Follow Me Lab 09: Implementing the JudgeSteakDoneness Class

CPSC1100

Objective

In this lab, you will create a Java class `JudgeSteakDoneness` that evaluates the doneness of a steak based on two criteria: inner temperature and cook time per side. The class will have no instance variables but will define constants for various doneness levels, appearances, and textures. Additionally, you will implement four equivalent methods for each catalog (temperature and cook time) using different decision-making structures.

Class Design

1. **Class Name**: `JudgeSteakDoneness`
2. **Constants**:
   - The class should define `String` constants for:
     - Doneness levels (`ULTRA_RARE`, `BLUE_RARE`, `RARE`, `MEDIUM_RARE`, `MEDIUM`, `MEDIUM_WELL`, `WELL_DONE`)
     - Corresponding appearance and texture descriptions.
3. **Method Catalog 1**: Methods for judging doneness based on **inner temperature**.
4. **Method Catalog 2**: Methods for judging doneness based on **cook time per side**.
5. **Decision-Making Structures**: Implement the methods using the following structures:
   - Multiple alternatives with **dependent conditions**.
   - Multiple alternatives with **independent conditions**.
   - **Independent decision-making** statements.
   - **Nested decision-making** statements.

Part 1: Constants in the Class

Define constants in the `JudgeSteakDoneness` class for the doneness levels and their respective appearance and texture.

Part 2: Methods for Judging Doneness by Inner Temperature

- **Multiple Alternatives with Dependent Conditions**: Implement a method to judge doneness using multiple alternatives where the conditions are dependent on the inner temperature range.
- **Multiple Alternatives with Independent Conditions**: Implement a method to judge doneness using independent conditions that check separate temperature ranges.
- **Independent Decision-Making**: Implement a method using completely independent `if` statements.
- **Nested Decision-Making**: Implement a method with nested decision-making statements to determine the doneness level.

Part 3: Methods for Judging Doneness by Cook Time

Repeat the same four decision-making approaches, but use **cook time per side** (in minutes) to determine the doneness level:

- Multiple alternatives with **dependent conditions** for cook time.
- Multiple alternatives with **independent conditions** for cook time.
- **Independent decision-making** for cook time.
- **Nested decision-making** for cook time.

Submission Instructions

- Implement the class `JudgeSteakDoneness` in your Java project.
- Provide comments for each decision-making approach.
- Test your class by creating a driver class that calls these methods and outputs the result for different inner temperatures and cook times.

FYI: Steak Doneness Levels

1. **Ultra Rare (Super Rare)**:
   Internal temperature: Below 115°F (46°C)
   Appearance: Extremely red, cool center
   Cook time: Sear for about 30 seconds to 1 minute per side
   Texture: Nearly raw, exceptionally soft and gelatinous

2. **Blue Rare (Extra Rare or "Bleu")**:
   Internal temperature: 115-120°F (46-49°C)
   Appearance: Cool, very red center
   Cook time: Sear for about 1 minute per side
   Texture: Extremely soft, almost raw, very juicy

3. **Rare**:
   Internal temperature: 120-125°F (49-52°C)
   Appearance: Cool red center
   Cook time: Sear for about 2-3 minutes per side
   Texture: Very soft and tender, with a lot of moisture

4. **Transition from Rare to Medium Rare**:
   Internal temperature: 125-130°F (52-54°C)
   Appearance: The red center warms slightly, with a bit more firmness
   Cook time: Sear for about 3 minutes per side
   Texture: Slightly firmer than rare, with moisture still prominent

5. **Medium Rare**:
   Internal temperature: 130-135°F (54-57°C)
   Appearance: Warm red center
   Cook time: Sear for about 3-4 minutes per side
   Texture: Slightly firmer than rare, still juicy and tender

6. **Transition from Medium Rare to Medium**:
   Internal temperature: 135-140°F (57-60°C)
   Appearance: The red center fades to pink, with more firmness
   Cook time: Sear for about 4 minutes per side
   Texture: Becoming slightly less juicy but still tender

7. **Medium**:
   Internal temperature: 140-145°F (60-63°C)
   Appearance: Warm pink center
   Cook time: Sear for about 4-5 minutes per side
   Texture: Firmer than medium-rare, balanced juiciness and tenderness

8. **Transition from Medium to Medium Well**:
   Internal temperature: 145-150°F (63-66°C)
   Appearance: Warm center begins to lose its pink color
   Cook time: Sear for about 5 minutes per side
   Texture: Slightly firmer, less juicy than Medium, but not fully dry

9. **Medium Well**:
   Internal temperature: 150-155°F (66-68°C)
   Appearance: Slightly pink center
   Cook time: Sear for about 5-6 minutes per side
   Texture: Less juicy and more firm than Medium, with only a hint of pink

10. **Transition from Medium Well to Well Done**:
    Internal temperature: 155-160°F (68-71°C)
    Appearance: Faint pink center fading completely
    Cook time: Sear for about 6 minutes per side
    Texture: Firm, becoming drier as the pink fades completely

11. **Well Done**:
    Internal temperature: 160°F (71°C) and above
    Appearance: No pink, fully cooked through
    Cook time: Sear for about 6-7 minutes per side
    Texture: Firm and dry, with very little juice remaining