**Boundaries in the F-beta score**

Note that in the formula for Fβ*Fβ*​ score, if we set β=0,*β*=0, we get

F0=(1+02)⋅Precision⋅Recall0⋅Precision+Recall=Precision⋅RecallRecall=Precision.*F*0​=(1+02)⋅0⋅Precision+RecallPrecision⋅Recall​=RecallPrecision⋅Recall​=Precision. Therefore, the minimum value of β*β* is zero, and at this value, we get the precision.

Now, notice that if N is really large, then

Fβ=(1+N2)⋅Precision⋅RecallN2⋅Precision+Recall=Precision⋅RecallN21+N2Precision+11+N2Recall.*Fβ*​=(1+*N*2)⋅*N*2⋅Precision+RecallPrecision⋅Recall​=1+*N*2*N*2​Precision+1+*N*21​RecallPrecision⋅Recall​.

As N*N* goes to infinity, we can see that 11+N21+*N*21​ goes to zero, and N21+N21+*N*2*N*2​ goes to 1.

Therefore, if we take the limit, we have

limN→∞FN=Precision⋅Recall1⋅Precision+0⋅Recall=Recall.lim*N*→∞​*FN*​=1⋅Precision+0⋅RecallPrecision⋅Recall​=Recall.

Thus, to conclude, the boundaries of beta are between 0 and ∞.∞.

* If β=0,*β*=0, then we get **precision**.
* If β=∞,*β*=∞, then we get **recall**.
* For other values of β,*β*, if they are close to 0, we get something close to precision, if they are large numbers, then we get something close to recall, and if β=1,*β*=1, then we get the **harmonic mean** of precision and recall.