AI ASSISTED CODING

END LAB EXAM

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SET - 01

Q1. Improve prompt clarity for generating a course-creation module

TASK 1 : Rewrite a vague prompt into a structured prompt using role, constraints,
and output format**.**

PROMPT :

You are an instructional designer specializing in artificial intelligence and software engineering education.

Task: Create a beginner-friendly course module on AI-assisted coding.

Constraints:

- Focus only on fundamentals (AI-assisted IDEs, code completion, debugging, secure coding practices).

- Keep explanations concise (max 150 words per section).

- Include at least one Python example per topic.

Output Format:

- Title of module

- Learning objectives (3–5 bullet points)

- Content sections (with explanation + example code)

- Short quiz (3 multiple-choice questions with answers)

CODE :

```
finallabq1t1.py > ...
1    def generate_ai_course_module():
2        return {
3            "title": "Introduction to AI-Assisted Coding",
4            "objectives": [
5                "Understand AI in coding",
6                "Use AI for code completion",
7                "Debug with AI tools",
8                "Apply secure coding practices"
9            ],
10           "sections": {
11               "AI-Assisted IDEs": {
12                   "explanation": "Modern IDEs integrate AI to suggest code and detect errors.",
13                   "example": "import math\nprint(math.sqrt(16))"
14               },
15               "Code Completion": {
16                   "explanation": "AI predicts the next line of code to reduce errors.",
17                   "example": "for i in range(3):\n    print(i)"
18               }
19           },
20           "quiz": [
21               {"question": "Which feature predicts next line?", "answer": "Code Completion"},
22               {"question": "AI-assisted IDEs improve?", "answer": "Productivity"},
23               {"question": "AI tools identify?", "answer": "Both syntax & security issues"}
24           ]
25       }
26
27   print(generate_ai_course_module())
28
```

OUTPUT :

```
{'title': 'Introduction to AI-Assisted Coding', 'objectives': ['Understand AI in coding', 'Use AI
 for code completion', 'Debug with AI tools', 'Apply secure coding practices'], 'sections': {'AI-
Assisted IDEs': {'explanation': 'Modern IDEs integrate AI to suggest code and detect errors.', 'e
xample': 'import math\nprint(math.sqrt(16))'}, 'Code Completion': {'explanation': 'AI predicts th
e next line of code to reduce errors.', 'example': 'for i in range(3):\n    print(i)'}}, 'quiz':
[{'question': 'Which feature predicts next line?', 'answer': 'Code Completion'}, {'question': 'AI
-assisted IDEs improve?', 'answer': 'Productivity'}, {'question': 'AI tools identify?', 'answer':
 'Both syntax & security issues'}]}
```

OBSERVATION :

- The vague prompt is now **clear and structured**.
- The code produces a **consistent module format**.
- The output is **small, readable, and reusable**.
- You can extend this template for more topics (debugging, secure coding, etc.).

TASK 2 : Apply few-shot examples to improve AI's code output consistency.

PROMPT :

You are an instructional designer specializing in artificial intelligence and software engineering education.

Task: Generate a beginner-friendly course module on AI-assisted coding.

Constraints:

- Focus on fundamentals (AI-assisted IDEs, code completion, debugging, secure coding practices).

- Keep explanations concise (max 100 words per section).

- Include at least one Python example per topic.

- Output must follow the same structure as the examples provided.

Few-Shot Examples:

Example 1:

Title: Introduction to Python Basics

Objectives: ["Understand variables", "Use loops", "Define functions"]

Sections: {"Variables": {"explanation": "Variables store data", "example": "x=5"}}

Quiz: [{"question": "Which keyword defines a function?", "answer": "def"}]

Example 2:

Title: Networking Fundamentals

Objectives: ["Understand TCP/IP", "Differentiate UDP vs TCP"]

Sections: {"TCP": {"explanation": "Reliable protocol", "example": "3-way handshake"}}

Quiz: [{"question": "Which protocol is connectionless?", "answer": "UDP"}]

Now generate a similar module for AI-assisted coding.

CODE :

```
finallabq1t2.py > ...
1   def generate_ml_course_module():
2       # Few-shot examples guiding structure
3       examples = [
4           {
5               "title": "Introduction to Python Basics",
6               "objectives": ["Understand variables", "Use loops", "Define functions"],
7               "sections": {
8                   "Variables": {"explanation": "Variables store data", "example": "x = 5"}
9               },
10              "quiz": [{"question": "Which keyword defines a function?", "answer": "def"}]
11          },
12          {
13              "title": "Networking Fundamentals",
14              "objectives": ["Understand TCP/IP", "Differentiate UDP vs TCP"],
15              "sections": {
16                  "TCP": {"explanation": "Reliable protocol", "example": "3-way handshake"}
17              },
18              "quiz": [{"question": "Which protocol is connectionless?", "answer": "UDP"}]
19          }
20      ]
21
22      # Target module (Machine Learning Basics)
23      module = {
24          "title": "Introduction to Machine Learning Basics",
25          "objectives": [
26              "Understand supervised vs unsupervised learning",
27              "Explore datasets and preprocessing",
28              "Train a simple ML model",
29              "Evaluate model accuracy"
30          ],
31          "sections": {
32              "Supervised Learning": {
33                  "explanation": "Uses labeled data to train models.",
34                  "example": "from sklearn.linear_model import LinearRegression\nmodel = LinearRegression()"
35              },
36              "Unsupervised Learning": {
37                  "explanation": "Finds hidden patterns in unlabeled data.",
38                  "example": "from sklearn.cluster import KMeans\nkmeans = KMeans(n_clusters=3)"
39              }
40          },
41          "quiz": [
42              {"question": "Which learning uses labeled data?", "answer": "Supervised Learning"},
43              {"question": "Which algorithm is used for clustering?", "answer": "KMeans"},
44              {"question": "What metric evaluates accuracy?", "answer": "Score/Accuracy"}
45          ]
46      }
47
48      return module
49
50  print(generate_ml_course_module())
```

OUTPUT :

```
{'title': 'Introduction to Machine Learning Basics', 'objectives': ['Understand supervised vs uns
upervised learning', 'Explore datasets and preprocessing', 'Train a simple ML model', 'Evaluate m
odel accuracy'], 'sections': {'Supervised Learning': {'explanation': 'Uses labeled data to train
models.', 'example': 'from sklearn.linear_model import LinearRegression\nmodel = LinearRegression
()'}, 'Unsupervised Learning': {'explanation': 'Finds hidden patterns in unlabeled data.', 'examp
le': 'from sklearn.cluster import KMeans\nkmeans = KMeans(n_clusters=3)'}}, 'quiz': [{'question':
 'Which learning uses labeled data?', 'answer': 'Supervised Learning'}, {'question': 'Which algor
ithm is used for clustering?', 'answer': 'KMeans'}, {'question': 'What metric evaluates accuracy?
', 'answer': 'Score/Accuracy'}]]
```

OBSERVATION :

- By **providing few-shot examples**, the AI learns the **expected structure** (title → objectives → sections → quiz).

- This improves **consistency** across different modules, avoiding random formats.

- The output is **aligned with the examples**, making it predictable and reusable.

- You can extend this technique to generate multiple modules across subjects while keeping the same format.

Q2. Generate an AI-assisted LMS dashboard

TASK 1 : Use zero-shot prompting to generate HTML/CSS for faculty dashboard.

PROMPT :

Generate a clean, accessible, responsive HTML/CSS page for an AI-assisted LMS Faculty Dashboard.

Requirements:

- Top navbar with logo, course selector, search, user menu.

- Left sidebar with sections: Overview, Courses, Assignments, Gradebook, Attendance, Messages, Analytics, Settings.

- Main area with 3 cards: Today's Tasks, Grading Queue, Messages; plus a table of "Active Courses" with columns: Course, Enrollments, Pending Grades, Next Due, Actions.

- AI-assist features: a compact "Quick Actions" panel with buttons (Draft announcement, Generate rubric, Summarize messages) and a small prompt input.

- Use semantic HTML, mobile-first responsive design, CSS variables, light theme, and accessible contrast.

- No JavaScript; pure HTML/CSS. Keep it under ~300 lines. Include minimal icons using text/emoji only.

Output format: single HTML file with embedded <style>.

CODE :

```
<> finallabq2t1.html > ...
  1    <!doctype html>
  2    <html lang="en">
  3    <head>
  4      <meta charset="utf-8">
  5      <title>AI-Assisted LMS — Faculty Dashboard</title>
  6      <meta name="viewport" content="width=device-width, initial-scale=1">
  7      <link href="styles.css" rel="stylesheet">
  8    </head>
  9    <body>
 10      <header aria-label="Top navigation">
 11        <div class="logo">🎓 AI-Assisted LMS</div>
 12        <div class="nav-flex" role="navigation">
 13          <select class="select" aria-label="Select course">
 14            <option>CS101 — Intro to Programming</option>
 15            <option>CS220 — Data Structures</option>
 16            <option>CS340 — AI Systems</option>
 17          </select>
 18          <div class="search" role="search">
 19            <span aria-hidden="true">🔍</span>
 20            <input type="search" placeholder="Search students, assignments, messages…" aria-label="Search dashboard">
 21          </div>
 22        </div>
 23        <div class="user" aria-label="User menu">👩 Neha • Faculty</div>
 24      </header>
 25
 26      <div class="layout" role="main">
 27        <aside aria-label="Sidebar">
 28          <nav>
```

```html
        <ul class="menu">
          <li><a class="active" href="#">🏠 Overview</a></li>
          <li><a href="#">📕 Courses</a></li>
          <li><a href="#">📝 Assignments</a></li>
          <li><a href="#">📊 Gradebook</a></li>
          <li><a href="#">📍 Attendance</a></li>
          <li><a href="#">📧 Messages</a></li>
          <li><a href="#">📈 Analytics</a></li>
          <li><a href="#">⚙️ Settings</a></li>
        </ul>
      </nav>
    </aside>

    <main>
      <section class="grid" aria-label="Summary cards">
        <div class="card" aria-live="polite">
          <h3>Today's tasks</h3>
          <ul class="tasks" aria-label="Task list">
            <li><span>Finalize Lab 3 rubric</span><span class="badge">Due 5pm</span></li>
            <li><span>Schedule office hours</span><span class="badge">Tue</span></li>
            <li><span>Post project brief</span><span class="badge">Draft</span></li>
          </ul>
        </div>
        <div class="card">
          <h3>Grading queue</h3>
          <p class="muted">12 submissions need review • Last updated 10m ago</p>
          <div class="actions">
            <button class="btn primary">Open gradebook</button>
            <button class="btn">Export CSV</button>
          </div>
        </div>
        <div class="card">
          <h3>Messages</h3>
          <p class="muted">3 unread from CS220</p>
          <div class="actions">
            <button class="btn">View inbox</button>
            <button class="btn accent">Summarize</button>
          </div>
        </div>
      </section>

      <section class="card" aria-label="AI quick actions">
        <h3>AI quick actions</h3>
        <div class="quick">
          <button class="btn accent">📝 Draft announcement</button>
          <button class="btn warn">🧩 Generate rubric</button>
          <button class="btn">📧 Summarize messages</button>
```

```html
      <button class="btn">▦ Suggest schedule</button>
      <div class="prompt">
        <label for="prompt" class="muted">Prompt the assistant</label>
        <textarea id="prompt" placeholder="e.g., Create a rubric for Lab 3 focusing on clarity, correctness, and efficiency."></textarea>
      </div>
    </div>
  </section>

  <section class="table" aria-label="Active courses">
    <table>
      <thead>
        <tr>
          <th scope="col">Course</th>
          <th scope="col">Enrollments</th>
          <th scope="col">Pending grades</th>
          <th scope="col">Next due</th>
          <th scope="col">Actions</th>
        </tr>
      </thead>
      <tbody>
        <tr>
          <td>CS101 — Intro to Programming</td>
          <td>58</td>
          <td>7</td>
          <td>Nov 28</td>
          <td class="actions">
            <button class="btn">Open</button>
            <button class="btn">Announce</button>
          </td>
        </tr>
        <tr>
          <td>CS220 — Data Structures</td>
          <td>42</td>
          <td>3</td>
          <td>Nov 29</td>
          <td class="actions">
            <button class="btn">Open</button>
            <button class="btn">Announce</button>
          </td>
        </tr>
        <tr>
          <td>CS340 — AI Systems</td>
          <td>37</td>
          <td>2</td>
          <td>Dec 2</td>
          <td class="actions">
            <button class="btn">Open</button>
            <button class="btn">Announce</button>
          </td>
        </tr>
      </tbody>
    </table>
  </section>
  </main>
  </div>

  <footer>© 2025 AI-Assisted LMS • Faculty Dashboard</footer>
</body>
</html>
```

```css
 1    /* Theme tokens */
 2    :root{
 3      --bg:☐#f7f9fc; --surface:☐#ffffff; --text:■#1a1f2b; --muted:■#5a6473;
 4      --primary:■#2d6cdf; --primary-ink:■#0f264f; --border:☐#e1e6ef; --accent:■#14b8a6;
 5      --warn:■#f59e0b; --danger:■#ef4444;
 6      --radius:12px; --shadow:0 6px 20px ☐rgba(18,38,63,.08);
 7    }
 8
 9    /* Resets */
10    *{box-sizing:border-box}
11    body{
12      margin:0; font:14px/1.5 system-ui,-apple-system,Segoe UI,Roboto,Ubuntu;
13      color:var(--text); background:var(--bg)
14    }
15    a{color:var(--primary); text-decoration:none}
16
17    /* Header */
18    header{
19      position:sticky; top:0; z-index:10; background:var(--surface); border-bottom:1px solid var(--border);
20      display:flex; gap:14px; align-items:center; padding:10px 16px;
21    }
22    .logo{font-weight:700; letter-spacing:.3px; color:var(--primary-ink)}
23    .nav-flex{display:flex; gap:12px; align-items:center; flex:1}
24    .select, .search input{
25      border:1px solid var(--border); background:☐#fff; border-radius:8px; padding:8px 10px;
26    }
27    .search{flex:1; display:flex; align-items:center; gap:8px}
28    .search input{width:100%}
29    .user{display:flex; align-items:center; gap:8px; color:var(--muted)}
30
31    /* Layout */
32    .layout{
33      display:grid; grid-template-columns: 260px 1fr; gap:16px; padding:16px;
34      max-width:1200px; margin:0 auto
35    }
36    aside{
37      background:var(--surface); border:1px solid var(--border); border-radius:var(--radius); box-shadow:var(--shadow)
38    }
39
40    /* Sidebar */
41    .menu{list-style:none; margin:0; padding:10px}
42    .menu li{margin:2px 0}
43    .menu a{
44      display:flex; gap:10px; align-items:center; padding:10px 12px; border-radius:10px; color:var(--text)
45    }
46    .menu a:hover, .menu a.active{background:☐#f0f5ff}
47
48    /* Main */
49    main{display:flex; flex-direction:column; gap:16px}
50    .grid{display:grid; grid-template-columns: repeat(3,1fr); gap:16px}
51    .card{
52      background:var(--surface); border:1px solid var(--border); border-radius:var(--radius);
53      box-shadow:var(--shadow); padding:14px
54    }
55    .card h3{margin:0 0 8px 0; font-size:16px}
56    .muted{color:var(--muted)}
```

```css
57    .tasks li{
58        display:flex; justify-content:space-between; padding:8px 0; border-bottom:1px dashed var(--border)
59    }
60    .tasks li:last-child{border-bottom:none}
61    .badge{
62        display:inline-block; padding:2px 8px; border-radius:999px; font-size:12px; border:1px solid var(--border); color:var(--muted)
63    }
64
65    /* Table */
66    .table{
67        background:var(--surface); border:1px solid var(--border); border-radius:var(--radius);
68        box-shadow:var(--shadow); overflow:hidden
69    }
70    table{width:100%; border-collapse:collapse}
71    th, td{padding:12px 10px; border-bottom:1px solid var(--border); text-align:left}
72    th{background: #f3f6fb; font-weight:600}
73    tr:last-child td{border-bottom:none}
74    .actions{display:flex; gap:8px}
75
76    /* Buttons */
77    .btn{
78        appearance:none; border:1px solid var(--border); background: #fff; color:var(--text);
79        padding:8px 10px; border-radius:10px; cursor:pointer
80    }
81    .btn.primary{background:var(--primary); color: #fff; border-color:transparent}
82    .btn.accent{background:var(--accent); color: #063}
83    .btn.warn{background:var(--warn); color: #fff; border-color:transparent}
84
85    /* Quick actions */
86    .quick{display:grid; grid-template-columns: 1fr 1fr; gap:12px; align-items:center}
87    .prompt{grid-column:1/-1}
88    .prompt textarea{
89        width:100%; min-height:70px; border:1px solid var(--border); border-radius:10px; padding:10px; resize:vertical
90    }
91
92    /* Footer */
93    footer{padding:20px 16px; color:var(--muted); text-align:center}
94
95    /* Responsive */
96    @media (max-width: 960px){
97        .layout{grid-template-columns: 1fr}
98        aside{order:2}
99        .grid{grid-template-columns: 1fr}
100   }
```

OUTPUT :

Course	Enrollments	Pending grades	Next due	Actions	
CS101 — Intro to Programming	58	7	Nov 28	Open	Announce
CS220 — Data Structures	42	3	Nov 29	Open	Announce
CS340 — AI Systems	37	2	Dec 2	Open	Announce

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OBSERVATION :

- Zero-shot prompting works when requirements are explicit and scoped: structure, components, accessibility, and constraints.

- Without examples, the AI may vary aesthetic choices; specifying semantic HTML, responsive layout, and content blocks keeps outputs consistent.

- Embedding CSS variables enables quick theming, and using mobile-first media queries preserves usability on smaller screens.

- For richer interactivity (filters, modals, AI calls), you'd add progressive enhancement later with JS, but this meets the zero-shot task cleanly.

TASK 2 : Use one-shot prompt to redesign the UI with responsive layout.

PROMPT :

You are a front-end UI designer.

Task: Redesign the AI-assisted LMS Faculty Dashboard with a modern, responsive layout.

Constraints:

- Use semantic HTML5 and external CSS.

- Responsive grid/flexbox layout that adapts to desktop, tablet, and mobile.

- Include: top navbar (logo, search, user menu), sidebar (Overview, Courses, Assignments, Gradebook, Messages, Settings), main content with cards (Tasks, Grading Queue, Messages), AI Quick Actions panel, and Active Courses table.

- Keep design minimal, accessible, and mobile-first.

Output: index.html and styles.css files.

CODE :

```html
<> finallabq2t2.html > ⬡ html > ⬡ head > ⬡ link
1    <!doctype html>
2    <html lang="en">
3    <head>
4      <meta charset="utf-8">
5      <title>AI-Assisted LMS Dashboard</title>
6      <meta name="viewport" content="width=device-width, initial-scale=1">
7      <link href="style2.css" rel="stylesheet">
8    </head>
9    <body>
10     <header>
11       <div class="logo">🎓 LMS</div>
12       <div class="search">
13         <input type="search" placeholder="Search..." aria-label="Search dashboard">
14       </div>
15       <div class="user">🧑‍🦰 Neha</div>
16     </header>
17
18     <div class="layout">
19       <aside>
20         <nav>
21           <ul>
22             <li><a href="#">🏠 Overview</a></li>
23             <li><a href="#">📚 Courses</a></li>
24             <li><a href="#">📝 Assignments</a></li>
25             <li><a href="#">📊 Gradebook</a></li>
26             <li><a href="#">✉️ Messages</a></li>
27             <li><a href="#">⚙️ Settings</a></li>
28           </ul>
29         </nav>
```

```html
        </aside>

        <main>
          <section class="cards">
            <div class="card">
              <h3>Tasks</h3>
              <ul>
                <li>Finalize rubric</li>
                <li>Schedule office hours</li>
              </ul>
            </div>
            <div class="card">
              <h3>Grading Queue</h3>
              <p>12 submissions pending</p>
            </div>
            <div class="card">
              <h3>Messages</h3>
              <p>3 unread</p>
            </div>
          </section>

          <section class="card">
            <h3>AI Quick Actions</h3>
            <div class="actions">
              <button>📝 Draft announcement</button>
              <button>🧩 Generate rubric</button>
              <button>📧 Summarize messages</button>
            </div>
            <textarea placeholder="Enter prompt for assistant..."></textarea>
          </section>

          <section class="card">
            <h3>Active Courses</h3>
            <table>
              <thead>
                <tr>
                  <th>Course</th><th>Enrollments</th><th>Pending</th><th>Next Due</th>
                </tr>
              </thead>
              <tbody>
                <tr><td>CS101</td><td>58</td><td>7</td><td>Nov 28</td></tr>
                <tr><td>CS220</td><td>42</td><td>3</td><td>Nov 29</td></tr>
              </tbody>
            </table>
          </section>
        </main>
      </div>

    <footer>© 2025 AI-Assisted LMS</footer>
  </body>
</html>
```

```css
# style2.css > ...
  1    :root {
  2      --bg:⬜#f7f9fc; --surface:⬜#fff; --text:⬛#1a1f2b; --primary:🟦#2d6cdf;
  3      --border:⬜#e1e6ef; --radius:10px;
  4    }
  5
  6    *{box-sizing:border-box; margin:0; padding:0}
  7    body{font:14px/1.5 system-ui; background:var(--bg); color:var(--text)}
  8
  9    header{
 10      display:flex; justify-content:space-between; align-items:center;
 11      padding:10px 16px; background:var(--surface); border-bottom:1px solid var(--border);
 12    }
 13    .logo{font-weight:bold; color:var(--primary)}
 14    .search input{padding:6px 10px; border:1px solid var(--border); border-radius:var(--radius)}
 15    .user{color:⬛#555}
 16
 17    .layout{display:grid; grid-template-columns:220px 1fr; gap:16px; padding:16px}
 18    aside{background:var(--surface); border:1px solid var(--border); border-radius:var(--radius); padding:10px}
 19    aside ul{list-style:none}
 20    aside li{margin:8px 0}
 21    aside a{text-decoration:none; color:var(--text)}
 22
 23    main{display:flex; flex-direction:column; gap:16px}
 24    .cards{display:grid; grid-template-columns:repeat(auto-fit,minmax(200px,1fr)); gap:16px}
 25    .card{background:var(--surface); border:1px solid var(--border); border-radius:var(--radius); padding:12px}
 26    .card h3{margin-bottom:8px}
 27
 28    .actions{display:flex; gap:8px; flex-wrap:wrap}
 29    button{padding:8px 12px; border:none; border-radius:var(--radius); background:var(--primary); color:⬜#fff; cursor:pointer}
 30    textarea{width:100%; margin-top:10px; padding:8px; border:1px solid var(--border); border-radius:var(--radius)}
 31
 32    table{width:100%; border-collapse:collapse}
 33    th,td{padding:8px; border-bottom:1px solid var(--border); text-align:left}
 34    th{background:⬜#f0f4fa}
 35
 36    footer{text-align:center; padding:12px; color:⬛#555}
 37
 38    @media(max-width:768px){
 39      .layout{grid-template-columns:1fr}
 40      aside{order:2}
 41    }
```

OUTPUT :

OBSERVATION :

- **One-shot prompt** gave a redesigned UI without multiple examples — just a single clear instruction.
- The **responsive layout** ensures usability across devices (desktop, tablet, mobile).
- Separation of HTML and CSS improves maintainability.
- Compared to Task 1 (zero-shot), this design is **more modern and adaptive**, showing how one-shot prompting can guide the AI toward a specific style.