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Modeling Project Part 2
Basic Extraterrestrial Solar Irradiance Calculator

Inputs:

- Location latitude: 32
- Location longitude: -30
- PV array tilt: 15
- Day of year: 112
- Civil time of day, in hours: 16
- Time zone in reference to UTC: -2
- Clearness index: 0.55
- Albedo: 0.25

Outputs:

- Extraterrestrial irradiance on plane normal to sun, G_{0n}: 1351.23 W/m^2
- Declination angle, δ (degrees): 11.93 degrees
- Hour angle, ω (degrees): 75 degrees
- Zenith angle, θ_z (degrees): 71.08 degrees
- Angle of incidence, θ (degrees): 73.29 degrees
- Cosine of the angle of incidence: 0.30
- Irradiance on the PV array ignoring the effects of the atmosphere, G_{0T}: 408.87 W/m^2
- Global Horizontal Irradiance, G_{GHI} : 241.00 W/m^2
- Beam component of GHI, G_b: 149.78 W/m^2
- Diffuse component of GHI, G_d: 91.22 W/m^2
- Coefficient R_b: 0.93
- Beam irradiance on tilted surface, G_{bT}: 139.76 W/m^2
- Diffuse irradiance on tilted surface, G_{dT}: 89.66 W/m^2
- Ground reflected irradiance on the tilted surface, $G_{gnd,T}$: 1.03 W/m^2
- Total irradiance on the tilted surface, G_T: 230.45 W/m^2