# ***BMI CALCULATOR APPLICATION***

## 1. What Are We Building?

We are building a BMI Calculator Web Application.

It is a health-related application where users can:

- ⚖️ Enter their weight in kilograms
- 📏 Enter their height in centimeters
- 👤 Select their gender
- 🎂 Enter their age
- 📊 Calculate their Body Mass Index (BMI)
- ✅ View their BMI category
- 💪 Check their healthy weight range
- 📈 See additional health indicators such as BMI Prime and Ponderal Index

The application runs inside the browser with Flask handling the backend calculations.

## 2. Technologies Used

| Technology | What it is used for |
|---|---|
| Python | Main programming language |
| Flask | Creates the backend and handles calculations |
| HTML | Creates the webpage structure |
| CSS | Makes the application visually attractive |
| Jinja2 | Displays calculated results dynamically |

## 3. Before Starting (Setup)

Step 3.1: Install Python

Download from:

https://www.python.org

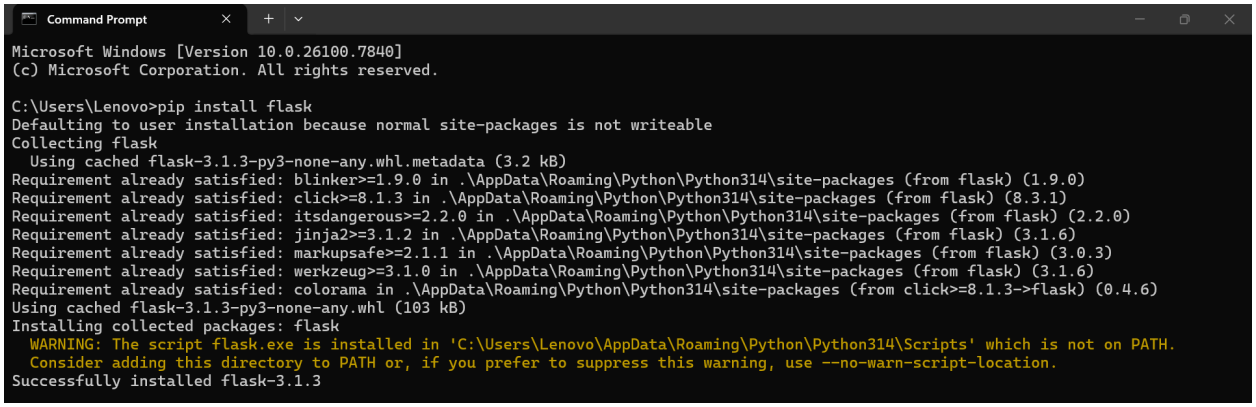
While installing, check:

✅ Add Python to PATH

Step 3.2: Install Flask

Open Command Prompt or Terminal and type:

```
pip install flask
```




This installs Flask, which is required to run the application.

## 4. Create Project Structure

Create a folder named `BMICalculator`

Inside it, create:

## 5. Backend Development

File: `app.py`

This file acts as the backend of the application.

It performs:

- User input processing
- BMI calculations
- BMI category determination
- Healthy weight calculations
- Result generation

Step 5.1: Import Required Modules

```
from flask import Flask, render_template, request
```

These help to:

- Create the Flask application
- Display HTML pages
- Receive form data submitted by users

Step 5.2: Create Flask Application

```
app = Flask(__name__)
```

Initializes the Flask application.

Step 5.3: Create Home Route

```
@app.route("/", methods=["GET", "POST"])
def index():
```

This route:

- Displays the calculator page

- Accepts user input
- Performs BMI calculations

Step 5.4: Receive User Inputs

```
age = int(request.form["age"])
gender = request.form["gender"]
height_cm = float(request.form["height"])
weight = float(request.form["weight"])
```

Collects:

- Age
- Gender
- Height
- Weight

entered by the user.

Step 5.5: Convert Height

```
height_m = height_cm / 100
```

Converts height from centimeters to meters.

Example:

170 cm → 1.70 m

Step 5.6: Calculate BMI

```
bmi = weight / (height_m ** 2)
```

BMI Formula:

```
BMI = Weight (kg) ÷ Height² (m²)
```

Step 5.7: Determine BMI Category

```
if bmi < 18.5:
```

```
    category = "Underweight"
elif bmi < 25:
    category = "Normal"
elif bmi < 30:
    category = "Overweight"
else:
    category = "Obese"
```

Categories:

| BMI Range | Category |
|---|---|
| Below 18.5 | Underweight |
| 18.5 – 24.9 | Normal |
| 25 – 29.9 | Overweight |
| 30 and above | Obese |

Step 5.8: Calculate Healthy Weight Range

```
min_weight = 18.5 * (height_m ** 2)
max_weight = 25 * (height_m ** 2)
```

This calculates the healthy weight range for the user's height.

Step 5.9: Calculate BMI Prime

```
bmi_prime = bmi / 25
```

BMI Prime compares the user's BMI with the upper limit of the healthy BMI range.

Interpretation:

- `Less than 0.74 → Underweight`
- `0.74 - 1.00 → Healthy`
- `Above 1.00 → Overweight`

Step 5.10: Calculate Ponderal Index

```
ponderal = weight / (height_m ** 3)
```

Ponderal Index is another measurement used to assess body composition.

Step 5.11: Store Results

```
result = {
    "bmi": round(bmi,1),
    "category": category,
    "min_weight": round(min_weight,1),
    "max_weight": round(max_weight,1),
    "bmi_prime": round(bmi_prime,2),
    "ponderal": round(ponderal,2)
}
```

Stores all calculated values.

Step 5.12: Display Results

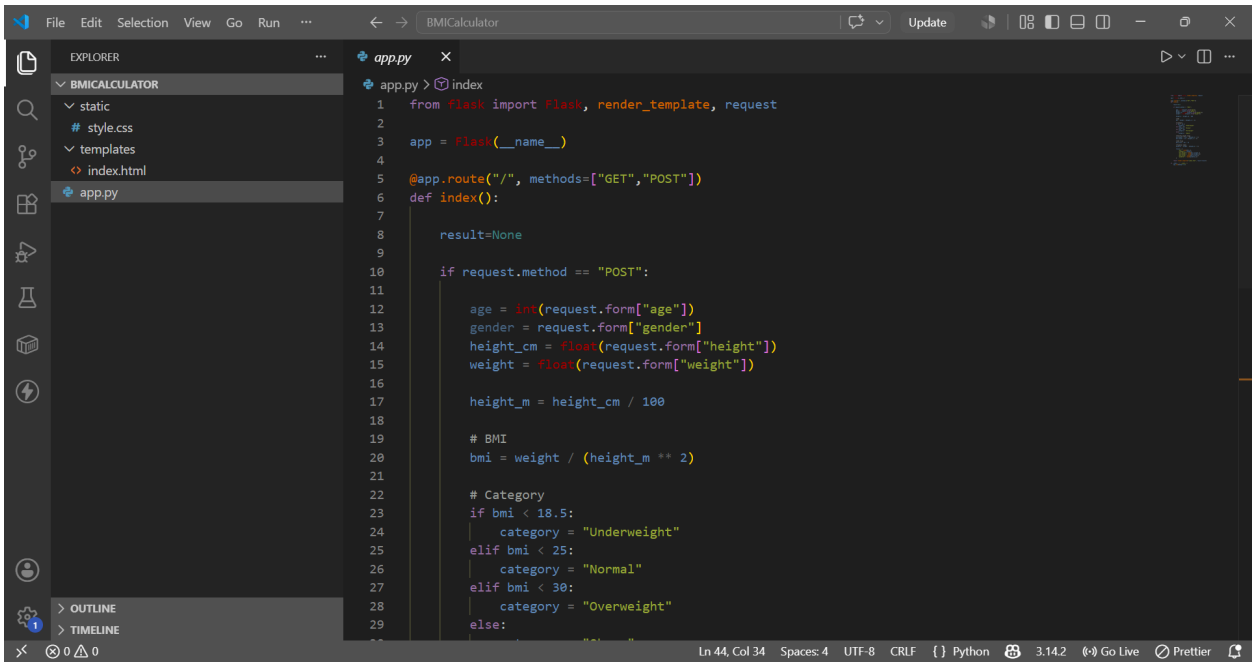
```
return render_template("index.html", result=result)
```

Sends the results to the webpage.

Step 5.13: Run Application

```
if __name__ == "__main__":
    app.run(debug=True)
```

Starts the Flask server.




## 6. Frontend Development

File: `index.html`

This file creates:

- Input form
- Gender selection
- Calculate button
- Results section

Step 6.1: Add Page Title

```
<title>BMI Calculator</title>
```

Set the browser tab title.

Step 6.2: Connect CSS File

```
<link
rel="stylesheet"
href="{{ url_for('static', filename='style.css') }}"
```

```
/>
```

Links the stylesheet.

Step 6.3: Create Main Container

```
<div class="container">
```

Holds all page elements.

Step 6.4: Add Heading

```
<h1>BMI Calculator</h1>
```

Displays the application title.

Step 6.5: Create Form

```
<form method="POST">
```

Allows users to submit their details.

Step 6.6: Age Input

```
<input type="number" name="age" required />
```

Collects user's age.

Step 6.7: Gender Selection

```
<input type="radio" name="gender" value="male" required />
<input type="radio" name="gender" value="female" />
```

Allows users to select gender.

Step 6.8: Height Input

```
<input
type="number"
step="any"
name="height"
placeholder="Height (cm)"
required
/>
```

Collects height in centimeters.

Step 6.9: Weight Input

```
<input
type="number"
step="any"
name="weight"
placeholder="Weight (kg)"
required
/>
```

Collects weight in kilograms.

Step 6.10: Calculate Button

```
<button type="submit">
Calculate
</button>
```

Submit the form.

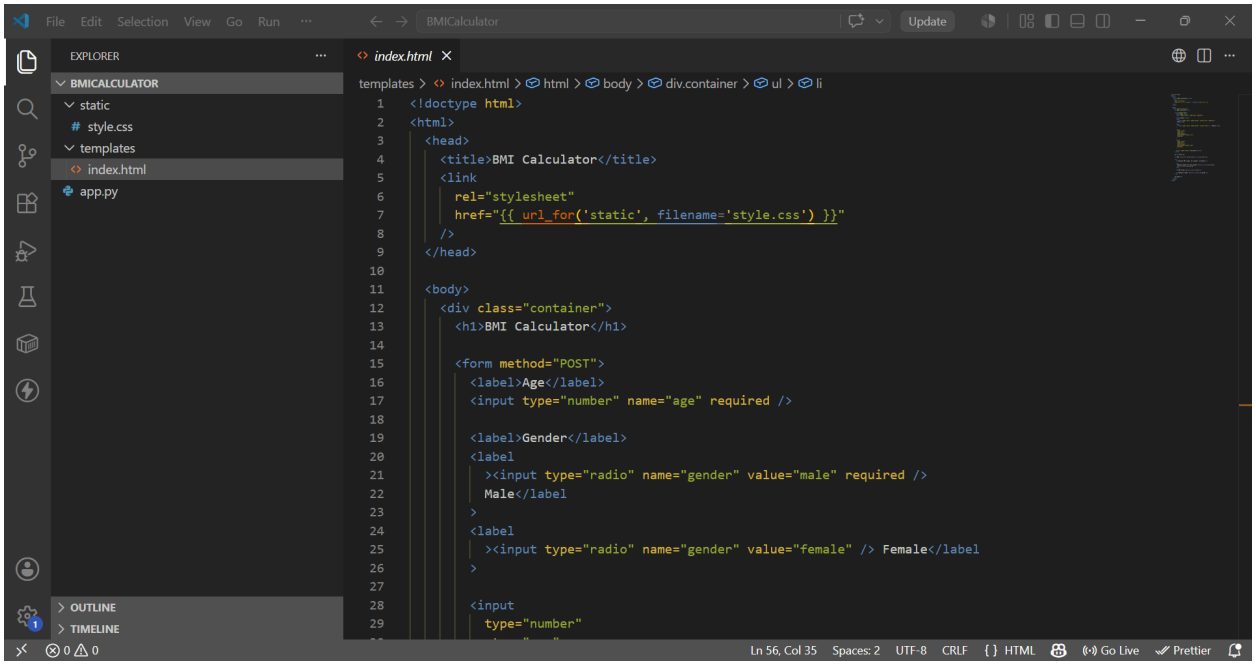
Step 6.11: Display Results

```
{% if result %}
```

Shows results only after calculation.

Displays:

- BMI value
- BMI category
- Healthy BMI range
- Healthy weight range
- BMI Prime
- Ponderal Index




## 7. Styling

File: `style.css`

This file improves the appearance of the calculator.

Step 7.1: Style Page

```
body {
  font-family: Arial;
```

```
}
```

Uses Arial font throughout the application.

Step 7.2: Add Background Gradient

```
background:
linear-gradient(
120deg,
#f6d365,
#fda085
);
```

Creates an attractive background.

Step 7.3: Center Content

```
display: flex;
justify-content: center;
align-items: center;
```

Center the calculator on the page.

Step 7.4: Style Container

```
.container {
  background: white;
}
```

Creates a card-like appearance.
Additional styling includes:

- Rounded corners
- Padding
- Shadow effects

Step 7.5: Style Input Fields

```
input {
  padding: 10px;
}
```

Improves usability.

Additional styling adds:

- Rounded borders
- Proper spacing
- Consistent sizing

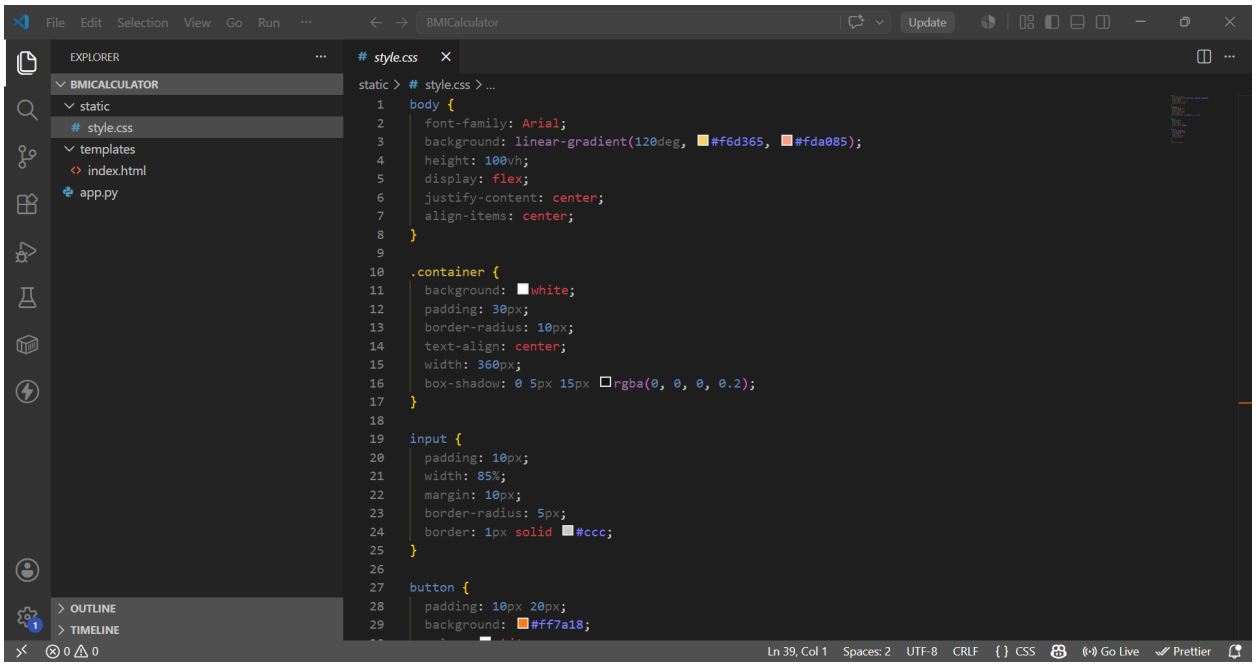
Step 7.6: Style Button

```
button {
  background: #ff7a18;
  color: white;
}
```

Creates an attractive Calculate button.

Features include:

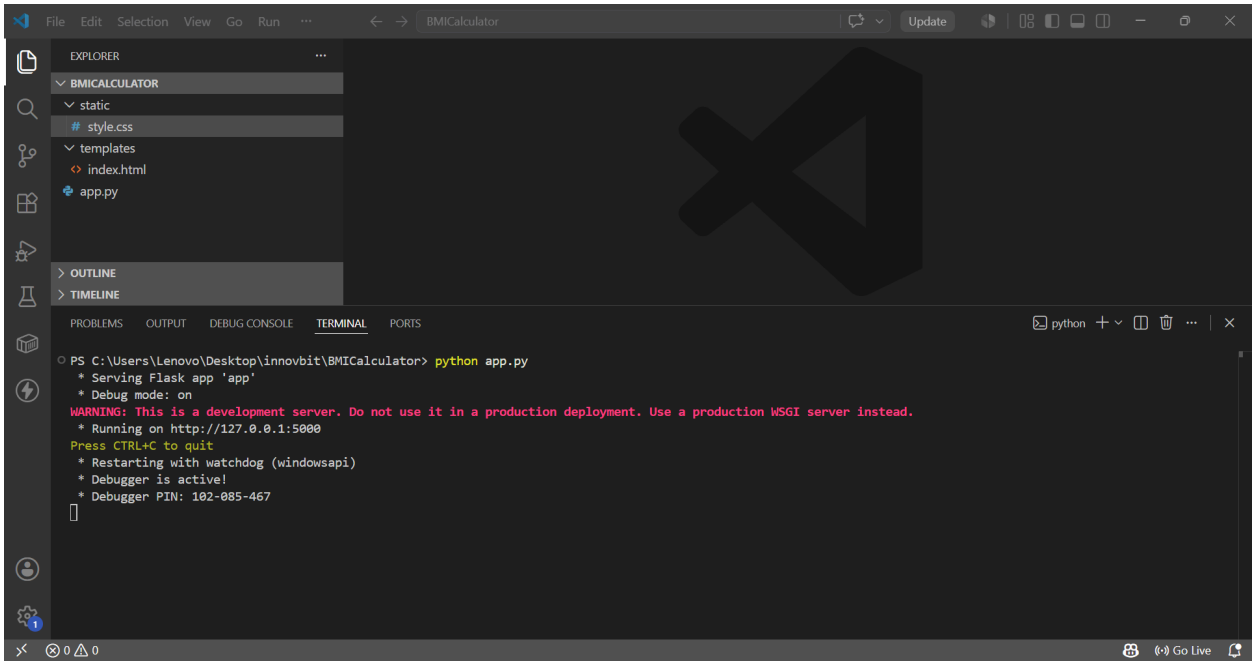
- Rounded corners
- Pointer cursor
- Better visual appeal




## 8. Run the App

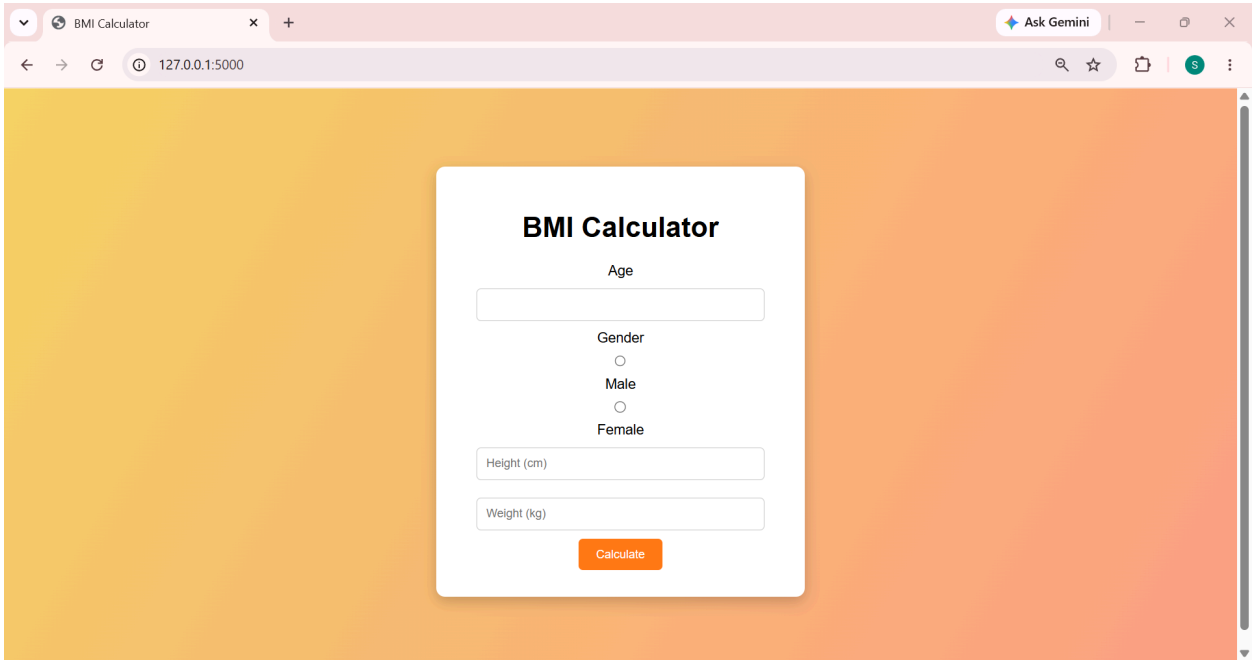
Open terminal inside the project folder:

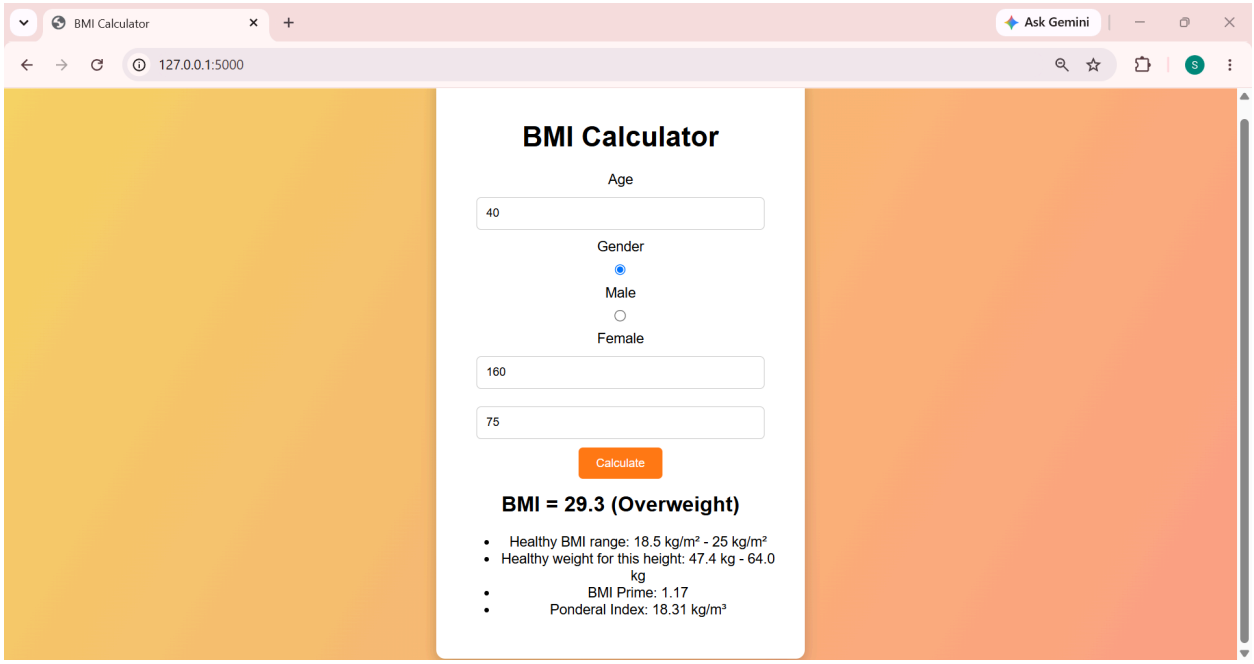
```
python app.py
```

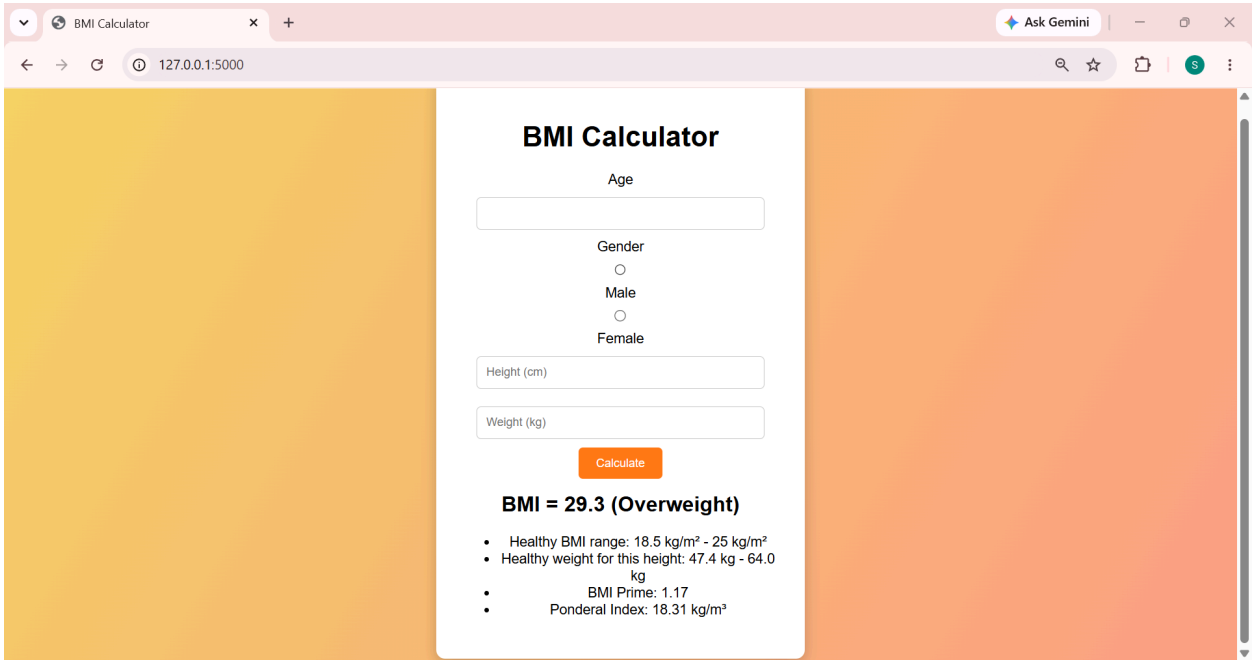


Then open the browser and visit:

`http://127.0.0.1:5000`






## 9. How Everything Works Together (Flow)

- The user opens the website.
- Flask loads `index.html`.
- User enters:
  - Age
  - Gender
  - Height
  - Weight
- User clicks Calculate.
- Form data is sent to Flask.
- Flask calculates:
  - BMI
  - BMI category
  - Healthy weight range
  - BMI Prime
  - Ponderal Index
- Results are stored.

- Results are displayed on the webpage.

## 10. Common Mistakes

- Forgetting to install Flask
- Incorrect folder names (templates, static)
- Not connecting the CSS file properly
- Using wrong input names
- Forgetting to convert height from cm to meters
- Not running app.py from the project directory
- Forgetting debug=True during development

## 11. Tips & Tricks

### 11.1 Add Input Validation

Prevent negative values for:

- Height
- Weight
- Age

### 11.2 Add Reset Button

Example:

```
<button type="reset">
```

Clear

```
</button>
```

Clears all inputs.

### 11.3 Improve UI

You can:

- Use Bootstrap
- Add icons

- Add animations
- Include charts

11.4 Add Health Recommendations

Provide suggestions based on BMI category.

Example:

- Underweight → Nutritional guidance
- Overweight → Exercise recommendations

11.5 Store User History

Save previous BMI records using:

- SQLite
- MySQL
- Local Storage

## 12. Final Summary

This project teaches:

- Flask basics
- HTML forms
- CSS styling
- Handling POST requests
- Processing user input
- Performing health-related calculations
- Dynamic webpage rendering using Jinja2

It is an excellent beginner project for learning how frontend and backend technologies work together to build practical healthcare applications.