

Calculating the angle between two points in the 2D space.

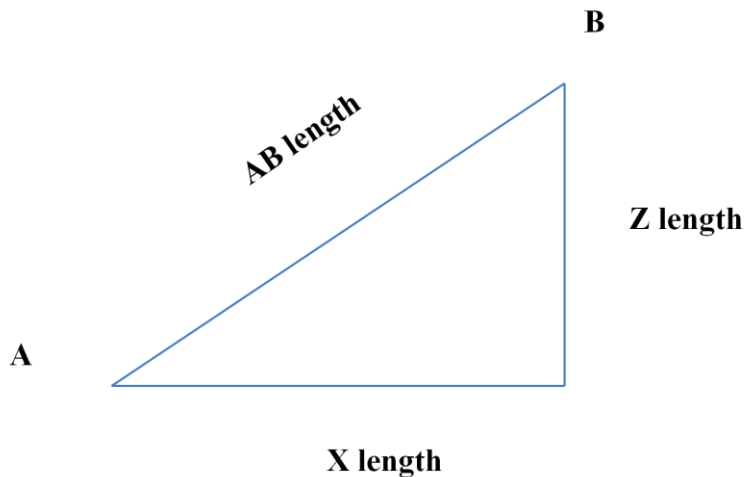
Here a short tutorial on how to calculate the angle between two points in the 2D space.
Here the XZ plane.

First some simple mathematics.

As you (may) know, the sinus between two lines is Z length / AB length.

Pythagoras tells us that $AB \text{ length} = \sqrt{X \text{ length} * X \text{ length} + Z \text{ length} * Z \text{ length}}$

Knowing the sinus, we also know the angle = $\text{asin}(Z \text{ length} / AB \text{ length})$ in radians!



Note: As you can see the angle between a and b is different from the angle between b and a.
Think about this when calculating the angle.

Knowing this, the python code is not that difficult.
Below the code is shown in a Xpresso Python set up.

```
import sys; import math; def main(): global Output; xlen = b-a.x; zlen = b-a.z; ablen = math.sqrt(xlen*xlen+zlen*zlen); sin = zlen / ablen; print "sinus: ", sin; angle_in_rad = math.asin(sin); print "Angle in rad: ", angle_in_rad; angle_in_degrees = default.degangle_in_rad; print "Angle in degrees: ", angle_in_degrees; Output1 = angle_in_degrees
```

```
import c4d
import math

def main():
    global Output1

    xlen = b.x-a.x
    zlen = b.z-a.z
    ablen = math.sqrt(xlen*xlen+zlen*zlen)

    sin = zlen / ablen
    print "sinus: ", sin

    angle_in_rad = math.asin(sin)
    print "Angle in rad: ", angle_in_rad
    angle_in_degrees = c4d.utils.Deg(angle_in_rad)
    print "Angle in degrees: ", angle_in_degrees

    Output1 = angle_in_degrees
```