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(.venv) karantomar@KARANs-MacBook-Pro Keystone_Redactor_Framework % python demo.py
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```

KEYSTONE REDACTOR FRAMEWORK DEMO

This demo will walk through the full, privacy-preserving workflow.

2025-11-12 14:15:17,453 - INFO - GeminiClient initialized successfully with hardcoded model:
models/gemini-2.5-flash

--- ORIGINAL TEXT ---

'Please schedule a call with Dr. Evelyn Reed for May 20, 2024. She is currently in Berlin. Her
contact email is e.reed@science-corp.net. The budget for the consultation is \$750.'

===== STAGE 1: PII DETECTION =====

Using PII Detector (spaCy + regex) to find sensitive data...

Original Text: 'Please schedule a call with Dr. Evelyn Reed for May 20, 2024. She is currently in
Berlin. Her contact email is e.reed@science-corp.net. The budget for the consultation is \$750.'

--> Detected PII Entities:

- Entity: 'Evelyn Reed', Label: PERSON, Indices: [32, 43]
- Entity: 'May 20, 2024', Label: DATE, Indices: [48, 60]
- Entity: 'Berlin', Label: GPE, Indices: [82, 88]
- Entity: 'e.reed@science-corp.net', Label: EMAIL, Indices: [111, 134]
- Entity: '750', Label: MONEY, Indices: [172, 175]

===== STAGE 2: PII REDACTION =====

Using Redactor to replace PII with placeholders...

===== Redaction Result =====

Original Text: 'Please schedule a call with Dr. Evelyn Reed for May 20, 2024. She is currently in
Berlin. Her contact email is e.reed@science-corp.net. The budget for the consultation is \$750.'

Redacted Text: 'Please schedule a call with Dr. [PERSON_A] for [DATE_A]. She is currently in
[GPE_A]. Her contact email is [EMAIL_A]. The budget for the consultation is \$[MONEY_A].'

Placeholder Map:

```
{ '[DATE_A]': 'May 20, 2024',  
  '[EMAIL_A]': 'e.reed@science-corp.net',  
  '[GPE_A]': 'Berlin',  
  '[MONEY_A]': '750',  
  '[PERSON_A]': 'Evelyn Reed'}
```

===== STAGE 3: SECURE LLM CALL =====

Sending the SAFE, REDACTED prompt to the Gemini LLM...

Prompt being sent: 'Please schedule a call with Dr. [PERSON_A] for [DATE_A]. She is currently in [GPE_A]. Her contact email is [EMAIL_A]. The budget for the consultation is \$[MONEY_A].'

--- LLM RESPONSE (contains only placeholders) ---

'Here are the key points:

- * A call needs to be scheduled with Dr. [PERSON_A] for [DATE_A].
 - * Dr. [PERSON_A] is currently in [GPE_A].
 - * Her contact email is [EMAIL_A].
 - * The budget for the consultation is \$[MONEY_A].'
- >>> Note: The LLM never saw the original names, dates, or emails. <<<

===== STAGE 4: PII RESTORATION =====

Using Restorer to de-redact the LLM's response...

2025-11-12 14:15:30,579 - INFO - Starting restoration process...

----- Restoration Analysis -----

Before Restoration (LLM Output):

'Here are the key points:

- * A call needs to be scheduled with Dr. [PERSON_A] for [DATE_A].
- * Dr. [PERSON_A] is currently in [GPE_A].
- * Her contact email is [EMAIL_A].
- * The budget for the consultation is \$[MONEY_A].'

2025-11-12 14:15:30,580 - INFO - Restoring '[MONEY_A]' -> '750'

2025-11-12 14:15:30,580 - INFO - Restoring '[EMAIL_A]' -> 'e.reed@science-corp.net'

2025-11-12 14:15:30,580 - INFO - Restoring '[GPE_A]' -> 'Berlin'

2025-11-12 14:15:30,580 - INFO - Restoring '[DATE_A]' -> 'May 20, 2024'

2025-11-12 14:15:30,580 - INFO - Restoring '[PERSON_A]' -> 'Evelyn Reed'

After Restoration (Final Text):

'Here are the key points:

- * A call needs to be scheduled with Dr. Evelyn Reed for May 20, 2024.
- * Dr. Evelyn Reed is currently in Berlin.
- * Her contact email is e.reed@science-corp.net.
- * The budget for the consultation is \$750.'

===== DEMO COMPLETE: FINAL OUTPUT =====

This is the final, human-readable text after re-inserting the PII.

The original data was protected throughout the entire process.

--- FINAL RESTORED TEXT ---

'Here are the key points:

- * A call needs to be scheduled with Dr. Evelyn Reed for May 20, 2024.

- * Dr. Evelyn Reed is currently in Berlin.
- * Her contact email is e.reed@science-corp.net.
- * The budget for the consultation is \$750.'

=====
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