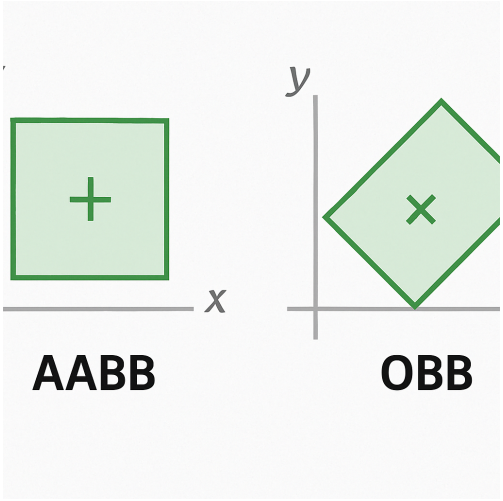
Bounding Volumes



Yes, this is indeed a classic **Axis-Aligned Bounding Box (AABB)** intersection question, which is **very relevant** for technical artists — especially in areas like:

- **Collision detection**
- **Shader bounding box calculations**
- **AR/VR hit tests**
- **Culling logic**
- **Level-of-detail systems**
- **Raycasting optimizations**

□□ Problem Breakdown

You're given two AABBs defined as:

```
box = [left, bottom, right, top]
```

And you’re told:

- The boxes do **not** intersect if they only **touch at the edges**.
- They **must have area of overlap** (i.e., true intersection, not adjacency).

Intersection Logic

Two AABBs intersect **if and only if**:

```
not (
    box1.right <= box2.left or
    box1.left >= box2.right or
    box1.top <= box2.bottom or
    box1.bottom >= box2.top
)
```

Why Tech Artists Should Know This

Tech artists frequently deal with:

- Bounding boxes for **visual effects triggering**
- Geometry occlusion
- Placement tools
- Region-based optimizations
- Unity/Unreal custom tools

Even shaders can use similar logic for intersection checks in screen space or world space.

Would you like a Python example for this, or maybe a visual explanation or diagram?

Great question — this is a **key detail** in many AABB problems, especially for tech artists dealing with precision and hitboxes.

What It Means:

When the problem says:

> "The boxes do **not** intersect if they only **touch at the edges**"

...it means **boxes must share actual area** (non-zero width and height of overlap) to count as "intersecting."

✅ Intersecting

Two boxes **intersect** if they overlap **inside** — like this:

```
+---------+
|         |
|  A      |
|    +---------+
|    |    B    |
+----+---------+
```

Here, `A` and `B` overlap **partially**, so it's an intersection.

❌ Not Intersecting — Edge Touch

Boxes that **just touch** on the side like this:

```
+-----+
| A   |
+-----+
      +-----+
      |  B  |
      +-----+
```

Here, box A's **right side equals** box B's **left side** — they **touch**, but **do not overlap**, so this is **not** an intersection.

Same applies if they touch **top to bottom**, or at **corners**.

🧠 Tech Artist Analogy

Think of this like placing two tiles next to each other on a grid. If they're only **flush**, there's no actual shared area — they're adjacent, not overlapping.

This matters a lot in:

- Physics engines (collision vs proximity)
- Raycasting hitboxes
- Shader region effects

- Bounding-box culling

Want me to draw an ASCII or image diagram to show edge vs overlap visually?

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