System Performance Calculations formulas

1- Annual AC output (kWh) = kWp x Kk x SF

Where as:
- **kWp** refers to the kWp output of the system
- **Kk** is a tabulated value of kWh/kWp for different postcode zones
- **SF** relates to a shade factor that needs to be determined

kWh/kWp value (Kk)
the following map and table give information on the postcode zone relating to the location of the PV system. Each zone has a table from which the **Kk** value can be obtained.

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Note: this is the UK Postcode Components (Format)
Post codes can also be broken down into meaningful constituent components.
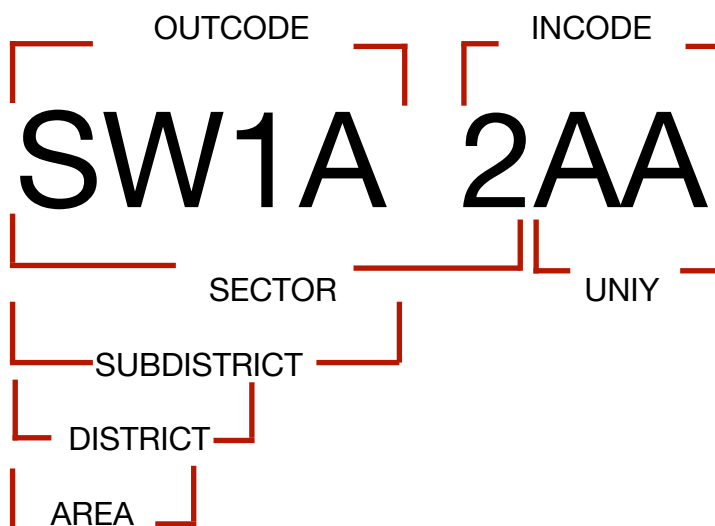
Therefore, we only looking for **AREA** up to **SUBDISTRICT** which is OUTCODE and when customer give us for postcode such as **SW1A 2AA** system should have eliminated rest of the postcode (**space** and **INCODE**). You can find all post code and zones in PostcodeZone fileS (EXCEL and CSV attached.

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Each zone has a table from which the **Kk** value can be obtained. I will attach those table called Irradiance-Datasets.xlsx. This value will alter depending upon the **orientation** and **inclination** of the PV array.

SF in the equation is an estimation of the shading that could affect the PV system. the SF takes into account objects which are further that 10m away from the centre of the array and objects which are at or less than 10m away from the centre midpoint of the array.
1-(0.01 x 11) = 1 - 0.11 = 0.89

Example if we have a Postcode: BN3 3TU
orientation: -6
Inclination: 33
Shade factor: %40
kWp: 3.5

The Annual AC Output (kWh/Year) = kWp x Kk x SF

the post code Zone is: 2
from Irradiance Irradiance-Datasets Zone 2 -Brighton coordinate for row 5 and column 33 is:1126. Therefore kWp= 1126 (note that -6 or 6 is ver close to 5 and not to 10 therefore we have to pick 5 from the grid on Zone 2) use round up ad round down

(kWh/Year) = 3.5 x 1126 x (1-(0.01 x40) = 1 - 0.40 = 0.60)
(kWh/Year) = 3.5 x 1126 x 0.60
(kWh/Year) = 2352