GENERATIVE AI TECHNICAL SKILLS

1. Programming Languages

- Python: The primary language for implementing generative AI models, with a vast ecosystem of libraries.
  - Key Libraries:
    - Keras/ TensorFlow: A high-level API for TensorFlow, simplifying the construction of generative networks.
    - PyTorch: A flexible library preferred for research and experimentation in generative models.

2. Core Generative Models

- Generative Adversarial Networks (GANs): Understanding the architecture and implementation of GANs, including variants like:
  - DCGAN (Deep Convolutional GANs)
  - CycleGAN: For image translation tasks.
  - StyleGAN: For generating high-quality images.
- Variational Autoencoders (VAEs): Knowledge of VAEs for generating new data instances similar to the training data.
- Autoregressive Models: Familiarity with models like PixelCNN, PixelSNAIL for image generation and language models like GPT (Generative Pre-trained Transformer).
- Transformers: Understanding the transformer architecture and its application in generative tasks, particularly in natural language processing (NLP).

3. Data Preprocessing and Augmentation

- Data Augmentation: Techniques for augmenting training datasets to improve the robustness of generative models (e.g., image rotation, flipping, and cropping).
- Text Processing: Techniques for preparing textual data, including tokenization, stemming, and using embeddings (Word2Vec, GloVe).

4. Model Training and Optimization

- Loss Functions: Understanding loss functions specific to generative models, such as Wasserstein loss for GANs.
- Optimization Algorithms: Familiarity with optimization techniques like Adam, SGD, and techniques to stabilize GAN training (e.g., using gradient penalty).

5. Model Evaluation

- Metrics: Knowledge of metrics to evaluate generative models, such as Inception Score (IS) and Fréchet Inception Distance (FID) for GANs.

- **A/B Testing: For assessing the performance of generative models in real-world applications.**

6. Deployment and Production

- **Model Deployment: Skills in deploying generative AI models using platforms like TensorFlow Serving, AWS SageMaker, or Google AI Platform.**
- **APIs: Creating RESTful APIs to serve generative models using frameworks like Flask or FastAPI.**
- **Containerization: Familiarity with Docker and Kubernetes for deploying generative AI applications.**

7. Version Control and Collaboration

- **Git: For version control and collaborative work in coding projects.**
- **Jupyter Notebooks: For prototyping and sharing work interactively.**

8. Cloud Computing

- **AWS: Utilizing services like EC2 (compute), S3 (storage), and SageMaker (machine learning).**
- **Google Cloud Platform: Using BigQuery, AutoML, and AI Platform for scalable solutions.**
- **Microsoft Azure: Leveraging Azure Machine Learning for model training and deployment.**

CERTIFICATION FOR GENERATIVE AI

1. Deep Learning Specialization (Coursera - Andrew Ng)

- Covers fundamental concepts in deep learning, including GANs and VAEs, using TensorFlow and Keras.

2. TensorFlow Developer Certificate

- Validates proficiency in building and deploying models using TensorFlow, focusing on deep learning and generative models.

3. Microsoft Certified: Azure AI Engineer Associate

- Focuses on implementing AI solutions on Azure, including building and deploying generative models.

4. AWS Certified Machine Learning – Specialty

- Validates skills in building, training, and deploying machine learning models, including generative models on AWS.

5. IBM AI Engineering Professional Certificate

- Covers concepts in machine learning and deep learning, including generative techniques using IBM Watson and TensorFlow.

6. NVIDIA Deep Learning Institute Certifications

- Provides specialized training in generative models and deep learning, including hands-on experience.

7. Generative Deep Learning: Teaching Machines to Paint, Write, Compose, and Play (Book/Certification)

- Focused on the principles of generative models, especially GANs and VAEs, with practical implementations.