**Generative AI Cheatsheet**

**Definition**

* **Generative AI**: Algorithms that generate new content based on learned data.

**Key Models**

* **Generative Adversarial Networks (GANs)**
  + *Description*: Consist of a generator that creates data and a discriminator that evaluates data.
  + *Use Case*: Generating realistic images.
* **Variational Autoencoders (VAEs)**
  + *Description*: Compress data into a latent space and then decode it to generate new data.
  + *Use Case*: Image synthesis and reconstruction.
* **Transformers**
  + *Description*: Models like GPT (Generative Pre-trained Transformer) that excel in understanding and generating text.
  + *Use Case*: Text generation, language translation.

**Applications**

* **Text Generation**
  + *Examples*: Writing articles, creating chatbots, generating code.
* **Image Generation**
  + *Examples*: Creating art, enhancing photos, generating realistic images from sketches.
* **Music and Audio**
  + *Examples*: Composing music, generating sound effects.
* **Other Applications**
  + *Examples*: Drug discovery, creating virtual environments, data augmentation.

**Benefits and Challenges**

* **Benefits**:
  + Enhances creativity.
  + Improves efficiency.
  + Opens new possibilities in various fields.
* **Challenges**:
  + Ethical concerns.
  + Quality control.
  + Dependency on large datasets.