**Framework for creating the model**

**Patient Information:**

* + Patient ID
  + Age
  + Event Death (possibly an indicator of patient survival status)
  + Survival (survival time)
  + Time to Recurrence
* **Treatment Information:**
  + Chemo (chemotherapy)
  + Hormonal (hormonal therapy)
  + Amputation
* **Tumor Characteristics:**
  + Histotype (histological type of tumor)
  + Diameter
  + Positive Nodes (number of positive lymph nodes)
  + Grade (tumor grade)
  + Angioinv (angiogenesis invasion)
  + Lymphinfil (lymphatic infiltration)
* **Genetic Information:**
  + Various gene identifiers (e.g., esr1, G3PDH\_570, Contig45645\_RC, etc.)

Angiogenesis is the process of new blood vessel formation. In the context of cancer, angiogenesis invasion refers to the ability of cancer cells to induce the growth of new blood vessels around the tumor. This is significant because tumors require a blood supply to grow and spread. Angiogenesis invasion is a factor that can contribute to the aggressiveness of a tumor and its potential to metastasize (spread to other parts of the body).

Lymphatic infiltration, also known as lymphovascular invasion, refers to the presence of cancer cells within the lymphatic vessels or channels that normally carry lymph fluid. The lymphatic system plays a key role in immune function and fluid balance in the body. If cancer cells invade the lymphatic system, they can potentially spread to nearby lymph nodes and beyond. Lymphatic infiltration is often considered a negative factor, indicating an increased risk of metastasis.

There are three main types of treatment: chemotherapy, hormonal therapy, and amputation. These options form the basic foundation for creating treatment plans. It's important to remember that not all patients require all three types of treatment. Our goal is to figure out the best combination of these treatments for each patient. This approach will improve how we provide effective and personalized care.

**Features:**

* Patient ID
* Age
* Histotype (histological type of tumor)
* Diameter
* Positive Nodes (number of positive lymph nodes)
* Grade (tumor grade)
* Angioinv (angiogenesis invasion)
* Lymphinfil (lymphatic infiltration)
* Genetic Information (various gene identifiers)

**Targets for Recommendations:**

* Chemo Recommendation (Binary: Yes/No)
* Hormonal Recommendation (Binary: Yes/No)
* Amputation Recommendation (Binary: Yes/No)

**Targets for Prediction:**

* Survival Time (Regression: Predicting the time)
* Event Death Prediction (Binary Classification: Predicting the risk of death)
* Time to recurrence

The system will have a dual purpose:

* **Treatment Recommendation:** Based on the patient's features, the system will recommend whether the patient should undergo chemotherapy, hormonal therapy, and/or amputation. This recommendation will aim to maximize the patient's survival time and minimize the risk of death.
* **Survival Time and Event Prediction:** Simultaneously, the system will predict the patient's survival time and the likelihood of an event (death) occurring. This will help guide the treatment recommendation.