

# Guide: Embed Python in C# Without Python Installed

## FULL GUIDE: Embedding Python in C# Without Requiring Python Installed

### PART 1: Setup Embedded Python Runtime

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#### 1. Download Embedded Python ZIP

- <https://www.python.org/ftp/python/3.9.13/python-3.9.13-embed-amd64.zip>

#### 2. Extract to `Python\_Runtime` folder in your C# project:

ConsoleApp1/

??? Python\_Runtime/

??? python39.dll

??? python39.\_pth

??? Lib/

??? DLLs/

#### 3. Edit `python39.\_pth` to include:

python39.zip

Lib

DLLs

.

import site

### PART 2: Add Required Python Packages

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#### 1. Use pip locally:

pip install pandas matplotlib pillow cython

#### 2. Copy site-packages from local Python to:

Python\_Runtime/Lib/site-packages/

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### PART 3: Convert `.py` to `.pyd` Using Cython

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Example file: `my\_math.py`

```
def add(a, b): return a + b
```

Create `setup.py`:

```
from setuptools import setup
```

```
from Cython.Build import cythonize
```

```
setup(  
    name="my_math",  
    ext_modules=cythonize("my_math.py", compiler_directives={"language_level": "3"})  
)
```

Then run:

```
python setup.py build_ext --inplace
```

Output: my\_math.cp39-win\_amd64.pyd

### PART 4: Place `.pyd` and CSV in Runtime Folder

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Python\_Runtime/

??? my\_math.cp39-win\_amd64.pyd

??? reuters\_fx\_data.csv

??? python39.dll

??? python39.\_pth

??? Lib/site-packages/

??? DLLs/

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### PART 5: Update .csproj for WinForms

```
-----  
<PropertyGroup>  
  <OutputType>WinExe</OutputType>  
  <TargetFramework>net6.0</TargetFramework>  
  <PlatformTarget>x64</PlatformTarget>  
  <Prefer32Bit>>false</Prefer32Bit>  
</PropertyGroup>  
  
<ItemGroup>  
  <FrameworkReference Include="Microsoft.WindowsDesktop.App.WindowsForms" />  
</ItemGroup>
```

### PART 6: C# Code to Load .pyd and Show Chart

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Refer to full C# example in prior chat for WinForms chart rendering using Python `.pyd`.

### FINAL STRUCTURE

```
-----  
ConsoleApp1.exe  
Python_Runtime/  
??? python39.dll  
??? python39._pth  
??? fx_plot.cp39-win_amd64.pyd  
??? reuters_fx_data.csv  
??? Lib/site-packages/  
??? DLLs/
```