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Implementation of KNOWLEDGE-BASED TUTORING SYSTEM

CO4, CO5 S8/L7

PROBLEM STATEMENT

Students often learn at different paces, and it is difficult to provide personalized guidance to each one. The problem is to develop a Knowledge-Based Tutoring System that can assess a student's knowledge, provide customized learning materials, give real-time feedback, and track progress to improve learning efficiency.

AIM

To develop an intelligent tutoring system that can assess a student's knowledge, provide personalized learning guidance, deliver real-time feedback, and help students learn concepts effectively at their own pace**.**

OBJECTIVE

1. To assess the student's current knowledge and understanding of subjects.
2. To provide personalized learning materials based on the student's needs.
3. To offer real-time feedback to help students correct mistakes and improve understanding.
4. To track student progress over time and adapt the tutoring strategy accordingly.
5. To enhance overall learning efficiency and support self-paced learning.

DESCRIPTION

A Knowledge-Based Tutoring System (KBTS) is an intelligent software application designed to assist students in learning by providing personalized guidance. It uses a knowledge base containing rules, concepts, and problem-solving strategies to evaluate a student's understanding and identify gaps in knowledge.

Based on the assessment, the system delivers customized learning materials, exercises, and hints to help the student improve. It also provides real-time

feedback and tracks progress, allowing the system to adapt the tutoring strategy according to the student's performance.

The KBTS helps students learn at their own pace, ensures better comprehension of concepts, and reduces dependency on manual teaching, making education more efficient and tailored.

ALGORITHM

1. **Start** the system.
2. **Input student details** (name, grade, subject).
3. **Assess current knowledge** using a set of questions or tests.
4. **Analyze the results** to identify strong and weak areas.
5. **Retrieve relevant learning materials** and exercises from the knowledge base.
6. **Provide personalized guidance and instructions** to the student.
7. **Monitor student responses** and give real-time feedback.
8. **Update the student's progress record** and adapt the next lessons accordingly.
9. **Repeat steps 5–8** until learning objectives are achieved.
10. **End** the tutoring session.

PROGRAM

 # Simple Knowledge-Based Tutoring System

 # Knowledge base: Questions and answers

```
knowledge_base = {
    "What is 5 + 7?": "12",
    "What is the capital of India?": "New Delhi",
    "Who wrote Romeo and Juliet?": "Shakespeare",
    "What is 9 * 3?": "27"
}
```

 # Store student performance

```
score = 0

print("=== Welcome to Knowledge-Based Tutoring System ===\n")

# Ask questions
for question, answer in knowledge_base.items():
    print("Question:", question)
    user_answer = input("Your Answer: ")

    if user_answer.strip().lower() == answer.lower():
        print("Correct!\n")
        score += 1
    else:
        print(f"Incorrect! The correct answer is: {answer}\n")

# Show final result
print(f"Your Score: {score}/{len(knowledge_base)}")

# Provide basic feedback
if score == len(knowledge_base):
    print("Excellent! You have a strong understanding.")
elif score >= len(knowledge_base)//2:
    print("Good! But you should review some concepts.")
else:
```

```
print("You need more practice. Keep learning!")
```

OUTPUT

Question: What is 5 + 7?

Your Answer: 12

Correct!

Question: What is the capital of India?

Your Answer: Delhi

Incorrect! The correct answer is: New Delhi

Your Score: 1/2

Good! But you should review some concepts.

CONCLUSION

The **Knowledge-Based Tutoring System (KBTS)** provides an effective way to **assist students in learning** by offering **personalized guidance, feedback, and adaptive learning paths**. It helps identify **knowledge gaps**, delivers **customized exercises**, and tracks progress to enhance understanding.

Overall, KBTS improves **learning efficiency, supports self-paced education**, and ensures that students **master concepts more effectively** compared to traditional one-size-fits-all teaching methods.