# Right Triangle Solver for CNC Machinists

```
## Overview
The Right Triangle Solver is a Python utility designed for CNC machinists to calculate the missing sides a
## Features
- **Input Flexibility**: Accepts any two known values: sides `a` (adjacent), `b` (opposite), `c` (hypotenu
- **Precision**: Outputs rounded to 4 decimal places, suitable for CNC tolerances.
- **Validation**: Ensures valid inputs (positive sides, angles 0°-90°).
- **Units**: Supports inches or millimeters (user-specified, consistent units assumed).
- **Error Handling**: Catches invalid inputs or impossible triangles.
## Requirements
- Python 3.x (no external libraries required).
- A terminal or command-line interface (e.g., on a shop floor laptop or tablet).
## Installation
1. Save the script as `right_triangle_solver.py`.
2. Ensure Python 3 is installed on the target device (e.g., `python3 --version`).
3. No additional dependencies are needed.
## Usage
1. Run the script:
   ```bash
   python3 right_triangle_solver.py
2. Enter exactly two known values when prompted (press Enter for unknown values).
3. View the calculated sides (`a`, `b`, `c`) and angles (`A`, `B`, `C`).
### Example
  `plaintext
Right Triangle Solver for CNC Machinist
Enter any two known values (leave others blank with Enter).
Sides (a, b, c) in inches/mm, Angles (A, B) in degrees.
a: adjacent, b: opposite, c: hypotenuse, A: angle opp. a, B: angle opp. b
a: 3.5
b: 4.0
с:
A:
B:
Triangle Solution:
a (adjacent): 3.5 inches/mm
b (opposite): 4.0 inches/mm
c (hypotenuse): 5.3151 inches/mm
A: 41.1859 degrees
B: 48.8141 degrees
C: 90.0 degrees
## Notes
- Ensure consistent units (e.g., all sides in inches or millimeters).
- The script is standalone and portable for shop floor use.
- For a GUI version or file output, contact the developer for enhancements.
## Limitations
- Assumes a right triangle (angle `C` is fixed at 90°).
- Does not support negative angles or sides (not typical in machining).
## License
MIT License. Free to use and modify for shop floor applications.
## Contact
For support or feature requests, contact your shop's IT or engineering team.
```