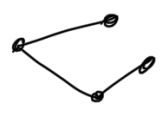


CW complexes - formal definition

Last time

(1)



(2)



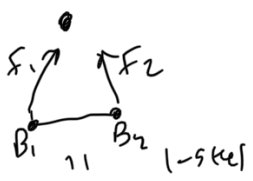
(Finite)

Def A CW-complex is a space constructed as follows

0-skel

(1) Start w/ finite set  $X^0$  w/ discrete top points are 0-cells,  $X^0$  is "0-skeleton"

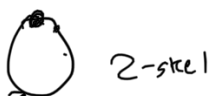
(2) Given  $(n-1)$ -skeleton  $X^{n-1}$ , form  $X^n$  by taking disjoint of closed  $n$ -balls  $B_1, \dots, B_k$ , then glue the bdy of each to  $X^{n-1}$  via  $f_i: \partial B_i \rightarrow X^{n-1}$  cts map



$$X^n = (X^{n-1} \cup B_1 \cup \dots \cup B_k) / \sim$$

↑  
disjoint union

$\sim$  given by  $x \sim f_i(x) \quad \forall x \in \partial B_i$  same?



(3) A CW-complex is some such  $X^n$  the dimension of the cpx is the dimension of the highest dim cell in it

Examples (1) 0-skel:

1-skel: • (no 1-cells)

2-skel:  $F_i: B_i \rightarrow P$   
 $F_i(x) = p$   
 $\forall x \in \partial B_i$

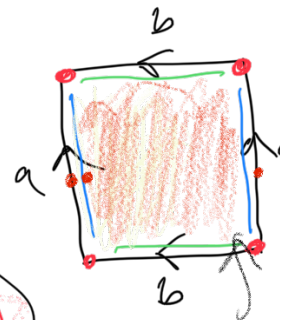
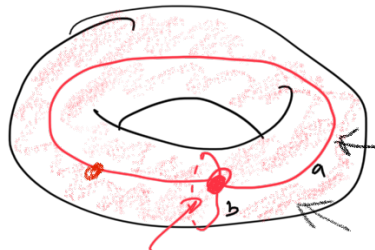


(2)

0-skel: •

1-skel:

2-skel:



Non-examples

(1)



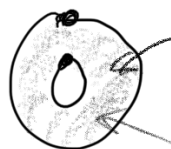
Can't glue pts in interiors of the cells

(2)



need some 0-skel to glue into

(3)



not interior of some  $B_i$