**Hala Mallak**

**202010001**

**AI Assignment 2**

```
package weatherprediction;

import java.util.Scanner;

public class WeatherPrediction {

    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);

        System.out.println("Enter today conditions (please answer with just yes
or no) :");
        System.out.print("Is it raining?");
        String today = in.nextLine().trim().toLowerCase();
        boolean isRain = false, isDry = false;

        if (today.equals("yes")) {
            isRain = true;
        } else if (today.equals("no")) {
            isDry = true;
        } else {
            System.out.println("Invalid input please try again");
```

```
            in.close();
            return;
        }

        double rainfallCf = 0;
        if (isRain) {
            System.out.print("Is there rainfall?");
            String rainfall = in.nextLine().trim().toLowerCase();
            if (rainfall.equals("yes")) {
                System.out.print("Is the rainfall low?");
                String rainfallLow = in.nextLine().trim().toLowerCase();
                if (rainfallLow.equals("yes")) {
                    rainfallCf = validateInput(in, "To what degree do you believe the
rainfall is low? (Enter CF between -1 and 1): ");
                }
            }
        }

        System.out.print("Is the temperature cold or warm? (cold OR warm):
");
        String temperature = in.nextLine().trim().toLowerCase();
        boolean temperatureIsCold = false, temperatureIsWarm = false;
        double temperatureCf = 0;

        if (temperature.equals("cold")) {
```

```
            temperatureIsCold = true;
            temperatureCf = validateInput(in, "To what degree do you believe the temperature is cold? (Enter CF between -1 and 1): ");
        } else if (temperature.equals("warm")) {
            temperatureIsWarm = true;
            temperatureCf = validateInput(in, "To what degree do you believe the temperature is warm? (Enter CF between -1 and 1): ");
        } else {
            System.out.println("Invalid input.");
            in.close();
            return;
        }

        System.out.print("Is the sky overcast?");
        String skyOvercast = in.nextLine().trim().toLowerCase();
        boolean skyIsOvercast = false;
        double skyCf = 0;

        if (skyOvercast.equals("yes")) {
            skyIsOvercast = true;
            skyCf = validateInput(in, "To what degree do you believe the sky is overcast? (Enter CF between -1 and 1): ");
        }

        double cfRain = 0;
```

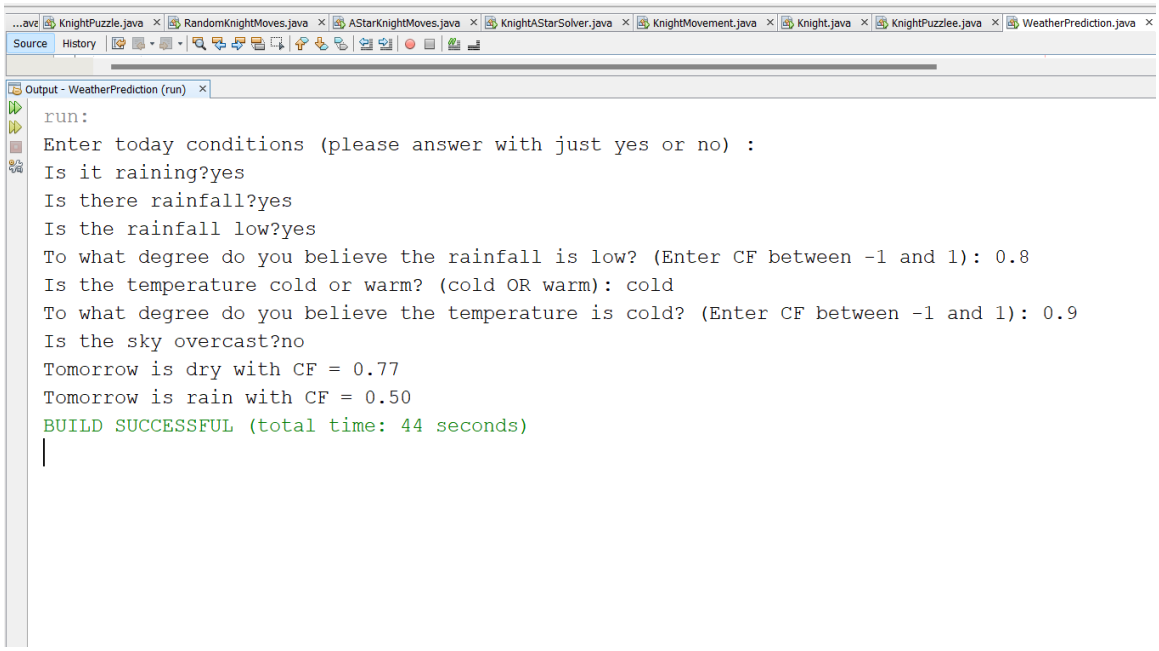
```
double cfDry = 0;

if (isRain) {
    cfRain = 0.5;
    if (rainfallCf != 0) {
        cfDry = 0.6 * rainfallCf;
        if (temperatureIsCold) {
            double combinedCf = 0.7 * Math.min(rainfallCf, temperatureCf);
            cfDry = CalculateCF(cfDry, combinedCf);
        }
    }
}
if (isDry) {
    cfDry = 0.5;
    if (temperatureIsWarm) {
        cfRain = 0.65 * temperatureCf;
        if (skyIsOvercast) {
            double combinedCf = 0.55 * Math.min(temperatureCf, skyCf);
            cfRain = CalculateCF(cfRain, combinedCf);
        }
    }
}

System.out.printf("Tomorrow is dry with CF = %.2f%n", cfDry);
```

```
    System.out.printf("Tomorrow is rain with CF = %.2f%n", cfRain);

    in.close();
}

public static double CalculateCF(double cf1, double cf2) {
    if (cf1 > 0 && cf2 > 0) {
        return cf1 + cf2 * (1 - cf1);
    } else if (cf1 < 0 && cf2 < 0) {
        return cf1 + cf2 * (1 + cf1);
    } else if (cf1 < 0 || cf2 < 0) {
        return (cf1 + cf2) / (1 - Math.min(Math.abs(cf1), Math.abs(cf2)));
    }
    return 0;
}

public static double validateInput(Scanner scanner, String prompt) {
    while (true) {
        System.out.print(prompt);
        try {
            double cf = Double.parseDouble(scanner.nextLine().trim());
            if (cf >= -1 && cf <= 1) {
                return cf;
            } else {
```

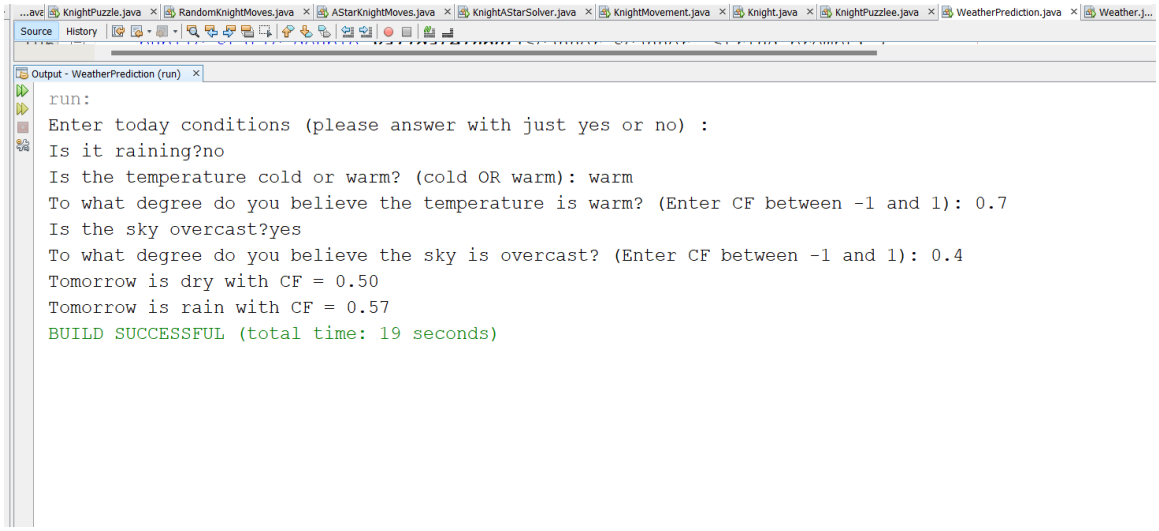
```
                System.out.println("Please enter a value between -1 and 1.");
            }
        } catch (NumberFormatException e) {
            System.out.println("Invalid input, Please enter a numerical value between -1 and 1.");
        }
    }
}
```

## Test Cases:

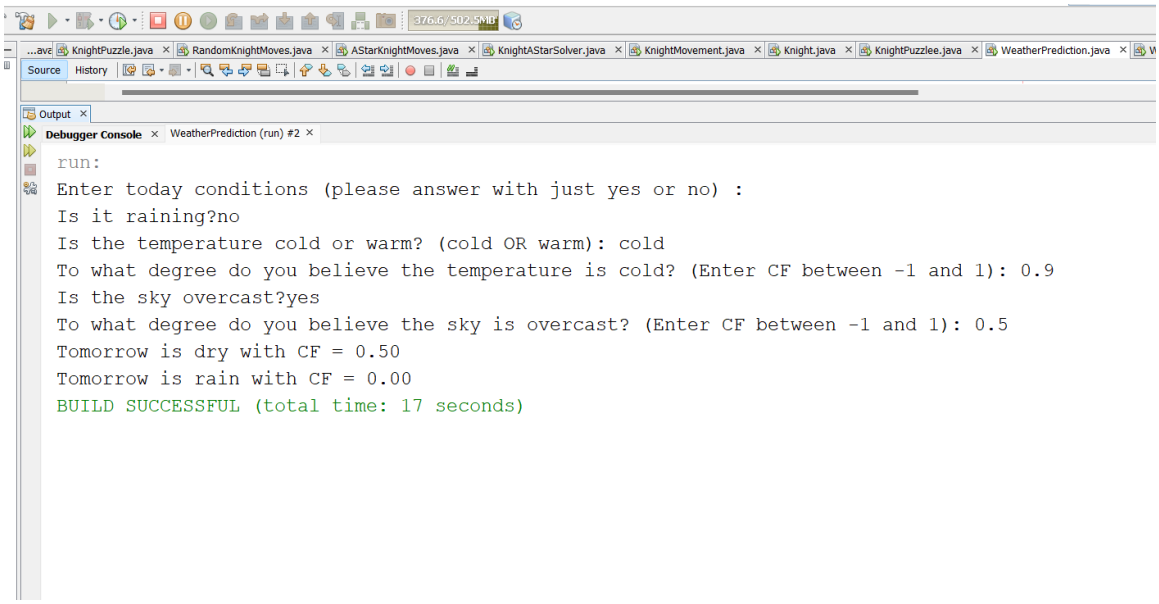
1. The case in the Video:



**2.**


KnightPuzzle.java
RandomKnightMoves.java
AStarKnightMoves.java
KnightAStarSolver.java
KnightMovement.java
Knight.java
KnightPuzzlee.java
WeatherPrediction.java
Source
History
Output - WeatherPrediction (run)
run:
Enter today conditions (please answer with just yes or no) :
Is it raining?no
Is the temperature cold or warm? (cold OR warm): warm
To what degree do you believe the temperature is warm? (Enter CF between -1 and 1): 0.7
Is the sky overcast?yes
To what degree do you believe the sky is overcast? (Enter CF between -1 and 1): 0.4
Tomorrow is dry with CF = 0.50
Tomorrow is rain with CF = 0.57
BUILD SUCCESSFUL (total time: 19 seconds)

**3.**


KnightPuzzle.java
RandomKnightMoves.java
AStarKnightMoves.java
KnightAStarSolver.java
KnightMovement.java
Knight.java
KnightPuzzlee.java
WeatherPrediction.java
Source
History
Output
Debugger Console
WeatherPrediction (run) #2
run:
Enter today conditions (please answer with just yes or no) :
Is it raining?no
Is the temperature cold or warm? (cold OR warm): cold
To what degree do you believe the temperature is cold? (Enter CF between -1 and 1): 0.9
Is the sky overcast?yes
To what degree do you believe the sky is overcast? (Enter CF between -1 and 1): 0.5
Tomorrow is dry with CF = 0.50
Tomorrow is rain with CF = 0.00
BUILD SUCCESSFUL (total time: 17 seconds)