**Background:**

Referring physicians frequently encounter the task of consolidating a wide range of medical data into detailed patient reports. This data typically includes patient histories, symptoms, vital signs, lab test results, and notes from specialists.

Our goal is to develop an AI solution that automates the generation of personalized medical reports by intelligently integrating specific patient information with a standard "Reference Report".

The AI system will be designed to:

1. Precisely interpret individual patient data, encompassing symptoms, vital signs, laboratory and test results, among other relevant information.
2. Intelligently merge this patient-specific data with a predefined reference report that outlines standard medical observations and findings typically expected in a healthy individual.
3. Produce a final report that modifies the reference report based on the input data, ensuring that the report is comprehensive, including all necessary patient-specific details while maintaining clarity and structure.

**Problem Statement:**

Given an input text (that contains patient details) and a “Reference Report” , develop an AI solution to automate patient report generation for a referring physician. Our AI needs to intelligently merge patient-specific data with the predefined reference report.

For this assignment, Reference Report remains same for all examples and is as below :

*Reference Report :*

*General health status is normal. No reported symptoms of acute illness.*

*Vital signs within normal ranges.*

*Allergies: None reported.*

*Immunizations up to date.*

*Recent laboratory tests (if any) fall within normal parameters.*

*No remarkable findings in the cardiovascular and respiratory system examination.*

*Gastrointestinal and neurological examinations show no abnormalities.*

Example 1:

Input Text

45 year old male ; complains of intermittent chest pain and shortness of breath. BP reads 140/90 ; cholesterol levels are high ; Slight irregularities are noted in ECG. Cardiologist suggests stress test, Chest Xray and recommends dietary changes.

Output Report

45-year-old male presenting with intermittent chest pain and shortness of breath.

Vital signs: Blood pressure slightly elevated at 140/90.

Allergies: None reported.

Immunizations up to date.

Laboratory tests indicate high cholesterol levels. ECG shows slight irregularities.

No remarkable findings in the cardiovascular and respiratory system examination.

Gastrointestinal and neurological examinations show no abnormalities.

Cardiologist suggests a stress test, Chest Xray and recommends dietary changes.

See how the input text is seamlessly integrated into the Reference Report to generate the output report.

The excel file (train.xlsx) contains few more training examples of input text and output report. “Reference Report” remains the same for all the examples. Your goal is to read train.xlsx and develop an AI to generate output report from input text.

You are free to use any available Machine Learning model/API/package to solve this problem. Feel free to make any assumptions if something is not clear. Your AI model will be tested against a hidden test set of input text for new patients.

Best of Luck !!

Edit : No hard deadline , but we would appreciate receiving your response within the next week so we can get started with the next steps.

You are a Physician, and your task is to consolidate a wide range of medical data into detailed patient reports. This data typically includes patient histories, symptoms, vital signs, lab test results, and notes from specialists. so another physician can under output report

Precisely saying :  
1. Precisely interpret individual patient data, encompassing symptoms, vital signs, laboratory and test results, among other relevant information.  
2. Intelligently merge this patient-specific data with a predefined reference report that outlines standard medical observations and findings typically expected in a healthy individual.  
3. Produce a final report that modifies the reference report based on the input data, ensuring that the report is comprehensive, including all necessary patient-specific details while maintaining clarity and structure.

 Following some Sample Text for I want output in this Format

###################Example Text and Output

Example Text 1 :

45-year-old male ; complains of intermittent chest pain and shortness of breath. BP reads 140/90 ; cholesterol levels are high ; Slight irregularities are noted in ECG. Cardiologist suggests stress test, Chest Xray and recommends dietary changes.

Output 1  :

 45-year-old male presenting with intermittent chest pain and shortness of breath.  
Vital signs: Blood pressure slightly elevated at 140/90.  
Allergies: None reported.  
Immunizations up to date.  
Laboratory tests indicate high cholesterol levels. ECG shows slight irregularities.  
No remarkable findings in the cardiovascular and respiratory system examination.  
Gastrointestinal and neurological examinations show no abnormalities.  
Cardiologist suggests a stress test, Chest Xray and recommends dietary changes

Example Text 2 :

52-year-old female; experiencing cough, fever, and difficulty breathing. BP reads 120/80; recent chest X-ray shows opacities consistent with COVID-19. Neurological exam reveals reduced reflexes and muscle weakness, suggestive of Guillain-Barré syndrome.Recommends COVID-19 treatment protocol and further neurological evaluation for Guillain-Barré syndrome.  
  
Output 2:

52-year-old female presenting with cough, fever, and difficulty breathing.  
Vital signs: Blood pressure normal at 120/80.  
Allergies: None reported.  
Immunizations up to date.  
Chest X-ray reveals opacities consistent with COVID-19 infection.  
Neurological examination indicates reduced reflexes and muscle weakness, suggestive of Guillain-Barré syndrome.  
Recommends COVID-19 treatment protocol and further neurological evaluation for Guillain-Barré syndrome.

Example Text 3:

60-year-old female; reports frequent headaches and blurred vision. BP reads 130/85; blood sugar levels slightly elevated. Ophthalmologist notes signs of early cataract formation. Advised to monitor blood sugar levels and schedule a follow-up for cataract assessment.

Output 3:

60-year-old female presenting with frequent headaches and blurred vision.  
Vital signs: Blood pressure slightly elevated at 130/85.  
Allergies: None reported.  
Immunizations up to date.  
Laboratory tests show slightly elevated blood sugar levels.  
No remarkable findings in the cardiovascular and respiratory system examination.  
Gastrointestinal and neurological examinations show no abnormalities.  
Ophthalmologist notes early signs of cataract formation.  
Advised to monitor blood sugar levels and schedule a follow-up for cataract assessment.

Example Text 4:

55-year-old male; experiencing persistent abdominal pain and weight loss. BP normal; recent endoscopy shows signs of gastric ulcer.Recommends gastrointestinal follow-up and potential treatment for ulcer.

Output 4:

55-year-old male with persistent abdominal pain and weight loss.  
Vital signs within normal ranges.  
Allergies: None reported.  
Immunizations up to date.  
Endoscopy reveals signs of a gastric ulcer.  
No remarkable findings in the cardiovascular and respiratory system examination.  
Neurological examination show no abnormalities.  
Recommends gastrointestinal follow-up and potential treatment for ulcer.

Example Text 5:

30-year-old female; complains of frequent urination and extreme thirst. History of diabetes in family. Blood sugar level is 200 mg/dL.Recommends further evaluation for diabetes management.

Output 5:

30-year-old female experiencing frequent urination and extreme thirst. History of diabetes in family.  
Vital signs within normal ranges.  
Allergies: None reported.  
Immunizations up to date.  
Blood sugar level significantly elevated at 200 mg/dL, suggesting possible diabetes.  
No remarkable findings in the cardiovascular and respiratory system examination.  
Gastrointestinal and neurological examinations show no abnormalities.  
Recommends further evaluation for diabetes management.

Example Text 6:

38-year-old female; reports joint pain and stiffness, particularly in the mornings. BP reads 125/80; blood tests indicate high rheumatoid factor levels. Rheumatologist suspects rheumatoid arthritis. recommends further evaluation and potential rheumatological treatment.

Output 6:

38-year-old female presenting with joint pain and stiffness, especially in the mornings.  
Vital signs: Blood pressure normal at 125/80.  
Allergies: None reported.  
Immunizations up to date.  
Blood tests show high rheumatoid factor levels.  
No remarkable findings in the cardiovascular and respiratory system examination.  
Gastrointestinal and neurological examinations show no abnormalities.  
Rheumatologist suspects rheumatoid arthritis; recommends further evaluation and potential rheumatological treatment.

Example Text 7:

43-year-old male; complains of chronic back pain and numbness in legs. BP reads 135/90; MRI of the spine shows disc herniation at L4-L5. Orthopedist recommends physical therapy and possible surgical consultation.

Output 7:

43-year-old male presenting with chronic back pain and leg numbness.  
Vital signs: Blood pressure slightly elevated at 135/90.  
Allergies: None reported.  
Immunizations up to date.  
MRI of the spine reveals disc herniation at L4-L5.  
No remarkable findings in the cardiovascular and respiratory system examination.  
Gastrointestinal examination show no abnormalities.  
Orthopedist recommends physical therapy and possible surgical evaluation.