

Dockerized Python Calculator Documentation

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1. Project Overview

This project demonstrates how to run a Python calculator inside a Docker container. Docker allows packaging an application along with its environment into a lightweight, portable container.

The calculator can perform:

- Addition (+)
- Subtraction (-)
- Multiplication (*)
- Division (/)

All computations are performed inside the Docker container.

2. File Structure

```
docker_calculator/
└── calculator.py
└── Dockerfile
```

3. Python Code: **calculator.py**

```
def add(a, b):  
    return a + b  
  
def subtract(a, b):  
    return a - b  
  
def multiply(a, b):  
    return a * b
```

```
def divide(a, b):

    if b != 0:

        return a / b

    else:

        return "Error: Division by zero"

def main():

    print("Simple Calculator")

    print("Select operation: +, -, *, /")

    operation = input("Enter operation: ")

    num1 = float(input("Enter first number: "))

    num2 = float(input("Enter second number: "))

    if operation == '+':

        print("Result:", add(num1, num2))

    elif operation == '-':

        print("Result:", subtract(num1, num2))

    elif operation == '*':

        print("Result:", multiply(num1, num2))

    elif operation == '/':

        print("Result:", divide(num1, num2))

    else:

        print("Invalid operation")

if __name__ == "__main__":

    main()
```

4. Dockerfile

```
# Use official Python image
FROM python:3.11-slim

# Set working directory inside container
WORKDIR /app

# Copy the Python script into container
COPY calculator.py .

# Command to run the Python script
CMD ["python", "calculator.py"]
```

```
(base) riyaparikh@Riyas-MacBook-Air ~ % cd docker_calculator
[
(base) riyaparikh@Riyas-MacBook-Air docker_calculator % ls
Dockerfile      calculator.py
(base) riyaparikh@Riyas-MacBook-Air docker_calculator % docker build -t python-calculator .

[+] Building 2.2s (9/9) FINISHED
      docker:desktop-linux
-> [internal] load build definition from Dockerfile          0.0s
=> => transferring dockerfile: 127B                         0.0s
=> [internal] load metadata for docker.io/library/python:3.11-slim 2.1s
=> [auth] library/python:pull token for registry-1.docker.io 0.0s
=> [internal] load .dockerignore                            0.0s
=> => transferring context: 2B                            0.0s
=> [1/3] FROM docker.io/library/python:3.11-slim@sha256:e4676722fba839e2 0.0s
=> => resolve docker.io/library/python:3.11-slim@sha256:e4676722fba839e2 0.0s
=> [internal] load build context                          0.0s
=> => transferring context: 35B                          0.0s
=> CACHED [2/3] WORKDIR /app                           0.0s
=> CACHED [3/3] COPY calculator.py .                   0.0s
=> exporting to image                                  0.0s
=> => exporting layers                                0.0s
=> => exporting manifest sha256:9168fbe105c9068d3fb450966d2da446cdeedafe 0.0s
=> => exporting config sha256:c19bb8defdc5976426b8f7732692eaf7835db27873 0.0s
=> => exporting attestation manifest sha256:55a80452c731e8514e26091a8ab9 0.0s
=> => exporting manifest list sha256:95f3020c8ca9e880873bd1839daca2b2c3 0.0s
=> => naming to docker.io/library/python-calculator:latest 0.0s
=> => unpacking to docker.io/library/python-calculator:latest 0.0s
```

OUTPUT:

```
(base) riyaparikh@Riyas-MacBook-Air docker_calculator % docker run -it python-calculator
Simple Calculator
Select operation: +, -, *, /
[Enter operation: *
[Enter first number: 34
[Enter second number: 65
Result: 2210.0
```