Winter Semester 2023 – 2024

Course Name:

SOFTWARE SECURITY

Course Code:

SWE-2020

Title:

LUNG CANCER PREDICTION SYSTEM

Under The Guidance Of

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By:

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Group ID : 6

1.OBJECTIVE:

The objective of the Lung Cancer Prediction System is to develop an accurate and reliable computational model capable of predicting the likelihood of an individual developing lung cancer based on various demographic, clinical, and lifestyle factors. This system aims to assist healthcare professionals in identifying individuals who may be at high risk for lung cancer, thereby facilitating early detection, intervention, and personalized treatment strategies. Ultimately, the goal is to improve patient outcomes by enabling timely preventive measures and targeted healthcare interventions to mitigate the impact of lung cancer.

2.MOTIVATION:

The motivation behind developing the Lung Cancer Prediction System stems from the pressing need to enhance early detection and intervention strategies for lung cancer, a leading cause of cancer-related deaths worldwide. By leveraging computational models and predictive analytics, we aim to empower healthcare providers with tools to identify high-risk individuals, thereby enabling timely interventions, personalized treatment plans, and improved patient outcomes. This work seeks to address the significant public health challenge posed by lung cancer and contribute to the advancement of preventive healthcare practices.

3.GQM (GOALS QUESTIONARIES METRICS):

GOALS:

1. Develop a Reliable Lung Cancer Prediction System to assist medical practitioner in early detection and treatment.
2. Identify Key Associations between Air Pollution and Lung Cancer Incidence
3. Investigate the Impact of Environmental Factors on Lung Cancer Risk
4. Improve Accessibility and Usability of the Lung Cancer Prediction System

QUESTIONARIES:

for GOAL1:

1. How does the prediction system's performance compare to existing diagnostic methods in terms of sensitivity and specificity?
2. What is the predictive power of the system across different patient demographics and disease stages?

for GOAL2:

1. Does Air Pollution correlate with increased rate of Lung Cancer?
2. What is the impact of Air Pollution levels on the likelihood of developing lung cancer?

for GOAL 3:

1. How do Environmental Factors such as Smoking, Occupational Exposures, and Lifestyle habits contribute to Lung Cancer Risk?
2. Do Environmental Factors interact with Genetics to Influent the risk of Lung Cancer?

for GOAL 4:

1. How user-friendly is the Lung Cancer Prediction System for medical practitioners with varying levels of technical expertise?
2. How adaptable is the system in various Environment to increase the Usability?

DIRECT METRICS:

1. Lines of Code (LOC)
2. Execution Speed
3. Memory Size
4. Defects Reported Over Time
5. Training Time

INDIRECT METRICS:

1. Quality
2. Accuracy
3. Reliability
4. Efficiency
5. Insightfulness

4. SAMPLES IDENTIFIED TO MEET THE OBJECTIVE:

Patient Data:

-Age
-Gender
-Alcohol use Level
-Dust Allergy Level
-Genetic Risk level
-Chronic Lung Disease level
-Balanced Diet
-Obesity level
-Smoking level
-Chest Pain level
-Fatigue level
-Weight loss level
-Shortness of breath level
-Wheezing level
-Swallowing Difficulty Level
-Clubbing of Fingers
-Frequent Cold
-Dry Cough level -Snoring level

Environmental Data:

-Air Pollution Level
-Occupational Hazards

5. DEPENDENT AND INDEPENDENT VARIABLES:

Dependent Variables:
Level

Independent Variables:

Gender

Air Pollution

Alcohol use

Dust Allergy

OccuPational Hazards

Genetic Risk

chronic Lung Disease

Balanced Diet

Obesity

Smoking

Passive Smoker

Chest Pain

Coughing of Blood

Fatigue

Weight Loss

Shortness of Breath

Wheezing

Swallowing Difficulty

Clubbing of Finger Nails

Frequent Cold

Dry Cough'

Snoring

6.SOURCE LINK:

GROUP CONTRIBUTION DETAILS:

21MIS0196 – MUGUNTHAN N : Goal 1 & 2, Related Questionaries and Metrics, Dataset collection, Documentation.
21MIS0341 - NITHISH KUMAR R : Goal 3 & 4, Related Questionaries and Metrics, Dataset collection and Documentation.