10. FID Calculation

```python
# Import sqrtm for matrix square root (needed for FID calculation)
from scipy.linalg import sqrtm
# Import numpy for numerical operations
import numpy as np
```

```python
# Function to calculate Fréchet Inception Distance (FID) between two distributions
def calculate_fid(mu1, sigma1, mu2, sigma2):
    # mu1, sigma1: mean and covariance of real images
    # mu2, sigma2: mean and covariance of generated images
    diff = mu1 - mu2   # difference between means
    covmean = sqrtm(sigma1.dot(sigma2))   # sqrt of product of covariances
    # FID formula: squared mean difference + trace of covariances minus twice the cross-covariance
    fid = diff.dot(diff) + np.trace(sigma1 + sigma2 - 2 * covmean)
    return np.real(fid)   # return real part in case of numerical errors
```

```python
# Generate random mean and identity covariance for two distributions (for demonstration)
mu1, sigma1 = np.random.rand(3), np.eye(3)
mu2, sigma2 = np.random.rand(3), np.eye(3)
```

```python
# Calculate and print the FID score using the generated means and covariances
print("FID Score:", calculate_fid(mu1, sigma1, mu2, sigma2))
```

FID Score: 0.2065036957728149