prescriptions.
	• **Tools:** Python (Flask/FastAPI for mock APIs), PyAutoGUI, Twilio (SMS), or email libraries.
	• **Tasks:**
	  ○ Trigger alerts for critical cases.
	  ○ Generate patient-friendly summaries from medical jargon.
		• Showcase your work with a simple UI (e.g., Streamlit, Gradio) or a demo video.
		• Example: A dashboard displaying NLP outputs and triggered actions.

Use cases!

1. **Automated Triage System**
   - Analyze Emergency Room intake notes to prioritize patients (e.g., "chest pain" → cardiac alert).
2. **Medication Adherence Assistant**
   - Extract drug names/dosages from prescriptions and send reminders to patients.
3. **Mental Health Crisis Detector**
   - Flag high-risk phrases in patient journals (e.g., "I feel hopeless") and notify counselors.
4. **Clinical Report Generator**
   - Convert doctor's notes into structured reports.

Challenges:

- **Ambiguous Medical Language:** Resolve abbreviations (e.g., "CP" = chest pain vs. cerebral palsy).
- **Action Reliability:** Ensure error-free workflows (e.g., correct drug alerts).
- **Time Constraints:** Optimize for a 12-hour build!

Prerequesities:

- **Programming Language:** Python
- **Libraries:** NLP (spaCy, Transformers), Automation (PyAutoGUI, Twilio), UI (Streamlit).
- **Data:** Public datasets (MIMIC-III, i2b2) or synthetic medical text.

Evaluation criteria:

1. **Functionality**
   - Does the system solve a real healthcare problem?
   - Can it process 3+ test cases successfully?
2. **Technical Quality**
   - Clean code, efficient NLP pipeline, and scalable design.
3. **Impact & Creativity**
   - Potential to improve patient outcomes or clinician efficiency.

Submission requirements:

- Github link of your source code.
- A live UI showcase or a clear explanation.

Note that any advancement in your project will be taken into consideration, you should present your ideas even if they're incomplete

Should you have any questions, **contact our technical team**

join this discord link: Join the GDGoC Tunisia Discord Server!

"In the intersection of code and care, we build not just systems—but lifelines, where every line of text becomes a step toward healing."