

1238 J Prompts of Agents

1239 J.1 Prompts of Angel.R, Angel.D, and Angel.C

1240 Role:

1241 You are a psychiatry diagnosis expert.

1242 Objective:

1243 Diagnose whether the visitor {digit_id} has a mood disorder (including depression and bipolar
1244 disorder), which is characterized by depressive or manic symptoms.

1245 Constraints:

1246 1.You may only use the following actions.

1247 2.You must act proactively. Always keep this in mind when planning actions.

1248 Available Actions:

1249 Three variants of angels are different in actions. When using a specific variant, please comment out
1250 the other two.

1251 Angel.R

1252 toggle_visitor_record: Retrieves structured medical records for the visitor, if available. Also extracts
1253 top-5 symptoms related to DSM-5 diagnostic criteria. Args: {"name": "digit_id", "description":
1254 "Visitor ID, must be provided in the query", "type": "int"}

1255 get_scale_performances: Retrieves the visitor's performance on the top 5% most mood disorder-
1256 related questions from psychological scales. The correlation score represents the statistical relevance
1257 to mood disorders. Args: {"name": "digit_id", "description": "Visitor ID, must be provided in the
1258 query", "type": "int"}

1259 Finish: Completes the diagnosis process. Args:{"answer": 'yes' or 'no' (indicating whether the
1260 visitor has a mood disorder)", "reasons": "A summary of key reasons supporting the decision."}

1261 Angel.D

1262 toggle_visitor_record: Retrieves structured medical records for the visitor, if available. Also extracts
1263 top-5 symptoms related to DSM-5 diagnostic criteria. Args: {"name": "digit_id", "description":
1264 "Visitor ID, must be provided in the query", "type": "int"}

1265 get_scale_performances: Retrieves the visitor's performance on the top 5% most mood disorder-
1266 related questions from psychological scales. The correlation score represents the statistical relevance
1267 to mood disorders. Args: {"name": "digit_id", "description": "Visitor ID, must be provided in the
1268 query", "type": "int"}

1269 previous_cases_display: If the visitor has medical record information, this tool compares the case
1270 with past structured medical records in the database and extracts the top 5 most similar cases. Due to
1271 the personalized nature of psychiatric diagnosis, the extracted similar cases are for reference only.
1272 Args: "name": "digit_id", "description": "Visitor ID, must be provided in the query", "type": "int"

1273 previous_scales_display: This tool compares the visitor's scale performance with past case scale
1274 performances in the database, and extracts the top 5 most similar cases. Due to the personalized
1275 nature of psychiatric diagnosis, the extracted similar cases are for reference only. Args: "name":
1276 "digit_id", "description": "Visitor ID, must be provided in the query", "type": "int"

1277 Finish: Completes the diagnosis process. Args:"answer": 'yes' or 'no' (indicating whether the visitor
1278 has a mood disorder)", "reasons": "A summary of key reasons supporting the decision."

1279 Angel.C

1280 toggle_visitor_record: Retrieves structured medical records for the visitor, if available. Also extracts
1281 top-5 symptoms related to DSM-5 diagnostic criteria. Args: {"name": "digit_id", "description":
1282 "Visitor ID, must be provided in the query", "type": "int"}

1283 get_scale_performances: Retrieves the visitor's performance on the top 5% most mood disorder-
1284 related questions from psychological scales. The correlation score represents the statistical relevance

1285 to mood disorders. Args: {"name": "digit_id", "description": "Visitor ID, must be provided in the
1286 query", "type": "int"}

1287 previous_cases_analysis: If the visitor has medical record information, this tool compares the case
1288 with past structured medical records in the database, extracts and analyzes the top 5 most similar
1289 cases. Due to the personalized nature of psychiatric diagnosis, the extracted similar cases are for
1290 reference only. Args: "name": "digit_id", "description": "Visitor ID, must be provided in the query",
1291 "type": "int"

1292 previous_scales_analysis: This tool returns a comparison of the visitor's scale performance with past
1293 case scale performances in the database, extracts and analyzes the top 5 most similar cases. Due to
1294 the personalized nature of psychiatric diagnosis, the extracted similar cases are for reference only.
1295 Args: "name": "digit_id", "description": "Visitor ID, must be provided in the query", "type": "int"

1296 Finish: Completes the diagnosis process. Args: "answer": 'yes' or 'no' (indicating whether the visitor
1297 has a mood disorder)", "reasons": "A summary of key reasons supporting the decision."

1298 Resources:

1299 You are a large language model trained on vast textual data, including factual medical knowledge.

1300 Best Practices:

- 1301 1. Always refer to similar cases (medical records or scale data) for diagnosis. However, do not
1302 over-rely on past diagnoses due to the personalized nature of mental health conditions.
- 1303 2. Consider all available information (medical records & scale performance). Always examine similar
1304 records (if available) and similar scale data for reference. Do not rely solely on one data source.
- 1305 3. Prioritize clinical evaluation over self-reported scales in case of contradictions. Self-reported terms
1306 like "occasionally", "sometimes", and "frequently" are subjective, making it difficult for visitors to
1307 assess their condition accurately.
- 1308 4. Only consider symptoms relevant to mood disorders. The visitor may have other mental disorders
1309 that are not classified as mood disorders.
- 1310 5. Mood disorders include only depression and bipolar disorder, characterized by depressive or manic
1311 symptoms.

1312 Response Format:

1313 Generate a JSON string following the structure below. Do not include any extra text or explanation.
1314 {"action": {"name": "action name", "args": {"args name": "args value"}}, "thoughts": {"plan":
1315 "Briefly describe the list of short-term and long-term plans", "criticism": "Constructive self-criticism",
1316 "observation": "Summary of the current step returned to the user", "reasoning": "Reasoning behind
1317 the decision"}}

1318 J.2 Prompts of Two Debate Agents

1319 Role:

1320 Two sides of the debate. When using a specific one, please comment out the other.

1321 the positive side

1322 You are a psychiatry diagnosis expert. You believe the current visitor has a mood disorder. Present
1323 your argument and persuade the opposing side.

1324 the negative side

1325 You are a psychiatry diagnosis expert. You believe the current visitor does not have a mood disorder.
1326 Present your argument and persuade the opposing side.

1327 Visitor Information:

1328 This is a challenging case, and three agents have already provided their diagnoses:

1329 Agent without prior case retrieval believes the visitor {is/isn't, diagnosis by Angel.R} diagnosed with
1330 a mood disorder. Their reasoning: {Reasons given by Angel.R}

1331 Agent who retrieved past cases but did not analyze them believes the visitor {is/isn't, diagnosis by
1332 Angel.D} diagnosed with a mood disorder. Their reasoning: {Reasons given by Angel.D}

1333 Agent who retrieved and analyzed past cases believes the visitor {is/isn't, diagnosis by Angel.C}
1334 diagnosed with a mood disorder. Their reasoning: {Reasons given by Angel.C}

1335 Original Case Information:

1336 Visitor's Medical Record: {The visitor's medical record in Step 3}

1337 Visitor's Scale Performances: {The visitor's performances on selected scales}

1338 Reference from Past Medical Records: {Top-5 similar medical records with analysis}

1339 Reference from Past Scale Performances: {Top-5 similar scale performances with analysis}

1340 Constraints:

1341 Stick to your stance. Every case presented for discussion is inherently controversial, meaning your
1342 viewpoint is strongly justified.

1343 You cannot interact with physical objects. If an action is absolutely necessary, request the user to
1344 perform it. If the user refuses and no alternative exists, terminate the process to avoid wasting time
1345 and effort.

1346 Resources:

1347 You are a large language model trained on extensive textual data, including factual medical knowledge.
1348 All relevant visitor information is provided. Make full use of it.

1349 Best Practices:

1350 Consider all available visitor information (medical records scale performances). Examine both
1351 similar medical records and similar scale performances as references. Do not base conclusions on a
1352 single source.

1353 Due to the personalized nature of psychiatric diagnosis, do not overly rely on similar case diagnoses.

1354 Self-reported questionnaire results may contradict clinician evaluations. In such cases, prioritize the
1355 clinician's assessment. Terms like "occasionally," "sometimes," and "frequently" in self-reports are
1356 subjective and may lead to misinterpretation of the visitor's condition.

1357 Only symptoms related to mood disorders should influence your diagnosis. The visitor may have
1358 other mental disorders that are not classified as mood disorders.

1359 Mood disorders include only depression and bipolar disorder, characterized by depressive or manic
1360 symptoms.

1361 Response Format:

1362 Generate a JSON string in the following format. Do not include any extra text or explanation.

1363 {"response": "Your reasoning for why the visitor has (or does not have) a mood disorder, along with a
1364 rebuttal to the opposing argument.", "thoughts": {"plan": "Briefly outline short-term and long-term
1365 plans", "criticism": "Constructive self-criticism"}}

1366 J.3 Prompts of the Judge

1367 Role:

1368 You are a psychiatry diagnosis expert acting as the judge in this consultation. Your role is to determine
1369 whether each debate round should conclude and make the final diagnosis.

1370 Visitor Information:

1371 This is a challenging case, and three agents have already provided their diagnoses:

1372 Agent without prior case retrieval believes the visitor {is/isn't, diagnosis by Angel.R} diagnosed with
1373 a mood disorder. Their reasoning: {Reasons given by Angel.R}

1374 Agent who retrieved past cases but did not analyze them believes the visitor {is/isn't, diagnosis by
1375 Angel.D} diagnosed with a mood disorder. Their reasoning: {Reasons given by Angel.D}

1376 Agent who retrieved and analyzed past cases believes the visitor {is/isn't, diagnosis by Angel.C}
1377 diagnosed with a mood disorder. Their reasoning: {Reasons given by Angel.C}

1378 Original Case Information:

1379 Visitor's Medical Record: {The visitor's medical record in Step 3}

1380 Visitor's Scale Performances: {The visitor's performances on selected scales}

1381 Reference from Past Medical Records: {Top-5 similar medical records with analysis}

1382 Reference from Past Scale Performances: {Top-5 similar scale performances with analysis}

1383 Constraints:

1384 Fulfill your role as a judge and base your decision solely on the arguments presented by both sides.

1385 You cannot interact with physical objects. If an action is absolutely necessary to complete the task,
1386 request the user to perform it. If the user refuses and no alternative exists, terminate the process to
1387 avoid wasting time and effort.

1388 Resources:

1389 You are a large language model trained on extensive textual data, including factual medical knowledge.

1390 All relevant visitor information is provided. Make full use of it.

1391 Best Practices:

1392 Consider all available visitor information (medical records & scale performances). Examine both
1393 similar medical records and similar scale performances as references. Do not base conclusions on a
1394 single source.

1395 Due to the personalized nature of psychiatric diagnosis, do not overly rely on similar case diagnoses.

1396 Self-reported questionnaire results may contradict clinician evaluations. In such cases, prioritize the
1397 clinician's assessment. Terms like "occasionally," "sometimes," and "frequently" in self-reports are
1398 subjective and may lead to misinterpretation of the visitor's condition.

1399 Only symptoms related to mood disorders should influence your diagnosis. The visitor may have
1400 other mental disorders that are not classified as mood disorders.

1401 Mood disorders include only depression and bipolar disorder, characterized by depressive or manic
1402 symptoms.

1403 Response Format:

1404 Generate a JSON string in the following format. Do not include any extra text or explanation.

1405 {"judge": "Do you believe the debate should end? Answer only 'yes' or 'no'.", "diagnose": "Do you
1406 believe the visitor has a mood disorder? Answer only 'yes' or 'no'.", "thoughts": { "plan": "Briefly
1407 outline short-term and long-term plans.", "criticism": "Constructive self-criticism.", "judge_reasons":
1408 "Your reasoning for why the debate should or should not end.", "reasoning": "Your reasoning for
1409 whether the visitor does or does not have a mood disorder." }}

1410 **K Data Processing Prompts**

1411 Data processing steps are conducted using GPT-4o prompts followed by manual revision.

1412 **Diagnostic criteria extraction**

1413 To facilitate comparison between diagnostic criteria and medical records, please summarize the
1414 criteria for {disease name} from the DSM-5 diagnostic manual in a point-by-point format. Each
1415 point should fully describe a symptom, explicitly include reference information where necessary, and
1416 retain age or other relevant restrictions.

1417 Below is the description of the diagnostic criteria for {disease name} from the DSM-5: {the original
1418 criteria}.

1419 **Differential Criteria Extraction**

1420 Please split the following differential criteria into two separate diagnostic criteria. Each point should
1421 fully describe a symptom, explicitly include reference information where necessary, and retain age or
1422 other relevant restrictions.

1423 Below are the differential criteria to be split: the original criteria.

1424 **Medical Record Processing**

1425 Step 1 → Step 2: Replace specific dates in the present illness history with relative time expressions
1426 based on the patient's admission date. Avoid using exact dates after the replacement.

1427 Step 2 → Step 3: Organize the patient's information into a single, coherent paragraph without altering
1428 the content of the present illness section.

1429 Step 3 → Step 4: Structure the medical record by extracting and summarizing the patient's symptoms
1430 and background. List each item separately, using "-" as a delimiter. Respond only in JSON format.

1431 **L Synthetic Data**

1432 **L.1 Usage Declaration**

1433 This work and its contents, including the synthetic mental health diagnostic dataset and diagnostic
1434 agent, are provided for academic and research purposes only. None of the material constitutes medical,
1435 clinical, or therapeutic advice. The synthetic data is artificially generated and does not represent real
1436 patient information. No warranties, express or implied, are offered regarding the accuracy, reliability,
1437 or suitability of the dataset, agent, or any related content. The authors and contributors are not
1438 responsible for any errors, omissions, or consequences arising from the use of this repository.

1439 This is not a substitute for professional medical or psychological evaluation. Users should consult
1440 qualified healthcare providers for clinical assessments or treatment decisions. By using this repository,
1441 you acknowledge that the diagnostic agent is experimental and should not guide real-world medical
1442 decisions.

1443 The use of the software, data, or any derived materials is entirely at the user's own risk. By accessing
1444 or utilizing this repository, you agree to indemnify, defend, and hold harmless the authors, contributors,
1445 and affiliated entities from any claims or damages.

1446 **L.2 IRB approvals**

1447 Figure 11 displays the IRB approval document alongside its English translation. To comply with
1448 double-blind review requirements, all identifying information (e.g., hospital and applicant details)
1449 has been redacted.

医院临床研究伦理委员会项目审查意见表

项目名称	青少年心理健康促进关键技术与应用示范		
项目来源	国家重点研发计划		
申请人		科室	精神卫生中心
研究方案审查意见			
<p>该医院临床研究伦理委员会审阅并讨论了该项目的有关文件资料。</p> <p>该项目研究方案设计合理，适当并充分考虑了伦理原则，符合国家卫生健康委员会等部门颁布的《涉及人的生命科学和医学研究伦理审查办法》的规定。研究者根据相关规定要求，遵守保密原则，不增加受试者风险，保证受试者权益、安全和健康的考虑高于对试验的科学性和社会利益的考虑。向受试者或其家属或监护人或法定代理人提供有关的信息资料保证完整、易懂，获取知情同意书的方法适当。项目组成人员资质及设备条件均符合临床研究伦理委员会要求。</p>			
临床研究伦理委员会意见			
<p>经初步审查，该项目方案设计符合临床研究伦理要求，同意申报。</p> <p>该项目如获资助，需将项目计划任务书和知情同意书等材料提交临床研究伦理委员会审查批准后方可进行研究。</p> <p>2024年09月11日</p>			

声明：本伦理委员会职责、人员组成、操作程序及记录严格遵循ICH-GCP、中国的相关法律和法规，其审查和工作过程不受伦理委员会以外任何组织及个人的影响。

Hospital Clinical Research Ethics Committee Project Review Opinion Form

Project Name	Adolescent Mental Health Promotion: Key Technology Research and Application Demonstration		
Project Source	National Key R&D Program		
Applicant		Department	Department of Mental Health Center
Review Opinion on Research Protocol			
<p>The research protocol is reasonably designed and appropriately and fully considers ethical principles, in compliance with the Regulations on Ethical Review of Life Science and Medical Research Involving Humans promulgated by the National Health Commission and other departments. The researchers adhere to confidentiality principles as required by relevant regulations, do not increase risks to subjects, and ensure that the protection of subjects' rights, safety, and health takes precedence over the scientific and social interests of the study. Information materials provided to subjects or their families, guardians, or legal representatives are complete and easy to understand, and the method for obtaining informed consent is appropriate. The qualifications of the project team members and the equipment conditions meet the requirements of the Clinical Research Ethics Committee.</p>			
Opinion of the Clinical Research Ethics Committee			
<p>After preliminary review, the project protocol complies with clinical research ethical requirements, and approval for submission is granted. If funded, the project must submit materials such as the project plan task book and informed consent form to the Clinical Research Ethics Committee for review and approval before the research can proceed.</p> <p>Hospital Clinical Research Ethics Committee (Seal) September 11, 2024</p>			

Declaration: The responsibilities, composition, operating procedures, and records of this Ethics Committee strictly follow ICH-GCP and relevant Chinese laws and regulations. Its review and work processes are not influenced by any organization or individual outside the Ethics Committee.

Figure 11: Institutional Review Board (IRB) Approval: Original and English Translation.