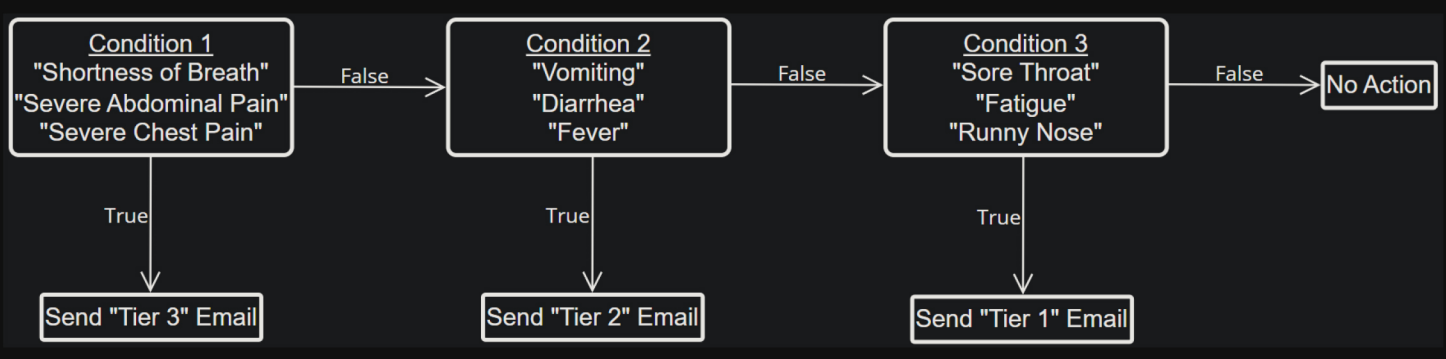
COMP 1100
Spring 2025
Assignment 1 – Expert Systems

Introduction

The purpose of this system is to monitor health symptoms entered by users through a form and send appropriate alerts based on predefined rules. In the realm of health monitoring- the workflow helps identify potential health issues before they escalate, enabling faster responses to emerging health concerns. Expert systems are important for structured decision-making as they mimic the decision-making capabilities of human health experts, providing case evaluation that is consistent, efficient, and reliable. My expert system works by analyzing a particular response within a Microsoft form and performing one of three different actions depending on the content in that response.

System Design and Rules

There are three conditional rules that analyze the content within the "Select experienced symptoms below" response on the form. The first returns true if the response contains "Shortness of Breath", "Severe Abdominal Pain", or "Severe Chest Pain" and false otherwise. If true, it sends a "Tier 3" email. If false, it proceeds to the second conditional rule. The second returns true if the response contains "Vomiting", "Diarrhea", or "Fever" and false otherwise. If true, it sends a "Tier 2" email. If false, it proceeds to the third and final conditional rule. The third returns true if the response contains "Sore Throat", "Fatigue", or "Runny Nose" and false otherwise. If true, it sends a "Tier 1" email. If false (the user has selected no symptoms or only the "I feel well" option), no action is taken. The following is a flowchart I've included to help visualize my logic:

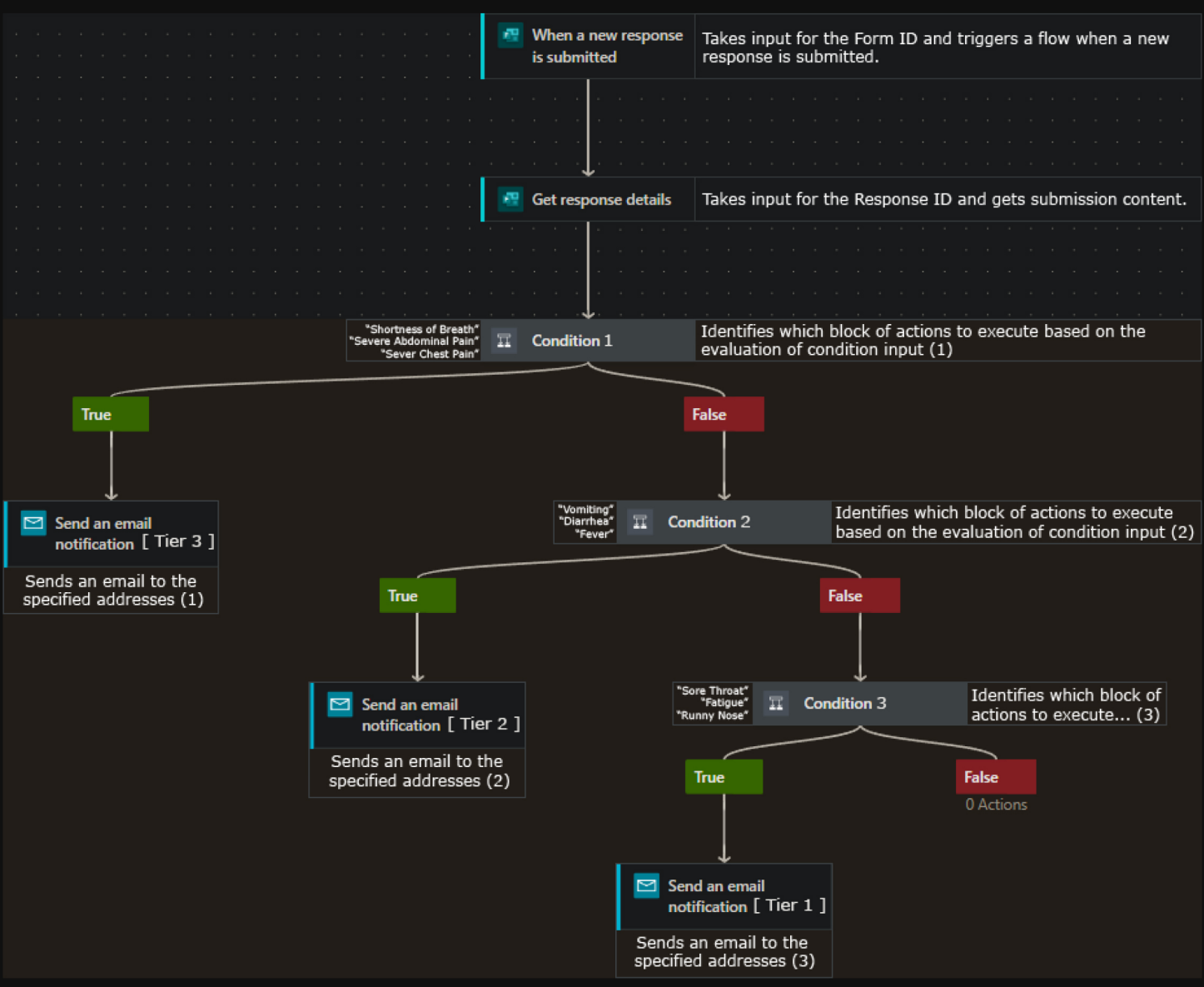


Workflow Implementation

To set up my system in Power Automate, I did the following:

1. Created Microsoft Form and tested to ensure it worked and that the responses were recorded correctly.
2. Created workflow in Power Automate- linked my account to select my Microsoft Form and Response ID.
3. Created actions to initiate workflow and receive response details.
4. Created conditions and email actions to finalize the workflow.
5. Used Power Automate's built-in "Test" feature to ensure form submission triggered the correct actions.

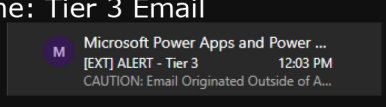
The following is a screenshot of my Power Automate workflow with annotations to explain each step:



Testing and Results

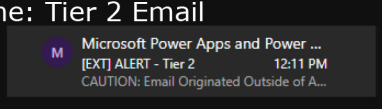
<u>Test Case 1</u>

Input: "Severe Abdominal Pain", "Vomiting", "Sore Throat"
Expected Outcome: Tier 3 Email
Actual Outcome:



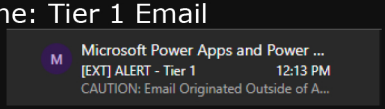
<u>Test Case 2</u>

Input: "Diarrhea", "Fatigue", "Runny Nose"
Expected Outcome: Tier 2 Email
Actual Outcome:



<u>Test Case 3</u>

Input: "Sore Throat", "Fatigue", "Runny Nose"
Expected Outcome: Tier 1 Email
Actual Outcome:



<u>Reflection and Conclusion</u>

Some strengths of my system could be the simplicity and clarity: the conditional statements are easy to follow, the real-time response: alerts are immediately sent when specific symptoms are detected, and consistency: the predefined rules guarantee that every user response is evaluated against the same criteria. Some weaknesses however, could be the limited nuance in decision making: the if-else/conditional statements can oversimplify complex health scenarios, and the lack of personalization: the system doesn't consider additional user data or historical patterns.

The system *does* meet the requirements of the assignment exceptionally. If the assignment had more complex or in-depth requirements however, I might suggest there be some additions to my system. Enhanced rule complexity, integration of machine learning, data enrichment, feedback mechanisms, scalability/integration – are all good additions/improvements/extensions that I'd consider adding to my system.