

"""

- For each diagnosis, pull lab results,
- egfr
- for each diagnosis, pull lab ranges,
- pull ranges for diagnosis
- if the diagnosis is x, then the lab ranges should be a to b
- train the agents, increase the load of input
- medical history sent to the agent
- setup rag for the agents
- run the first agent -> kidney disease -> don't know the stage -> stage 2 -> lab results -> indicative of stage 3 -> the case got elevated ->
- how to manage diseases and by looking at correlating lab, docs, diagnoses
- put docs in rag ->
- monitoring, evaluation, and treatment
- can we confirm for every diagnosis -> monitoring, evaluation, and treatment, specialized for these things
- find diagnosis -> or have diagnosis, -> for each diagnosis are there evidence of those 3 things
- swarm of those 4 agents, ->
- fda api for healthcare for commercially available papers
-

"""

from datetime import datetime

```
from swarms import Agent, AgentRearrange, create_file_in_folder
```

```
chief_medical_officer = Agent(
```

```
    agent_name="Chief Medical Officer",
```

```
    system_prompt="""You are the Chief Medical Officer coordinating a team of medical specialists  
for viral disease diagnosis.
```

```
    Your responsibilities include:
```

- Gathering initial patient symptoms and medical history
- Coordinating with specialists to form differential diagnoses
- Synthesizing different specialist opinions into a cohesive diagnosis
- Ensuring all relevant symptoms and test results are considered
- Making final diagnostic recommendations
- Suggesting treatment plans based on team input
- Identifying when additional specialists need to be consulted
 - For each differential diagnosis provide minimum lab ranges to meet that diagnosis or be indicative of that diagnosis minimum and maximum

```
    Format all responses with clear sections for:
```

- Initial Assessment (include preliminary ICD-10 codes for symptoms)
- Differential Diagnoses (with corresponding ICD-10 codes)
- Specialist Consultations Needed
- Recommended Next Steps

```
    """,
```

```
    model_name="gpt-4o",
```

```
max_loops=1,  
)
```

```
virologist = Agent(  
    agent_name="Virologist",  
    system_prompt="""You are a specialist in viral diseases. For each case, provide:
```

Clinical Analysis:

- Detailed viral symptom analysis
- Disease progression timeline
- Risk factors and complications

Coding Requirements:

- List relevant ICD-10 codes for:
 - * Confirmed viral conditions
 - * Suspected viral conditions
 - * Associated symptoms
 - * Complications
- Include both:
 - * Primary diagnostic codes
 - * Secondary condition codes

Document all findings using proper medical coding standards and include rationale for code selection."""

```
model_name="gpt-4o",  
max_loops=1,
```

)

```
internist = Agent(  
    agent_name="Internist",  
    system_prompt="""You are an Internal Medicine specialist responsible for comprehensive  
evaluation.
```

For each case, provide:

Clinical Assessment:

- System-by-system review
- Vital signs analysis
- Comorbidity evaluation

Medical Coding:

- ICD-10 codes for:
 - * Primary conditions
 - * Secondary diagnoses
 - * Complications
 - * Chronic conditions
 - * Signs and symptoms
- Include hierarchical condition category (HCC) codes where applicable

Document supporting evidence for each code selected."""

```
model_name="gpt-4o",
```

```
max_loops=1,
```

)

```
medical_coder = Agent(  
    agent_name="Medical Coder",  
    system_prompt="""You are a certified medical coder responsible for:
```

Primary Tasks:

1. Reviewing all clinical documentation
2. Assigning accurate ICD-10 codes
3. Ensuring coding compliance
4. Documenting code justification

Coding Process:

- Review all specialist inputs
- Identify primary and secondary diagnoses
- Assign appropriate ICD-10 codes
- Document supporting evidence
- Note any coding queries

Output Format:

1. Primary Diagnosis Codes
 - ICD-10 code
 - Description
 - Supporting documentation
2. Secondary Diagnosis Codes
 - Listed in order of clinical significance

3. Symptom Codes

4. Complication Codes

5. Coding Notes""",

model_name="gpt-4o",

max_loops=1,

)

synthesizer = Agent(

agent_name="Diagnostic Synthesizer",

system_prompt="""You are responsible for creating the final diagnostic and coding assessment.

Synthesis Requirements:

1. Integrate all specialist findings
2. Reconcile any conflicting diagnoses
3. Verify coding accuracy and completeness

Final Report Sections:

1. Clinical Summary

- Primary diagnosis with ICD-10
- Secondary diagnoses with ICD-10
- Supporting evidence

2. Coding Summary

- Complete code list with descriptions
- Code hierarchy and relationships
- Supporting documentation

3. Recommendations

- Additional testing needed
- Follow-up care
- Documentation improvements needed

```
Include confidence levels and evidence quality for all diagnoses and codes.""",  
model_name="gpt-4o",  
max_loops=1,  
)
```

```
# Create agent list
```

```
agents = [  
    chief_medical_officer,  
    virologist,  
    internist,  
    medical_coder,  
    synthesizer,  
]
```

```
# Define diagnostic flow
```

```
flow = f"""{chief_medical_officer.agent_name} -> {virologist.agent_name} -> {internist.agent_name}  
-> {medical_coder.agent_name} -> {synthesizer.agent_name}"""
```

```
# Create the swarm system
```

```
diagnosis_system = AgentRearrange(  
    name="Medical-coding-diagnosis-swarm",  
    description="Comprehensive medical diagnosis and coding system",
```

```
agents=agents,  
flow=flow,  
max_loops=1,  
output_type="all",  
)
```

```
def generate_coding_report(diagnosis_output: str) -> str:
```

```
    """
```

```
    Generate a structured medical coding report from the diagnosis output.
```

```
    """
```

```
    timestamp = datetime.now().strftime("%Y-%m-%d %H:%M:%S")
```

```
    report = f"""# Medical Diagnosis and Coding Report
```

```
    Generated: {timestamp}
```

```
    ## Clinical Summary
```

```
    {diagnosis_output}
```

```
    ## Coding Summary
```

```
    ### Primary Diagnosis Codes
```

```
    [Extracted from synthesis]
```

```
    ### Secondary Diagnosis Codes
```

```
    [Extracted from synthesis]
```


Symptom Codes

[Extracted from synthesis]

Procedure Codes (if applicable)

[Extracted from synthesis]

Documentation and Compliance Notes

- Code justification
- Supporting documentation references
- Any coding queries or clarifications needed

Recommendations

- Additional documentation needed
- Suggested follow-up
- Coding optimization opportunities

"""

return report

if __name__ == "__main__":

Example patient case

patient_case = ""

Patient: 45-year-old White Male

Lab Results:

- egfr

- 59 ml / min / 1.73

- non african-american

"""

Add timestamp to the patient case

case_info = f"Timestamp: {datetime.now()}\nPatient Information: {patient_case}"

Run the diagnostic process

diagnosis = diagnosis_system.run(case_info)

Generate coding report

coding_report = generate_coding_report(diagnosis)

Create reports

create_file_in_folder(

 "reports", "medical_diagnosis_report.md", diagnosis

)

create_file_in_folder(

 "reports", "medical_coding_report.md", coding_report

)