ASSIGNMENT-7

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Java Foundations

Practices - Section 8:

The Soccer League

1. **Temperature Handling:**
    - Games are not played if the temperature is freezing (32°F or below).
    - The output mentions three consecutive "Too cold to play." messages, followed by "Season is over."
2. **Game and Season Statistics:**
    - Statistics for each game, including temperature and scores, are printed.
    - The hottest temperature and the average temperature are also calculated.

Areas to Check in the Code:

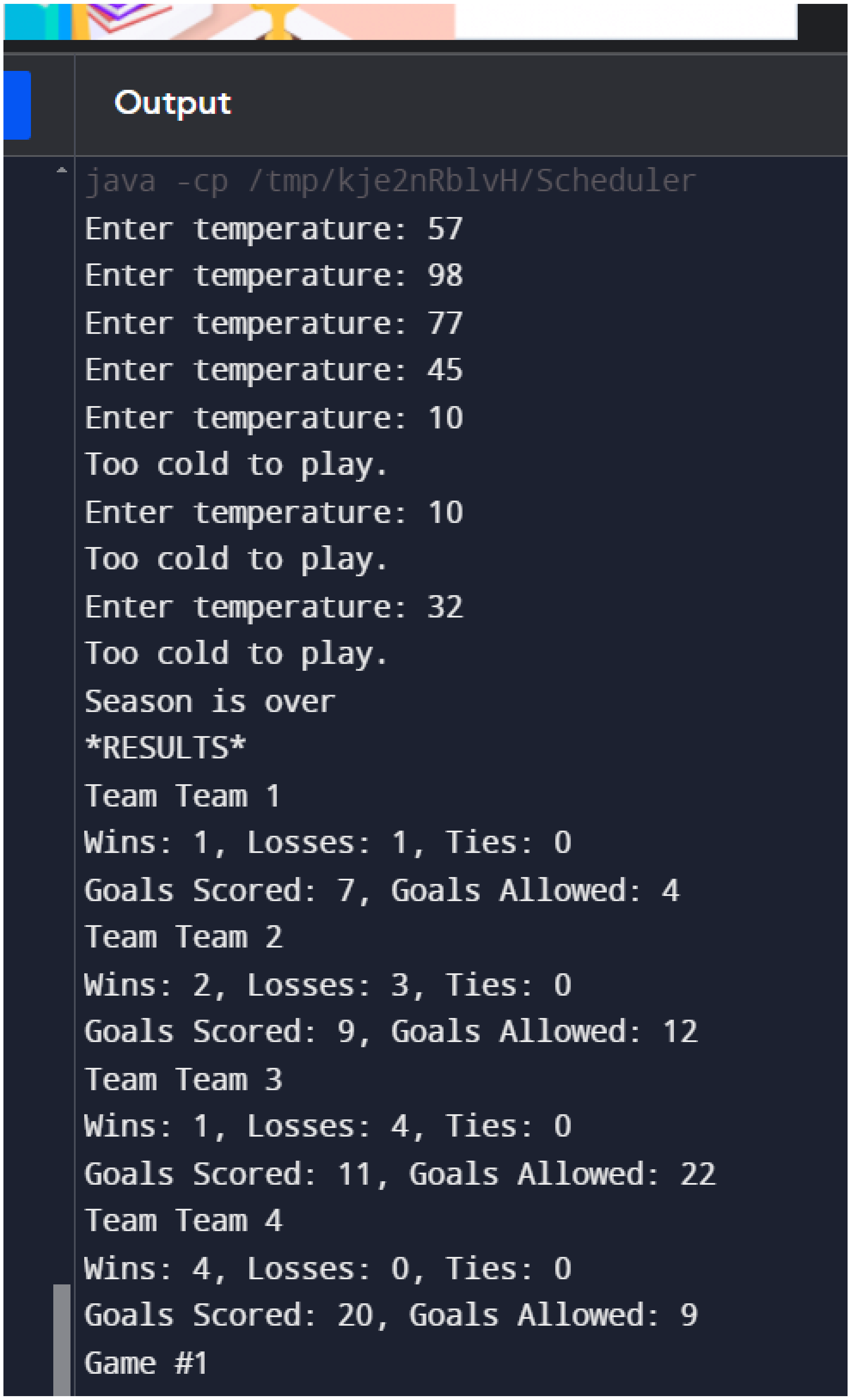
1. **Temperature Input and Freezing Check:**
    - Ensure that the program correctly identifies and handles freezing temperatures.
    - The season should end after three consecutive weeks of freezing temperatures.
2. **Game Results and Statistics:**
    - Ensure that the results of each game, including the temperature, are logged correctly.
    - Check that the statistics are cumulative and consistent with the description.

```
import java.util.ArrayList;

import java.util.Random;

import java.util.Scanner;


class Team {

  private String name;
private int wins;

private int losses;

private int ties;

private int goalsScored;

private int goalsAllowed;


public Team(String name) {

  this.name = name;

  this.wins = 0;

  this.losses = 0;

  this.ties = 0;

  this.goalsScored = 0;

  this.goalsAllowed = 0;

}


public String getName() {

  return name;

}


public void recordGame(int goalsFor, int goalsAgainst) {

  goalsScored += goalsFor;

  goalsAllowed += goalsAgainst;

  if (goalsFor > goalsAgainst) {

    wins++;

  } else if (goalsFor < goalsAgainst) {

    losses++;

  } else {

    ties++;

  }
```

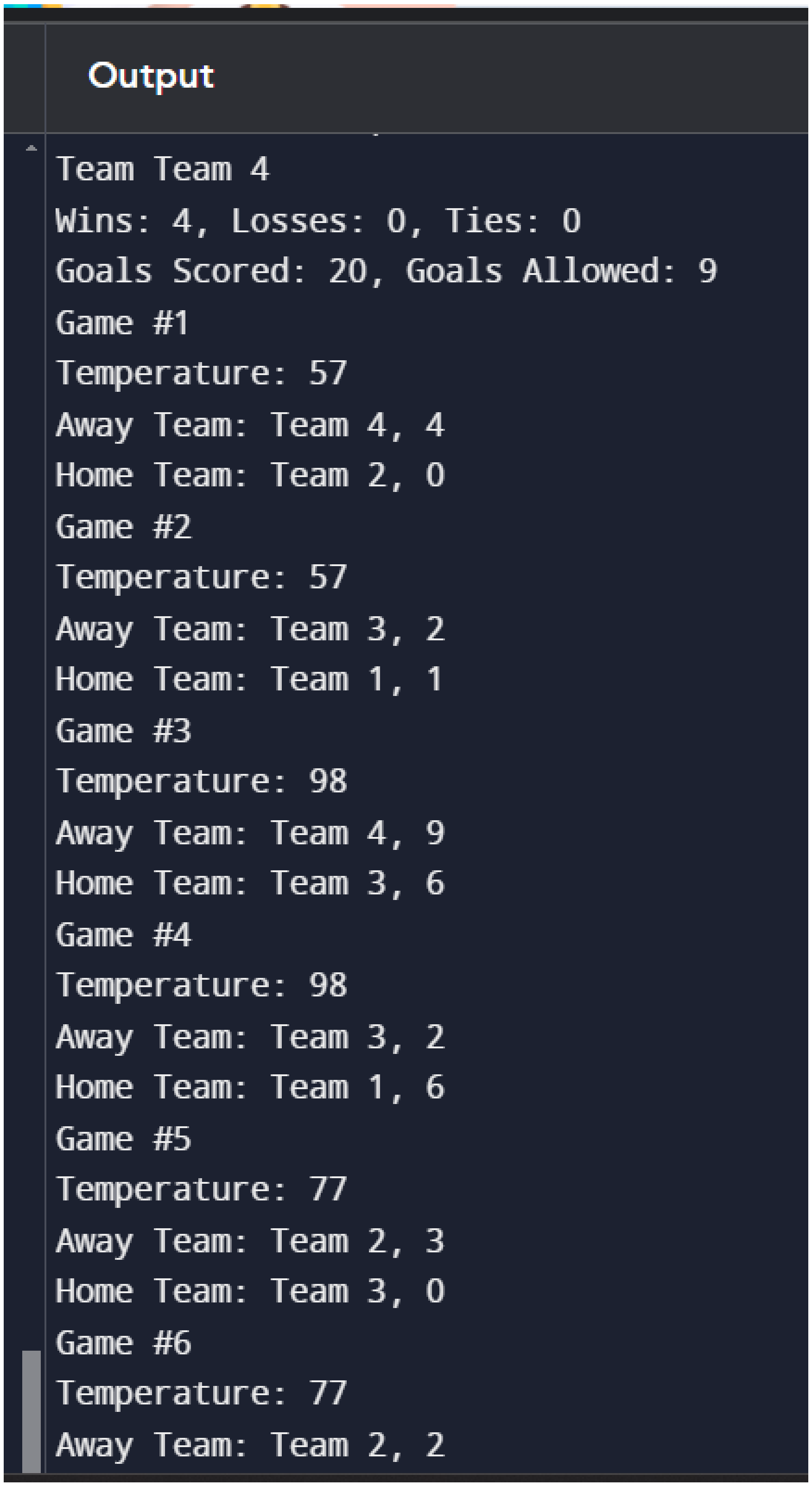
```
    }

    public void printStats() {
        System.out.println("Team " + name);
        System.out.println("Wins: " + wins + ", Losses: " + losses + ", Ties: " + ties);
        System.out.println("Goals Scored: " + goalsScored + ", Goals Allowed: " + goalsAllowed);
    }
}

class Game {
    private static int gameCounter = 0;
    private int gameId;
    private Team homeTeam;
    private Team awayTeam;
    private int homeScore;
    private int awayScore;
    private int temperature;

    public Game(Team homeTeam, Team awayTeam, int temperature) {
        this.gameId = ++gameCounter;
        this.homeTeam = homeTeam;
        this.awayTeam = awayTeam;
        this.temperature = temperature;
        playGame();
    }

    private void playGame() {
        Random rand = new Random();
        int maxGoals = Math.max(1, temperature / 10); // Goals proportional to temperature
        homeScore = rand.nextInt(maxGoals + 1);
        awayScore = rand.nextInt(maxGoals + 1);
        homeTeam.recordGame(homeScore, awayScore);
        awayTeam.recordGame(awayScore, homeScore);
    }

    public int getTemperature() {
        return temperature;
    }

    public void printGameResult() {
        System.out.println("Game #" + gameId);
        System.out.println("Temperature: " + temperature);
        System.out.println("Away Team: " + awayTeam.getName() + ", " + awayScore);
        System.out.println("Home Team: " + homeTeam.getName() + ", " + homeScore);
    }
}

class League {
    private ArrayList<Team> teams;
    private ArrayList<Game> games;
    private int hottestTemperature;
    private int totalTemperature;
    private int temperatureReadings;

    public League(String[] teamNames) {
        teams = new ArrayList<>();
        games = new ArrayList<>();
        hottestTemperature = Integer.MIN_VALUE;
        totalTemperature = 0;
        temperatureReadings = 0;

        for (String name : teamNames) {
            teams.add(new Team(name));
        }
    }

    public ArrayList<Team> getTeams() {
        return teams;
    }

    public void addGame(Game game) {
        games.add(game);
        int temp = game.getTemperature();
        hottestTemperature = Math.max(hottestTemperature, temp);
        totalTemperature += temp;
        temperatureReadings++;
    }

    public void printSeasonResults() {
        System.out.println("*RESULTS*");
        for (Team team : teams) {
            team.printStats();
        }
        for (Game game : games) {
            game.printGameResult();
        }
        System.out.println("Hottest Temp: " + hottestTemperature);
        System.out.println("Average Temp: " + (temperatureReadings == 0 ? 0 : (totalTemperature /
temperatureReadings)));
    }
}

public class Scheduler {
    private League league;
    private int freezingWeeks;

    public Scheduler(String[] teamNames) {
        league = new League(teamNames);
        freezingWeeks = 0;
    }

    public void startSeason() {
        Scanner scanner = new Scanner(System.in);
        Random rand = new Random();

        while (true) {
            System.out.print("Enter temperature: ");
            int temperature;
            try {
                temperature = Integer.parseInt(scanner.nextLine());
            } catch (NumberFormatException e) {
                System.out.println("Invalid input. Please enter a valid temperature.");
                continue;
            }

            if (temperature <= 32) {
```

```
            freezingWeeks++;
            System.out.println("Too cold to play.");
            if (freezingWeeks >= 3) {
                System.out.println("Season is over");
                break;
            }
        } else {
            freezingWeeks = 0;
            playGames(temperature, rand);
        }
    }

    league.printSeasonResults();
}

private void playGames(int temperature, Random rand) {
    ArrayList<Team> teams = league.getTeams();
    int numGames = 2; // 2 games every Tuesday
    while (numGames > 0) {
        int team1Index = rand.nextInt(teams.size());
        int team2Index;
        do {
            team2Index = rand.nextInt(teams.size());
        } while (team2Index == team1Index);

        Team team1 = teams.get(team1Index);
        Team team2 = teams.get(team2Index);

        Game game = new Game(team1, team2, temperature);
```

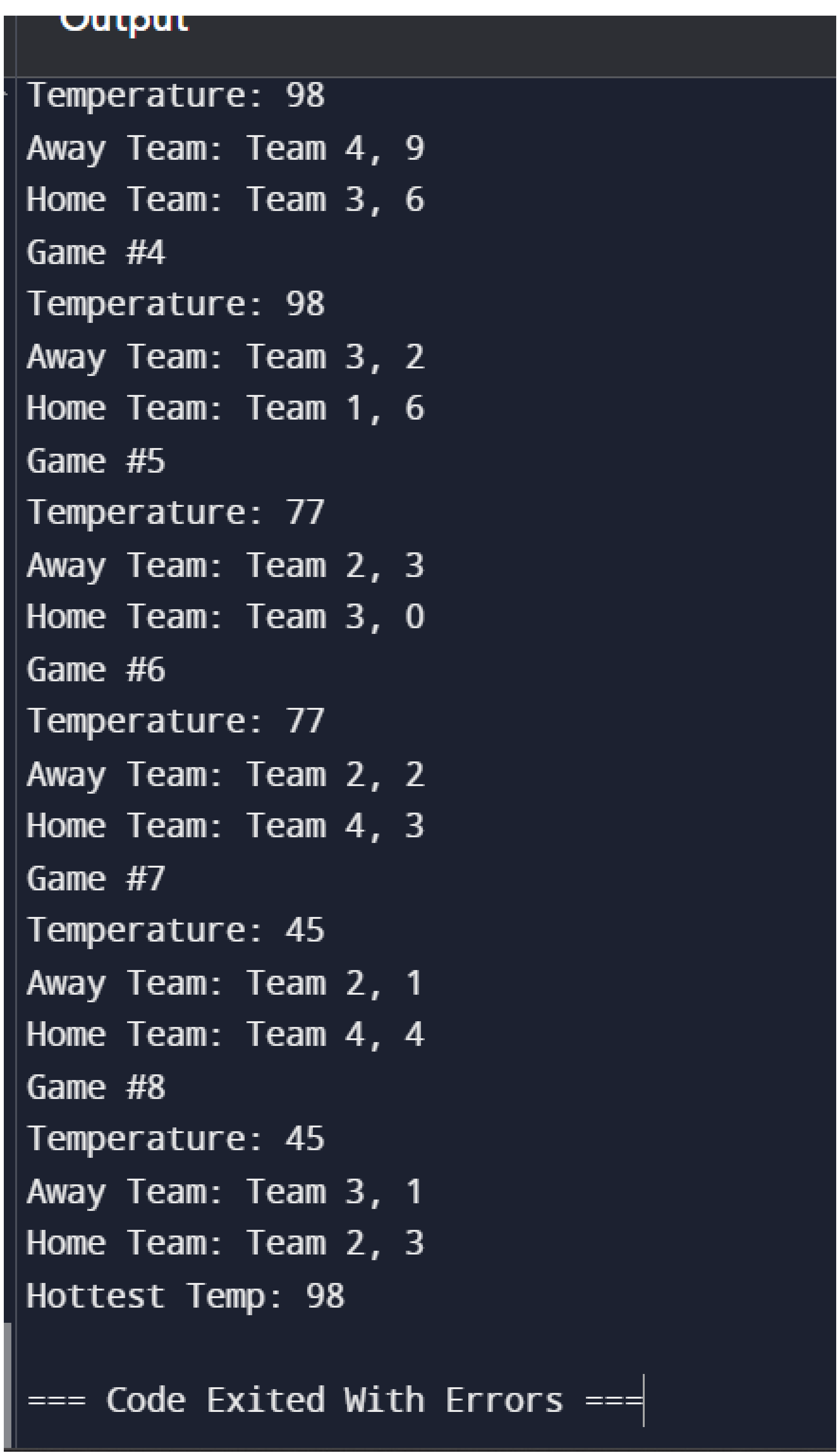
```
            league.addGame(game);
            numGames--;
        }
    }

    public static void main(String[] args) {
        String[] teamNames = {"Team 1", "Team 2", "Team 3", "Team 4"};
        Scheduler scheduler = new Scheduler(teamNames);
        scheduler.startSeason();
    }
}
```


Output

```
java -cp /tmp/kje2nRblvH/Scheduler
Enter temperature: 57
Enter temperature: 98
Enter temperature: 77
Enter temperature: 45
Enter temperature: 10
Too cold to play.
Enter temperature: 10
Too cold to play.
Enter temperature: 32
Too cold to play.
Season is over
*RESULTS*
Team Team 1
Wins: 1, Losses: 1, Ties: 0
Goals Scored: 7, Goals Allowed: 4
Team Team 2
Wins: 2, Losses: 3, Ties: 0
Goals Scored: 9, Goals Allowed: 12
Team Team 3
Wins: 1, Losses: 4, Ties: 0
Goals Scored: 11, Goals Allowed: 22
Team Team 4
Wins: 4, Losses: 0, Ties: 0
Goals Scored: 20, Goals Allowed: 9
Game #1
```



```
Team Team 4
Wins: 4, Losses: 0, Ties: 0
Goals Scored: 20, Goals Allowed: 9
Game #1
Temperature: 57
Away Team: Team 4, 4
Home Team: Team 2, 0
Game #2
Temperature: 57
Away Team: Team 3, 2
Home Team: Team 1, 1
Game #3
Temperature: 98
Away Team: Team 4, 9
Home Team: Team 3, 6
Game #4
Temperature: 98
Away Team: Team 3, 2
Home Team: Team 1, 6
Game #5
Temperature: 77
Away Team: Team 2, 3
Home Team: Team 3, 0
Game #6
Temperature: 77
Away Team: Team 2, 2
```


Output

```
Temperature: 98
Away Team: Team 4, 9
Home Team: Team 3, 6
Game #4
Temperature: 98
Away Team: Team 3, 2
Home Team: Team 1, 6
Game #5
Temperature: 77
Away Team: Team 2, 3
Home Team: Team 3, 0
Game #6
Temperature: 77
Away Team: Team 2, 2
Home Team: Team 4, 3
Game #7
Temperature: 45
Away Team: Team 2, 1
Home Team: Team 4, 4
Game #8
Temperature: 45
Away Team: Team 3, 1
Home Team: Team 2, 3
Hottest Temp: 98

=== Code Exited With Errors ===
```