

Sesión 10.0 – CS3102 EDA

Prof. Victor Flores

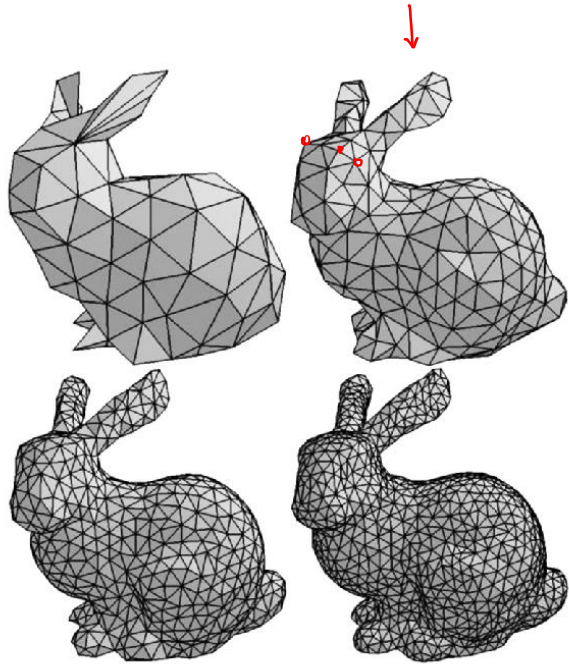
31 de Mayo de 2022



Contenido

- Representación de objetos espaciales
- Interior-Based Representations
- Celdas y mosaico
- Space-filling curves

Representación de objetos espaciales



Representación de objetos espaciales

Object-based decomposition

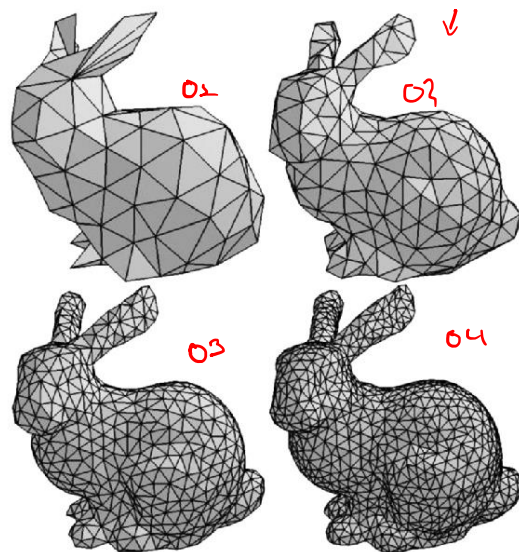


Image-based (cell-based) decomposition



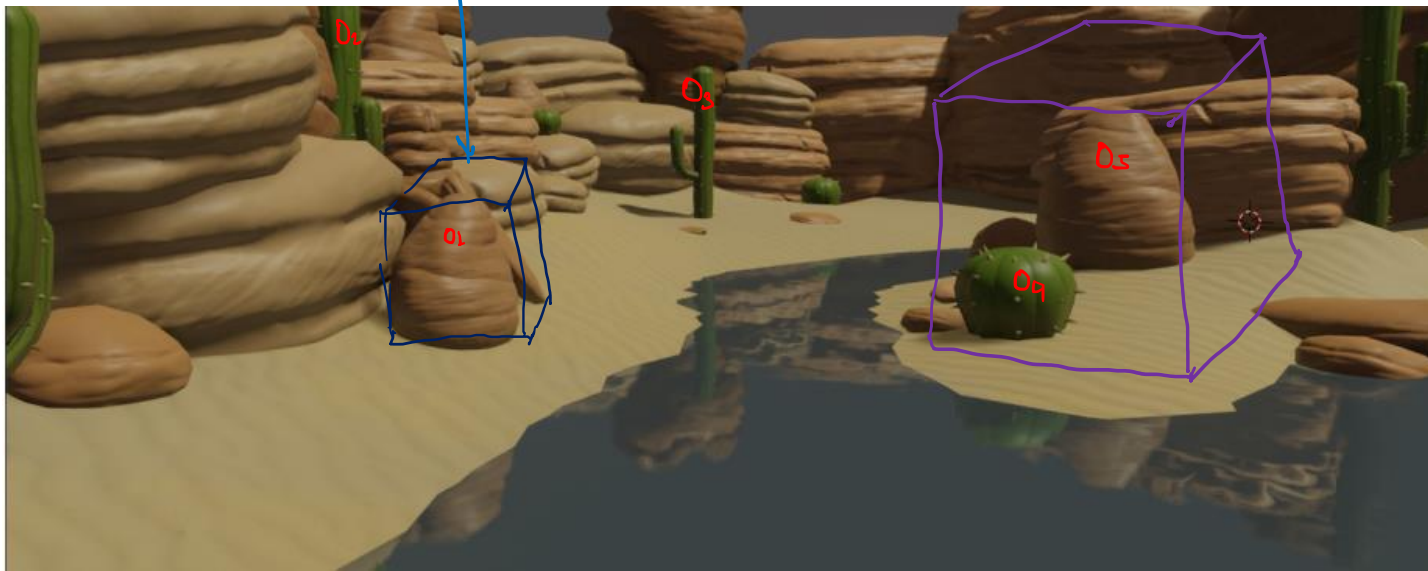
Representación de objetos espaciales

Feature query

(feature-based, object-based)

¿donde está?

textura
Velocidad



Location query

(location-based, image-based, cell-based)

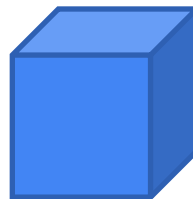
¿que hay?

Representación de objetos espaciales

Pixel



Voxel



Representación de objetos espaciales

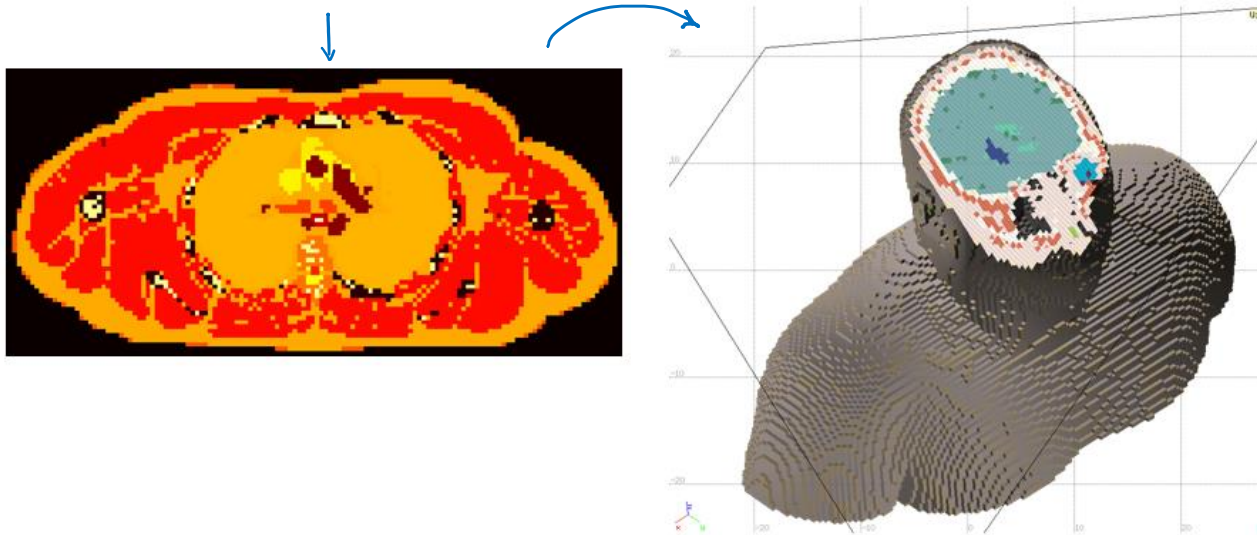
Pixel



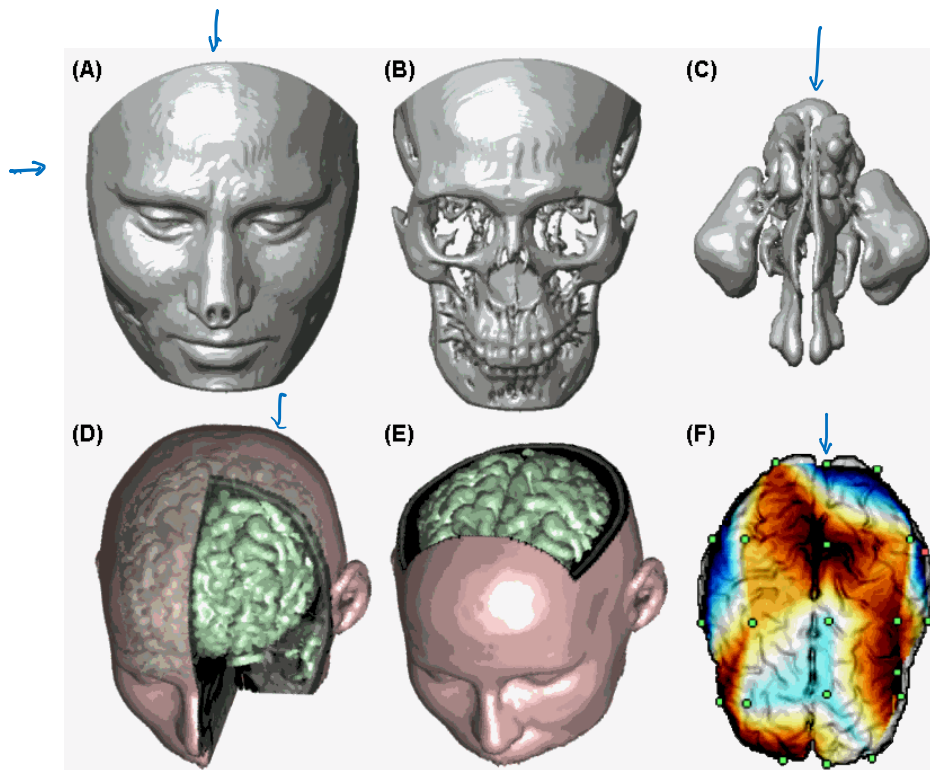
Voxel



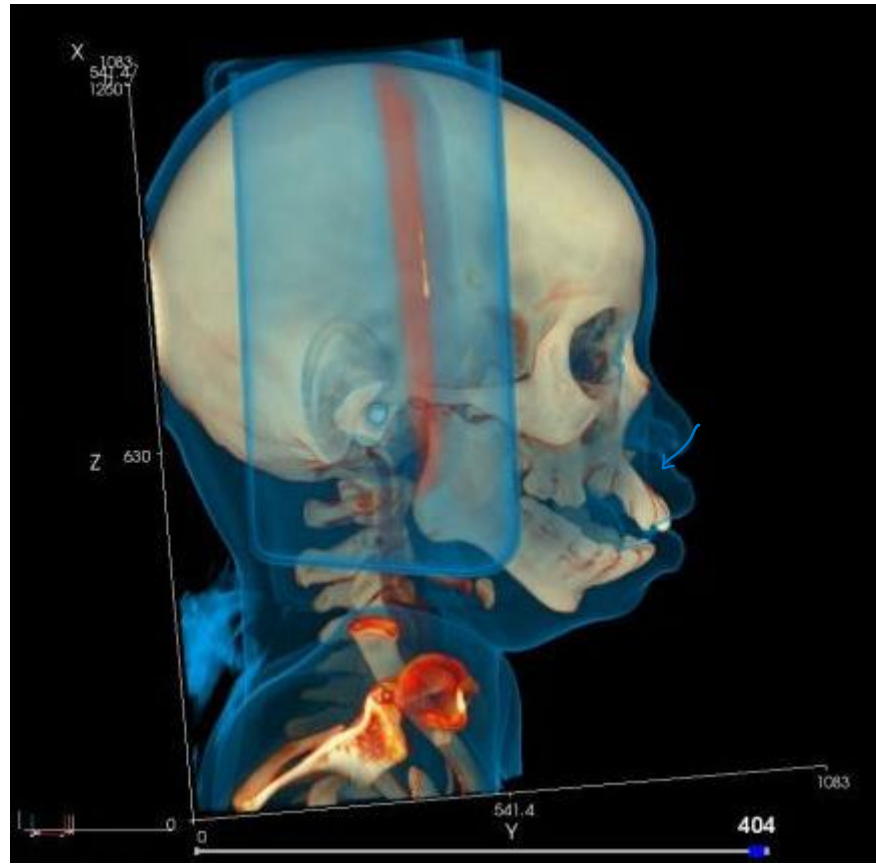
Representación de objetos espaciales



Representación de objetos espaciales

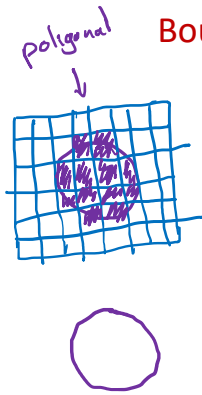
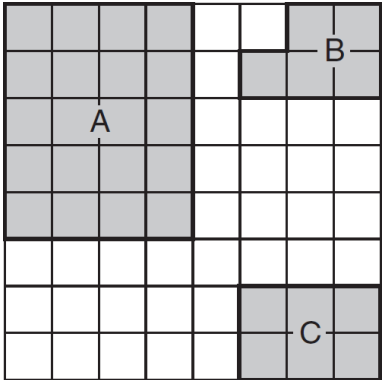


Representación de objetos espaciales

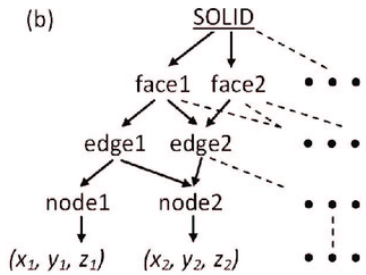
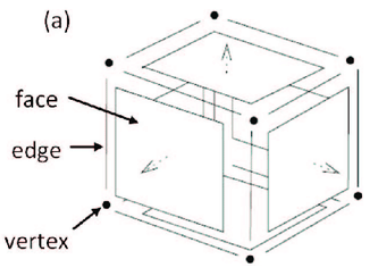


Representación de objetos espaciales

Interior-based representations

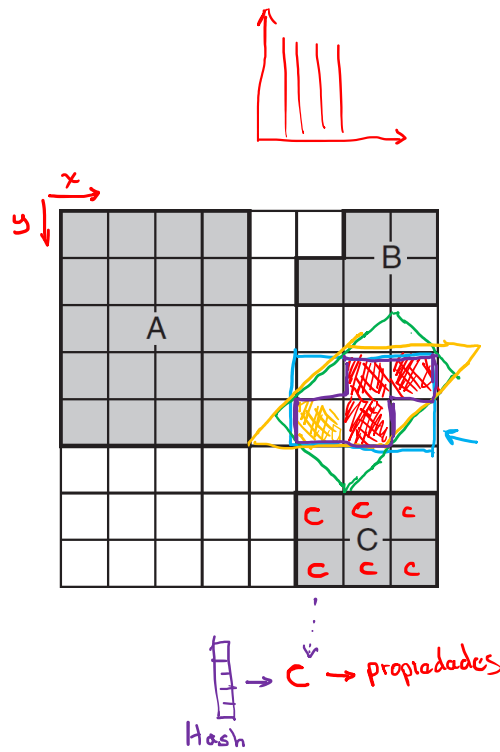


Boundary-based representations



Interior-Based Representations

Celda unitaria



$Query(B) \rightarrow Hash$
 $Query(\square)$

Representación explícita

(object-based) $B: \{(5,1), (6,0), (6,1), (7,0), (7,1)\}$
 \uparrow
 $AABB \rightarrow MAB$

Representación implícita

(image-based)

Celda y mosaicos

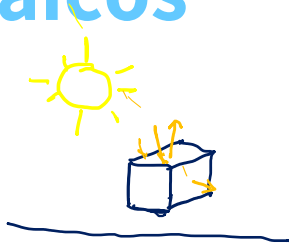
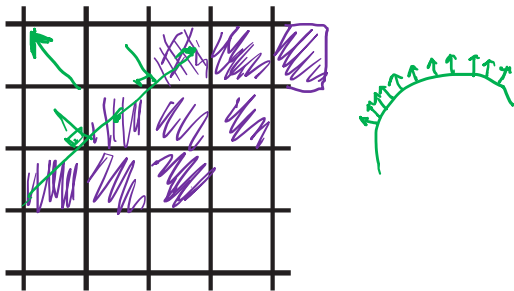
(cell and tilings)

1. La partición debe ser un patrón infinitamente repetitivo, de modo que pueda utilizarse para imágenes de cualquier tamaño.
2. La partición debe ser infinitamente descomponible en patrones cada vez más finos (es decir, de mayor resolución). Esto significa que el tamaño de las celdas de tamaño unitario no tiene un mínimo.

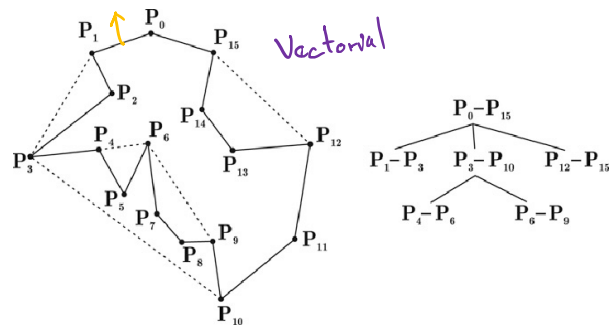
Celda y mosaicos

(cell and tilings)

Poligonal



No poligonal

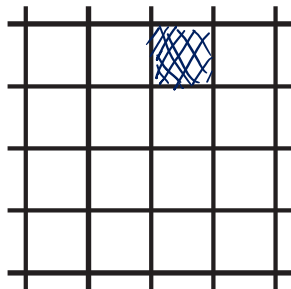


- Mas flexibles
- Aprox. límites
- Normales son fáciles de calcular

Baldosa y mosaicos

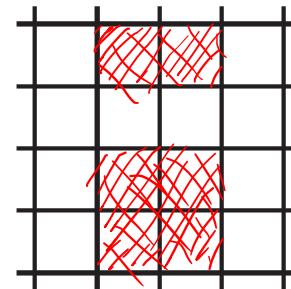
(tile and tilings)

Atomic tile



Regular tiling

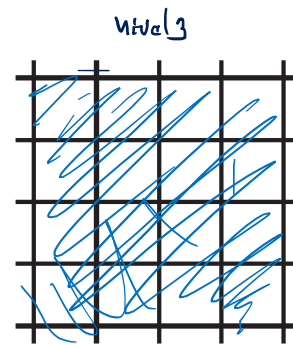
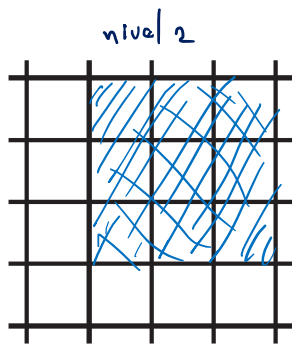
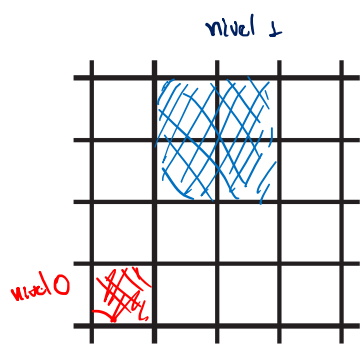
Molecular tile



Baldosa y mosaicos

(tile and tilings)

Molecular tile

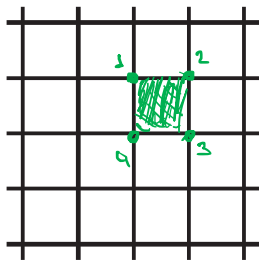


Similar tiling tile at level $k \approx$ tile at level 0

Celda y mosaicos

(cell and tilings)

Notación

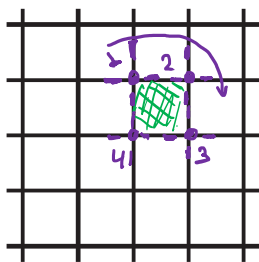


$$4 \times 4 \times 4 \times 4 \rightarrow [4^4]$$

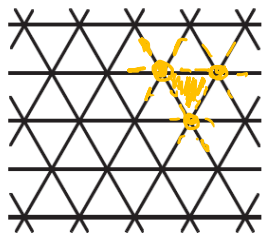
Celda y mosaicos

(cell and tilings)

Notación



$$[4^4]$$
$$4 \cdot 4 \cdot 4 \cdot 4 = 4^4$$

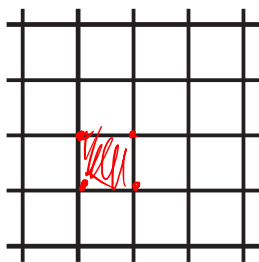


$$6 \cdot 6 \cdot 6$$
$$[6^3]$$

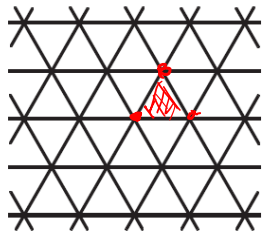
Celda y mosaicos

(cell and tilings)

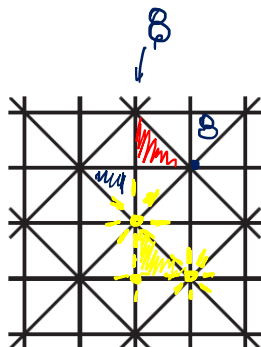
Notación



$[4^1]$



$[6^3]$

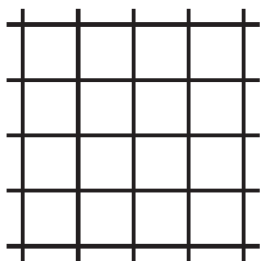


$$8 \cdot 8 \cdot 4 = 4 \cdot 8^2$$

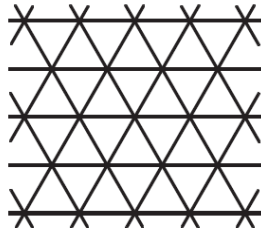
Celda y mosaicos

(cell and tilings)

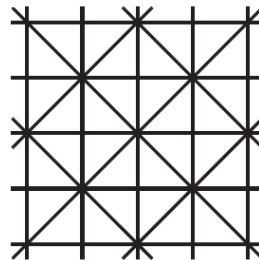
Notación



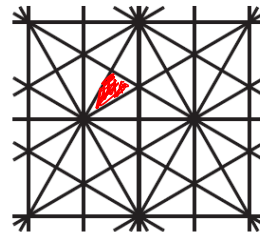
$[4^4]$



$[6^2]$



$[4 \cdot 8^2]$

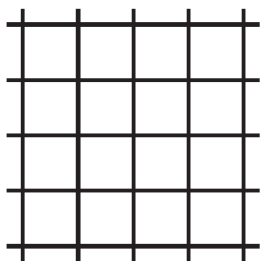


$[4 \cdot 6 \cdot 12]$

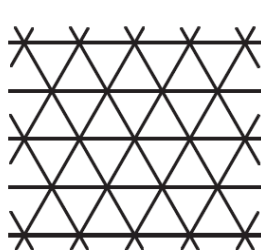
Celda y mosaicos

(cell and tilings)

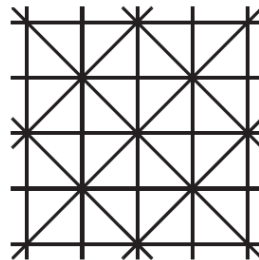
Notación



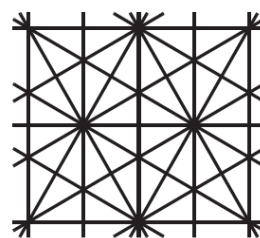
$[4^4]$



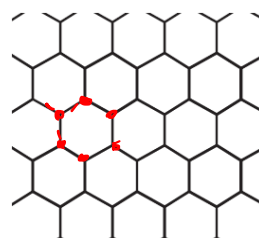
$[6^3]$



$[4.8^2]$



$[4.6.12]$

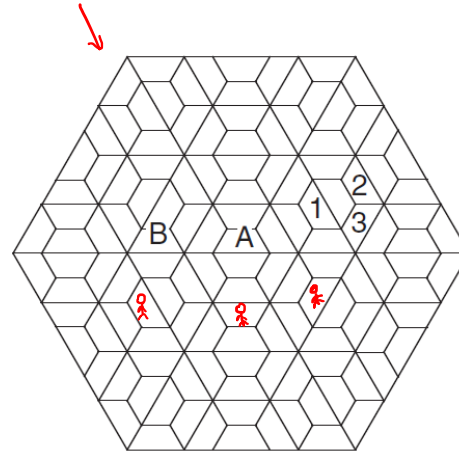
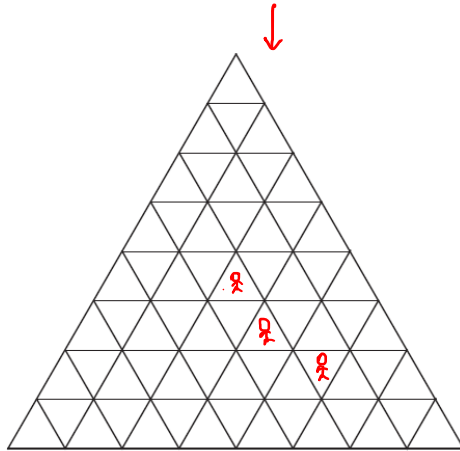


$[3^6]$

Celda y mosaicos

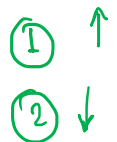
(cell and tilings)

Mosaicos isoédricos



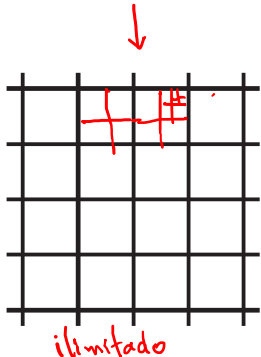
Celda y mosaicos

(cell and tilings)

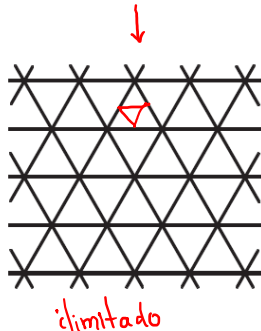


Mosaicos limitados

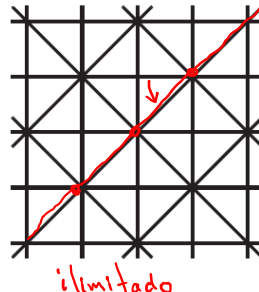
La celda atómica no se puede descomponer



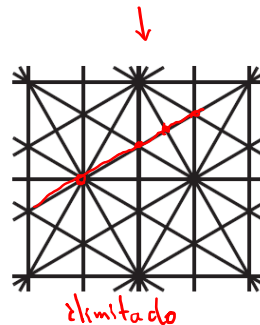
ilimitado



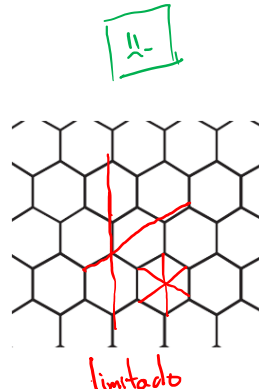
ilimitado



ilimitado



ilimitado



limitado

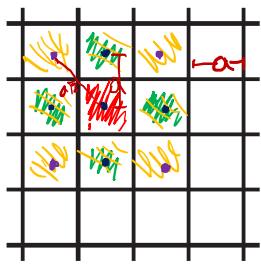
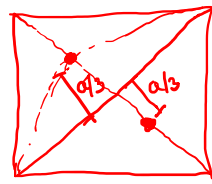
Celda y mosaicos

(cell and tilings)

tile vecino \rightarrow  

Adyacencia uniforme

todos los distancias a los centroides son iguales

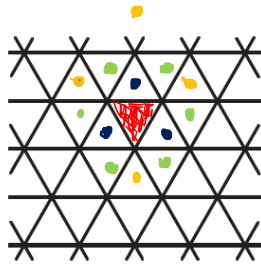


4-vecinos

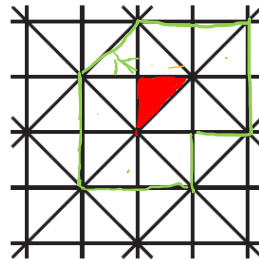
8-vecinos

$\{a, a\sqrt{2}\}$

adyacencia: 2

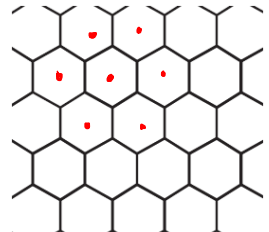
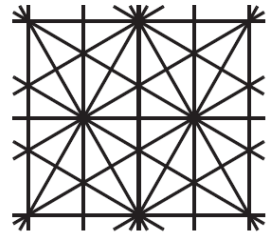


adyacencia: 3



|||||

adyacencia: 7



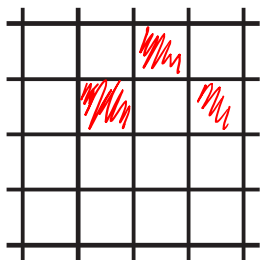
Uniforme

Celda y mosaicos

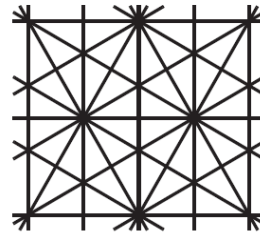
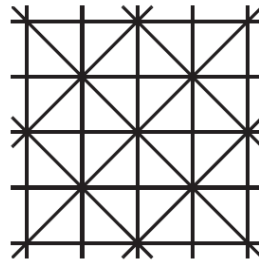
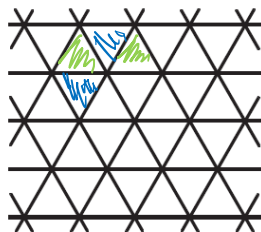
(cell and tilings)

Orientacion uniforme

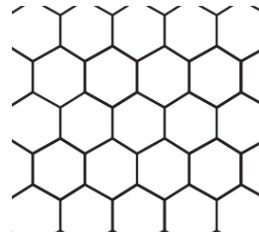
Uniforme



no uniforme



Uniforme



Celda y mosaicos

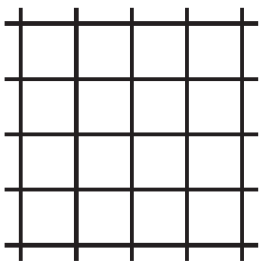
(cell and tilings)

Es preferible mosaicos con orientación uniforme y una distancia de
adyacencia mínima

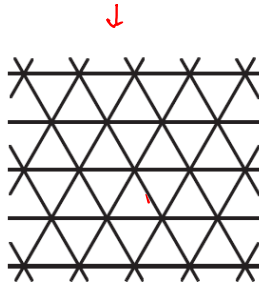
Celda y mosaicos

(cell and tilings)

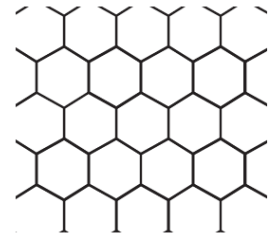
ad. 2
Uniforme
↓



ad. 3
no uniforme
↓

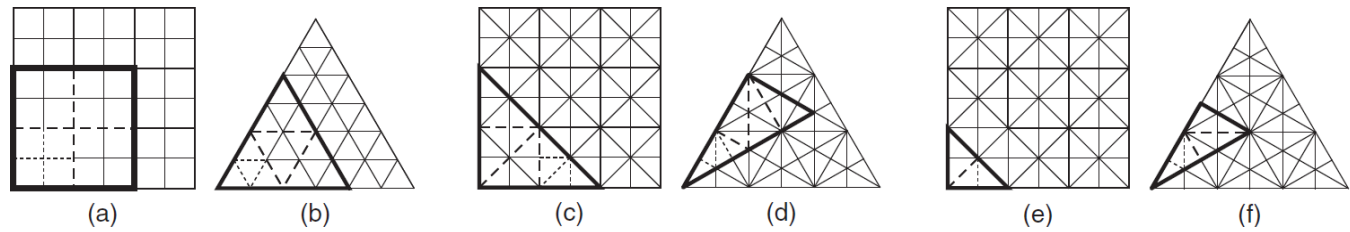


ad. uniforme
orientación uniforme
Prop 2 x



Celda y mosaicos

(cell and tilings)



¿Preguntas?

