BMI Calculator — Documentation

1. Title

BMI (Body Mass Index) Calculator — Developed in Thonny (Python)

2. Objective

This program calculates the Body Mass Index (BMI) based on the user's weight and height, and classifies the result into standard health categories (Underweight, Normal, Overweight, Obesity). It is useful for educational purposes and basic health assessment.

3. Requirements

- Thonny IDE (or any Python 3 environment)
- Python 3.x installed
- Basic Python knowledge (input, print, if/else, float conversion)

4. How to Use

1. Open Thonny IDE.
2. Create a new Python file (e.g., `bmi_calculator.py`).
3. Paste the code provided below.
4. Run the program by clicking **Run** or pressing **F5**.
5. Enter your weight (in kilograms) and height (in centimeters) when prompted.
6. The program will display your BMI and health category.

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5. Sample Code

```
python
# BMI Calculator - Thonny (Python 3)
def get_float_input(prompt):
    while True:
        try:
            value = float(input(prompt))
            if value <= 0:
                print("Please enter a number greater than 0.")
                continue
            return value
        except ValueError:
            print("Invalid input — please enter a number.")

def calculate_bmi(weight_kg, height_m):
```

```
    bmi = weight_kg / (height_m ** 2)
    return bmi

def bmi_category(bmi):
    if bmi < 18.5:
        return "Underweight"
    elif bmi < 25:
        return "Normal"
    elif bmi < 30:
        return "Overweight"
    else:
        return "Obesity"

def main():
    print("=== BMI Calculator ===")
    weight = get_float_input("Enter your weight (kg): ")
    height_cm = get_float_input("Enter your height (cm): ")
    height_m = height_cm / 100.0

    bmi = calculate_bmi(weight, height_m)
    category = bmi_category(bmi)

    print("\n----- Result -----")
    print(f"Your BMI: {bmi:.2f}")
    print(f"Category: {category}")

if __name__ == "__main__":
    main()
```

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6. Code Explanation (Step-by-Step)

- **`get_float_input(prompt)`**: Safely takes a numeric input from the user, ensuring it is a valid positive number.
- **`calculate_bmi(weight_kg, height_m)`**: Uses the BMI formula:

  BMI=weight (kg)height (m)2BMI = \frac{\text{weight (kg)}}{\text{height (m)}^2}BMI=height (m)2weight (kg)

- **`bmi_category(bmi)`**: Classifies BMI into categories:
  - `< 18.5` → Underweight
  - `18.5 - 24.9` → Normal
  - `25 - 29.9` → Overweight
  - `≥ 30` → Obesity
- **`main()`**: Collects input, calculates BMI, and prints the result.
- **`if __name__ == "__main__":`** ensures the program runs only when executed directly.

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7. Sample Run

Input:

```
java
CopyEdit
Enter your weight (kg): 70
Enter your height (cm): 175
```

Output:

```
yaml
CopyEdit
Your BMI: 22.86
Category: Normal
```

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8. Test Cases

Weight (kg)	Height (cm)	BMI	Category
50	170	17.30	Underweight
60	165	22.04	Normal
85	170	29.41	Overweight
95	165	34.90	Obesity

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9. Input Validation & Error Handling

- Ensures all numeric inputs are **float** values and positive.
- Displays an error message for invalid or zero/negative inputs.
- Prevents the program from crashing due to `ValueError`.

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10. Possible Improvements

- Add a GUI using **Tkinter** or **PyQt**.
- Accept height in both meters and centimeters (with unit detection).
- Include a pounds-to-kilograms conversion option.
- Provide health tips or recommendations based on BMI.
- Save results to a text or CSV file for records.

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11. Troubleshooting

- **Issue**: Program crashes with `ValueError`.
  Fix: Enter only numbers (not letters or symbols).
- **Issue**: Height entered in meters instead of centimeters gives incorrect results.
  Fix: Adjust the code or ensure height is entered in centimeters.

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12. Conclusion

This BMI Calculator is a simple yet useful project created in Thonny using Python.
It demonstrates the use of **functions**, **input validation**, and **conditional statements**, and can be expanded with more features like GUI, file storage, and unit conversion.

13. Screenshots

- **Underweight:**

```
30      height_cm = get_float_input("Enter your height (cm): ")
31      height_m = height_cm / 100.0
32
33      bmi = calculate_bmi(weight, height_m)
```

Shell

```
>>> %Run -c $EDITOR_CONTENT
 === BMI Calculator ===
 Enter your weight (kg): 50
 Enter your height (cm): 170

 ----- Result -----
 Your BMI: 17.30
 Category: Underweight
>>>
```

- **Normal:**

Shell

```
>>> %Run -c $EDITOR_CONTENT
 === BMI Calculator ===
 Enter your weight (kg): 60
 Enter your height (cm): 175

 ----- Result -----
 Your BMI: 19.59
 Category: Normal
>>>
```

- **Overweight:**

Shell

```
>>> %Run -c $EDITOR_CONTENT
 === BMI Calculator ===
 Enter your weight (kg): 85
 Enter your height (cm): 170

 ----- Result -----
 Your BMI: 29.41
 Category: Overweight
>>>
```

- **Obesity**

Shell

```
>>> %Run -c $EDITOR_CONTENT
 === BMI Calculator ===
 Enter your weight (kg): 95
 Enter your height (cm): 165

 ----- Result -----
 Your BMI: 34.89
 Category: Obesity
>>>
```