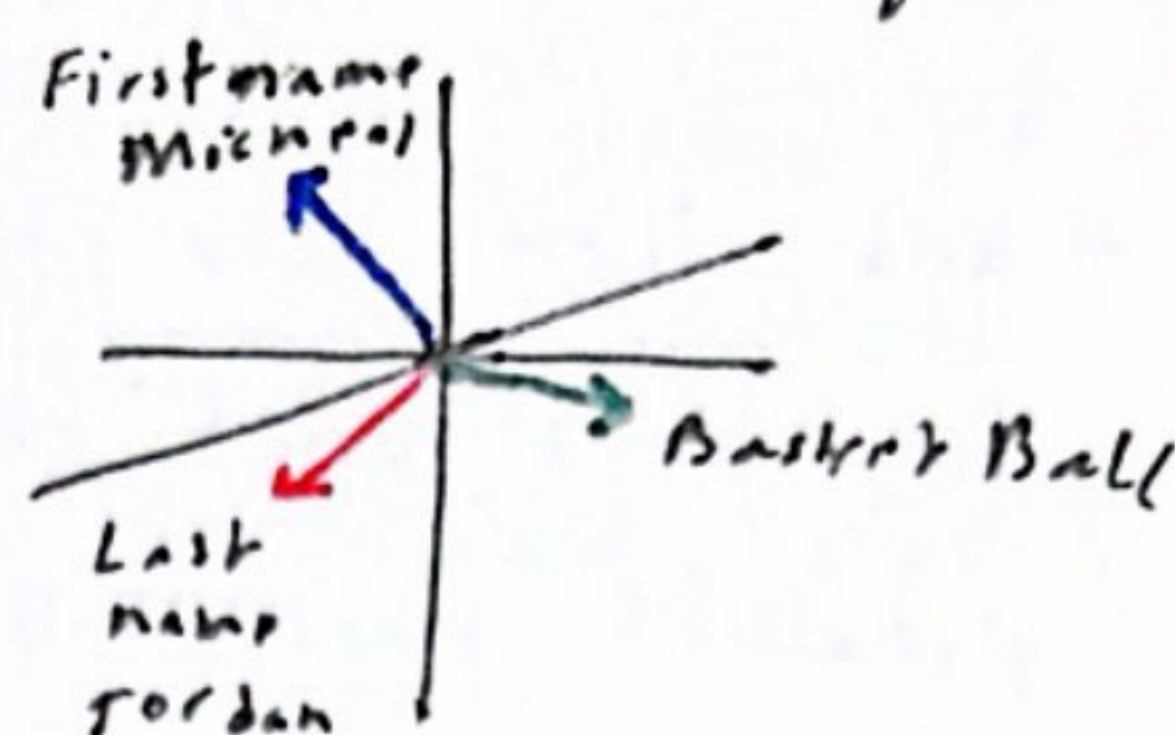


to talk about our Ex from last page we make a few assumptions about this high dim embedding space

- one direction in this high dim space represents first name Michel
- another nearly perpendicular space represents the last name Jordan



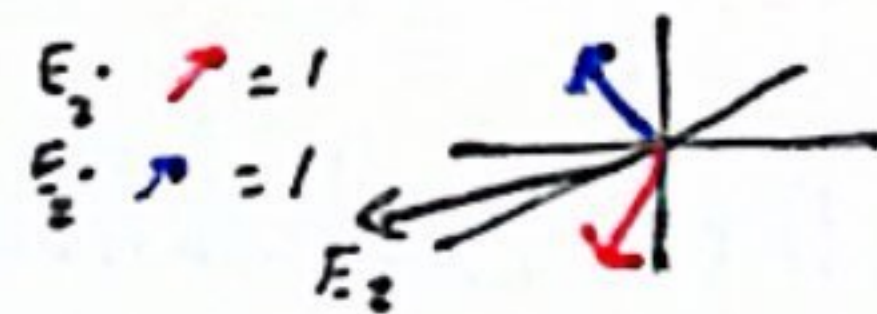
and one space will represent the idea of basketball

- This means if we pull out a vector being processed

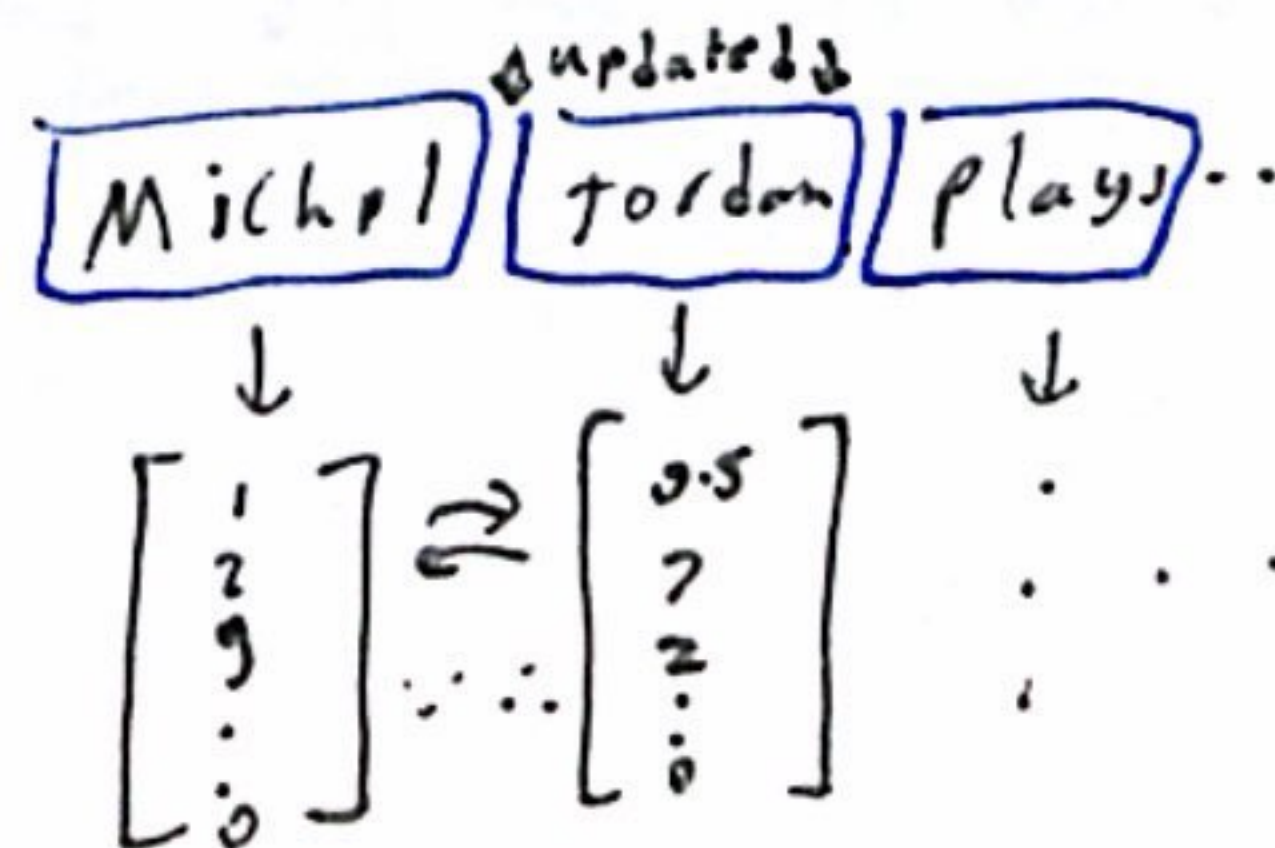
in the LLM if its dot product with first name Michel is 1 " $\vec{E} \cdot (\text{first name Michel}) = 1$ " that's what it would mean for that vector to be encoding the idea of a person with that first name and vice versa for a dot product of 0 for simplicity ignore dot products < 1 . $\vec{E} \cdot \vec{v} = 1$



- So now let's say a vector is meant to represent the full name Michael Jordan then the dot product with both Michael and Jordan directions would have to be 1.



- Since we assume 1 word = 1 token the text "Michael Jordan" spans 2 tokens we also assume a earlier attention block has passed info to the second of these two vectors "Jordan" to ensure it can encode 2 names hence the E_2 is just on a vector "Jordan"



- So after that attention the embedding of Jordan has changed to encode "Michael Jordan" from 63 the prev token's help