TME Features

1. Class Distribution:

- This feature counts the occurrences of each tissue type. A tissue type is counted as one if 3 or 4 tiles of the same tissue are present in a 4x4 group of tiles.
- It provides a distribution of the different tissue types present.

For Example:

Class distribution for

1 (Adipose) = 3

2 (Immune) = 0

3 (Necrosis) = 0

4 (Normal) = 0

5 (Stroma) = 0

6 (Tumor) = 1

1	1	0	0	0
0	1	5	0	0
6	6	0	3	0
6	4	1	1	1
0	1	1	1	1

2. Adjacency Factor:

- Can be calculated for any two pairs of histology labels. For example:

$Stroma\_vs\_tumor$

$$= \frac{number\ of\ tumor\ tiles\ around\ every\ stroma\ tile}{number\ of\ tumor\ tiles\ around\ every\ stroma\ tile + total\ number\ of\ tumor\ tiles}$$

(Note: The neighborhood of a tile is the 8 tiles surrounding a tile)

0 = Glass/No tissue

1 = Adipose

2 = Immune

3 = Necrosis

4 = Normal

5 = Stroma

6 = Tumor

5	6	0	1	6
6	1	0	0	6
3	6	0	5	6
5	3	6	0	0
0	0	4	0	6

$$Stroma\_vs\_tumor = \frac{6}{6+8} = \frac{6}{14} = 0.43$$

3. Proximity Index:

- Can be calculated for any two pairs of histology labels.
- Measure how close the tiles of one histology label are to another histology label
  For example: For each immune cell, calculate the average distance to the nearest tumor cell.

4. Tissue type content:

- Measure how close areas with one tissue type are to another tissue type.
- For example: Measure the presence of adipose tissue within normal regions. For each normal tile, calculate the ratio of the number of adipose tiles to the total number of tiles in its vicinity.

$$Adipose\_in\_Normal = \frac{\text{number of adipose tiles}}{\text{otal number of tiles in its vicinity}}$$