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# Intro to Using Docker with ActivitySim

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# Why Docker?

Developer

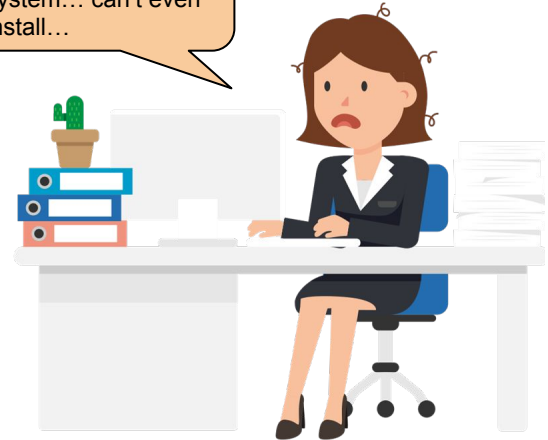
The code works perfectly fine!



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Tester

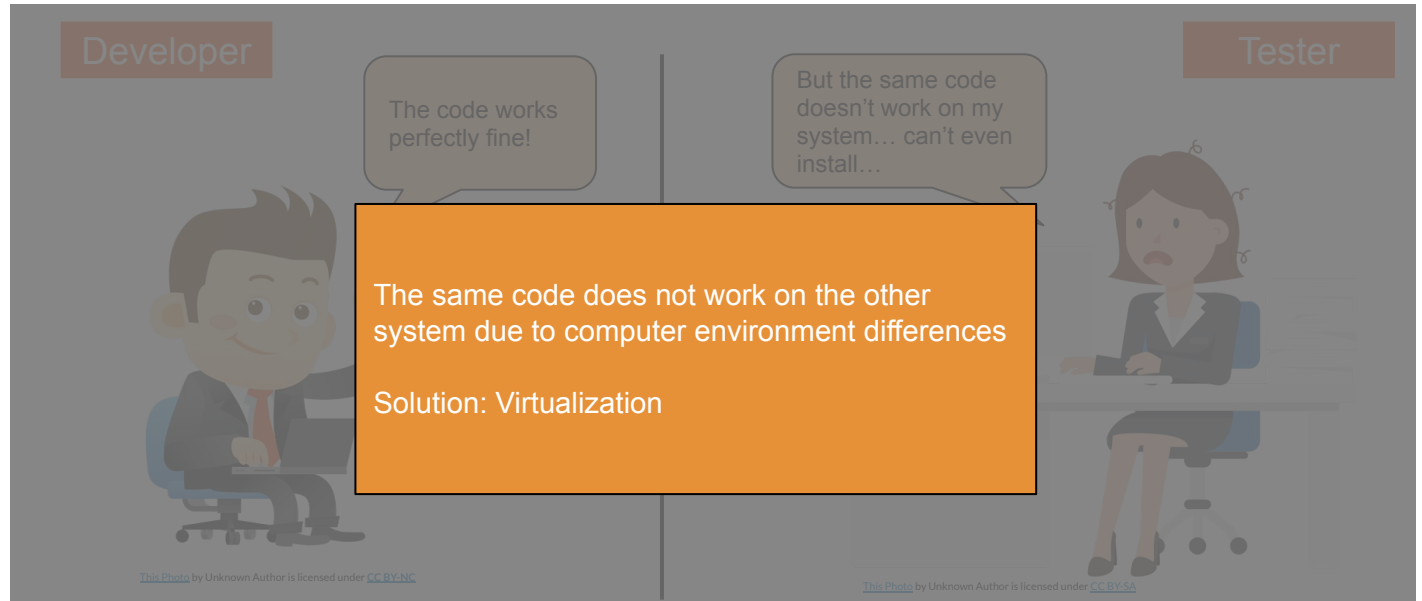
But the same code doesn't work on my system... can't even install...



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# Why Docker?



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# Docker, Docker Image, and Docker Container

**Docker** is an open platform for developing, shipping, and running applications. It binds and runs application and its dependencies inside a container.

**Docker Image** is a read-only template with instructions for creating a container of the application.

**Docker Container** is a runnable instance of an image. Applications run in Docker container.

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# Docker Image and Docker Container

## Docker Image

- **Shareable**
- **Stackable**
- **Customizable**
- **Command line:**
  - docker build - to build an image
  - docker push - to push an image to registry
  - docker pull - to use an image created by others and pushed to the registry

## Docker Container

- **Disposable**
  - **Command line:**
    - docker run - to launch a running container instance of the application
    - can define how the container is run, can attach storage to the container for I/O
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# How to use Docker with ActivitySim?

1. Development stage (for developers)

Features: editing code, building docker image, testing, releasing docker image

2. Deployment stage (for users)

Features: pull released docker image, run container

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# Prep work

- Install Docker (<https://docs.docker.com/desktop/>)
  - Developers
    - Make sure you have the ActivitySim repo cloned
    - Dockerfile (configuration for building docker image)
  - Users
    - All set
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# Deployment Stage (Users)

Step 1: Pull released ActivitySim image from registry

Step 2: Run docker container

Step 3: Run ActivitySim in container

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# Development Stage (Developers)

Step 1: Update local ActivitySim code

Step 2: Build Docker image of updated local ActivitySim code

Step 3: Test ActivitySim in container

Step 4: Iterate step 1-3

Step 5: Push ready-to-release ActivitySim image to registry

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# Summary: Using Docker for ActivitySim

## Pros:

1. No more ActivitySim installation issues
2. Release new versions as images
3. Moving towards cloud computing

## Cons:

1. Need to install Docker
  2. Additional overhead for developers
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