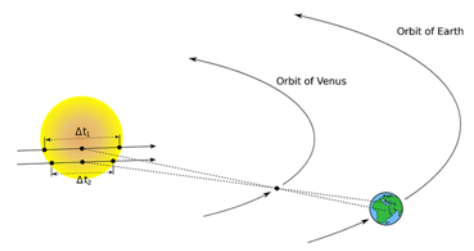# The Rotation Equation

Background Story: You're the new assistant to **Captain Zulu**, a globe-trotting adventurer who zips around the planet helping scientists, rescuing pandas, and eating a lot of noodles. But there's a problem: Captain Zulu always forgets what time it is where he's going! You'll need to use your knowledge of **Earth's rotation and time zones** to save the day (and make sure he doesn't miss dinner in Tokyo again).

TIME ZONE (compared to UTC)

- Los Angeles: UTC -8   - Cairo: UTC +2   - Tokyo: UTC +9
- New York: UTC -5   - New Delhi: UTC +5.5   - Sydney: UTC +10
- London: UTC +0

Instructions: Use the time zone offsets and your understanding of Earth's rotation (rotates 15° per hour = 1 hour per time zone) to answer the following travel time questions.

Travel Missions:

1. Captain Zulu leaves London at 3:00 PM (UTC +0) and flies to New York (UTC -5).
What local time will it be in New York when he lands?

2. He then hops on a flight from New York at 8:00 PM (local time) to Los Angeles (UTC -8).
What time is it in Los Angeles when he lands?

3. Captain Zulu video calls his scientist friend in New Delhi at 9:00 AM London time.
What time is it in New Delhi (UTC +5.5)?

4. If it's 11:00 PM in Tokyo, **what time is it in Sydney?**

5. Captain Zulu wants to watch the solar eclipse live, streaming from Cairo at 4:00 PM local time. **What time should he tune in from London?**

6. He finally arrives home in London at midnight and sends a thank-you text to a friend in Los Angeles. **What time is it in Los Angeles?**

7. Why do places on Earth experience different times of day even though the Sun shines on everyone?