



Vivekanand Education Society's Institute Of Technology
Department Of Information Technology

DSA mini Project
A.Y. 2025-26

Title: Health Checker

Sustainability Goal : Advancing Health Awareness and Accessible
Medical Guidance

Domain: Data Structures & Algorithms
Member: Yash Rai

Mentor Name: Kajal Jewani

1 NO
POVERTY



2 ZERO
HUNGER



3 GOOD HEALTH
AND WELL-BEING



4 QUALITY
EDUCATION



5 GENDER
EQUALITY



6 CLEAN WATER
AND SANITATION



7 AFFORDABLE AND
CLEAN ENERGY



8 DECENT WORK AND
ECONOMIC GROWTH



9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



10 REDUCED
INEQUALITIES



11 SUSTAINABLE CITIES
AND COMMUNITIES



THE GLOBAL GOALS

For Sustainable Development

12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



13 CLIMATE
ACTION



14 LIFE BELOW
WATER



15 LIFE
ON LAND



16 PEACE AND JUSTICE
STRONG INSTITUTIONS



17 PARTNERSHIPS
FOR THE GOALS





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Introduction to Project

Health Checker is a healthcare technology project developed using C programming with a binary decision tree architecture. This system serves as a medical assistant that conducts preliminary health assessments through intelligent symptom analysis.

By guiding users through an interactive question-and-answer process, Health Checker evaluates symptoms for over fifteen common medical conditions while providing reliable medication recommendations and implementing a crucial severity-based triage system to support informed healthcare decisions.



Problem Statement

In today's healthcare landscape, several critical issues exist like

- 1) Limited Access to Healthcare
- 2) Information Overload
- 3) Delayed Care

There is a need for a systematic, tree-based diagnostic tool that provides reliable preliminary assessment, clear recommendations, and guidance on when professional medical care is necessary.



Objectives of the project

- Implement binary tree for symptom assessment
- Provide preliminary health evaluation
- Offer treatment guidance (meds + home remedies)
- Determine urgency levels
- Health education & prevention tips
- Integrate maps using OpenStreetMaps API



Scope of the project

Target Users:

- General public seeking preliminary health guidance
- Students learning about common health conditions
- Individuals in remote areas with limited healthcare access
- People wanting to assess symptom severity before doctor visits



Requirements of the system (Hardware, software)

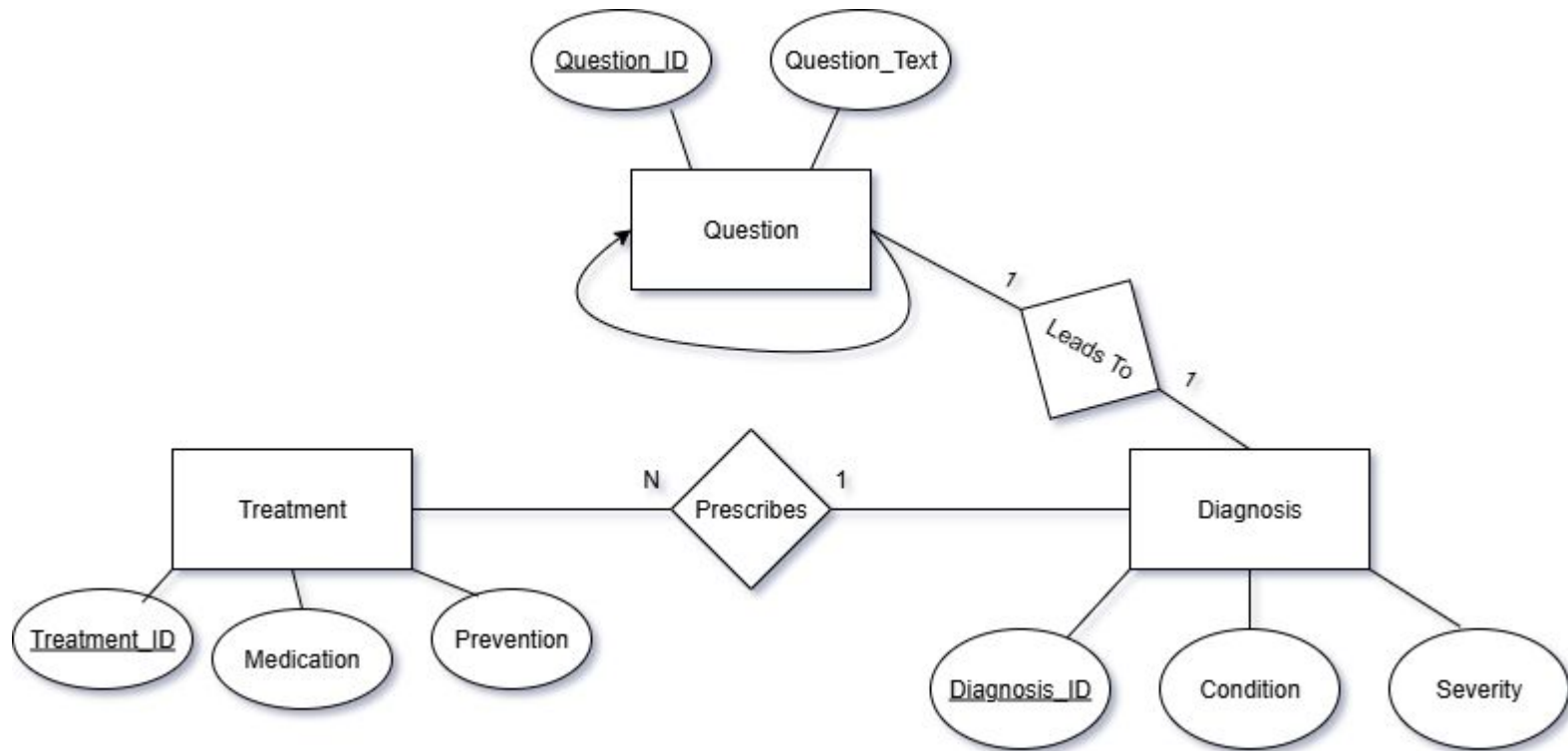
Hardware:

- Processor: Intel i3 or higher (Any modern processor)
- RAM: Minimum 2GB (4GB recommended)
- Storage: 50MB free disk space

Software:

- OS: Windows 10/11
- Compiler: GCC (GNU Compiler Collection) - MinGW/TDM-GCC for Windows
- Terminal: CMD/PowerShell

ER Diagram of the Proposed System





Data Structures and Concepts used

➤ Binary Tree

Each node represents either:

- ❑ QUESTION_NODE: A symptom-related question
- ❑ DIAGNOSIS_NODE: Final diagnosis (leaf node)



Time and Space Complexity

1) Time Complexity:

Each of the n nodes is created once during tree building.

Hence the time complexity is $O(n)$.

2) Space complexity:

We need to store all n nodes in memory simultaneously.

Hence the space Complexity is $O(n)$.



Front End

- **Interactive Q&A Flow** - Guided yes/no questions about symptoms
- **Severity Levels** - Emergency, Urgent, Moderate and Mild
- **Comprehensive Diagnosis Reports including:**
 - Condition description and severity assessment
 - Home remedies.
 - Specific medication guidance with dosages
- **Multiple Health Categories covering:** Respiratory issues, Digestive problems, Headaches and pain, General wellness, etc



Implementation

- Uses **binary decision tree** to navigate symptom assessment in C language.
- **Tree nodes contain:**
 - Question nodes for symptom interrogation
 - Diagnosis nodes for final condition assessment
- **Tree Architecture:**
 - **Root Node**: Starts with emergency symptom detection (chest pain, breathing difficulty)
 - **Internal Nodes**: Question nodes that branch based on Yes/No responses
 - **Leaf Nodes**: Diagnosis nodes that provide final assessment



Gantt Chart

Task	Week 1	Week 2	Week 3	Week 4
Project Planning	✓			
Data Structure Design	✓			
Core Logic (Tree)		✓		
Traversal Algorithm		✓		
UI/CLI Implementation			✓	
Testing & Debugging			✓	✓
Documentation & Report				✓



Test Cases

Test Case ID	Input Path	Expected Output	Status
TC-01	Severe chest pain = YES	EMERGENCY: Potential Medical Emergency	✓ Pass
TC-02	Fever >3 days + body aches + cough	Influenza (MODERATE)	✓ Pass
TC-03	Fever <3 days + mild symptoms	Common Viral Infection (MILD)	✓ Pass



Future Scope

- Develop Desktop application
- Develop mobile application (Android/IOS)
- Expand diagnosis database to 50+ conditions .
- Voice interface for hands-free operation
- Multi-language support
- Connect with wearable devices for vital signs



Code

Diagnosis Structure

```
typedef struct {  
    char condition[MAX_TEXT];  
    Severity severity;  
    char description[MAX_TEXT];  
    char remedies[MAX_TEXT];  
    char medications[MAX_TEXT];  
    char when_to_see_doctor[MAX_TEXT];  
    char prevention[MAX_TEXT];  
} Diagnosis;
```

Decision Tree Building Function

```
TreeNode* buildSymptomTree() {  
    // Root question  
    TreeNode* root = createNode(QUESTION_NODE,  
        "Are you experiencing severe chest pain, difficulty breathing, or loss of  
  
    // EMERGENCY CONDITIONS  
    Diagnosis* emergency = createDiagnosis(  
        "POTENTIAL MEDICAL EMERGENCY",  
        EMERGENCY,  
        "You may be experiencing a life-threatening condition...",  
        "DO NOT WAIT - Take immediate action",  
        "Call emergency services (112) immediately",
```



Output Screenshots

HEALTH CHECKER

Your Personal Health Assistant



Identify your potential health condition



Provide specific medication recommendations



Suggest home remedies and self-care tips



Tell you when professional care is needed



Daily health tips for better wellness



Find nearest hospitals and clinics



Save and review your previous assessments



Modern dark/light mode toggle

HOW IT WORKS:

1. Answer simple YES/NO questions about your symptoms
2. Get a detailed diagnosis with treatment options
3. Follow the recommendations or seek professional help

DAILY HEALTH TIP:

Loading health tip...



IMPORTANT DISCLAIMER:

This tool provides **general guidance** based on common conditions. It is **NOT** a replacement for professional medical advice. If experiencing emergency symptoms, call 112 immediately!



Begin Assessment



View History



Output Screenshots

Question 4 of 6

QUESTION:

Are you experiencing stomach pain, nausea, or digestive issues?

✓ Yes

✗ No



Output Screenshots

INFLUENZA (FLU)

[!] MODERATE

SEVERITY LEVEL:

MODERATE

WHAT IS THIS?

You likely have the flu, a viral infection affecting the respiratory system. Most people recover within 1-2 weeks.

HOME REMEDIES & SELF-CARE:

Rest, drink plenty of fluids (water, warm soups), use a humidifier, gargle with salt water

RECOMMENDED MEDICATIONS:

Acetaminophen (Tylenol) 500-1000mg every 6 hours OR Ibuprofen (Advil) 400mg every 6 hours for fever/pain. Antiviral medications (Tamiflu) if prescribed within 48 hours of symptom onset

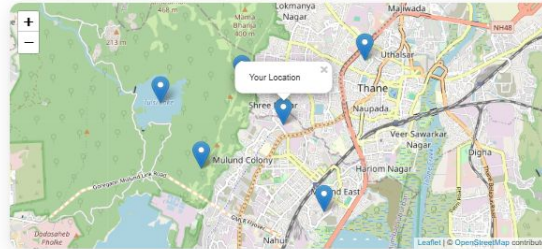
WHEN TO SEE A DOCTOR:

If fever persists beyond 5 days, difficulty breathing develops, or symptoms worsen

PREVENTION TIPS:

Annual flu vaccination, frequent handwashing, avoid close contact with sick individuals

NEAREST HOSPITALS & CLINICS:



Nearby Medical Facilities:

General Hospital

123 Main St, City Center
1.2 km

City Medical Center

456 Health Ave, Downtown
2.5 km

Community Clinic

789 Wellness Blvd, Suburb
3.1 km



Conclusion

➤ Impacts:

- Provides preliminary health assessment without immediate doctor visit
- Helps users make informed decisions about seeking medical care
- Reduces unnecessary emergency room visits for minor conditions
- Educates users about common health conditions



References

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- C Programming: A Modern Approach - K. N. King
- Data Structures Using C - Aaron M. Tenenbaum
- Programming in ANSI C - E. Balagurusamy
- C Programming Tutorial - GeeksForGeeks