# Malnutrition Prediction Tool for Critically Ill Patients

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A machine learning-based tool for early prediction of malnutrition risk in ICU patients. Built with Python and XGBoost.

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## Installation

### Prerequisites

- Python 3.8+

- pip

### Steps

1. Clone the repository:

```bash

git clone https://github.com/yourusername/malnutrition-prediction.git

cd malnutrition-prediction

1. Install dependencies:

bash

pip install -r requirements.txt

1. (Optional) For Docker users:

bash

docker build -t malnutrition-tool .

docker run -p 5000:5000 malnutrition-tool

**Quick Start**

1. **Prepare Input Data**  
   Use the sample input file [sample\_input.csv](https://data/sample_input.csv):

csv

Age,BMI,Albumin,Hemoglobin,Reduced\_Energy\_Intake

65,22.5,3.0,11.0,Yes

1. **Run Prediction**  
   Execute the script:

bash

python predict.py --input data/sample\_input.csv --output results.csv

1. **View Results**  
   Output file results.csv will contain:

csv

Patient\_ID,Predicted\_Risk,Probability

1,Severe Malnutrition,0.92

**Input Format**

**Required Fields**

| **Column Name** | **Type** | **Unit/Range** | **Example** |
| --- | --- | --- | --- |
| Age | int | Years | 65 |
| BMI | float | kg/m² | 22.5 |
| Albumin | float | g/dL | 3.0 |
| Hemoglobin | float | g/dL | 11.0 |
| Reduced\_Energy\_Intake | str | "Yes"/"No" | Yes |

**Optional Fields**

* IL6 (float, pg/mL)
* CRP (float, mg/L)
* Platelet\_Count (int, ×10³/μL)

**Run the Tool**

**Command-Line Interface (CLI)**

bash

*# Basic usage*

python predict.py --input <input\_file> --output <output\_file>

*# Example with optional flags*

python predict.py --input data/patients.csv --output results.csv --verbose

**Web Interface (Flask)**

1. Start the server:

bash

python app.py

1. Access via browser:  
   [http://localhost:5000](http://localhost:5000/)

**Troubleshooting**

| **Issue** | **Solution** |
| --- | --- |
| ModuleNotFoundError | Run pip install -r requirements.txt |
| Invalid input format | Check CSV headers match Input Format |
| Server not starting (Port 5000) | Ensure no other app is using the port. |
| Slow prediction | Disable --verbose mode for faster runs. |

**Contributing**

1. Fork the repository.
2. Create a branch: git checkout -b feature/your-idea.
3. Submit a pull request.  
   See [CONTRIBUTING.md](https://contributing.md/) for details.

**License**

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