**Use Case: compare the APAP concentration in three zones**

**Here is my logic to calculate the solute concentrations in 3 zones.**

There are two types of SS.

**Circumference:** Type A is 30, Type B is 5.

**Avergage Length:** TypeA is 8, Type B is 33.33.

**Percentage:** Type A is 0.9, type B is 0.1.

**HEP\_dencity** = 0.9

**Num\_Zone\_0\_SS** = 45

**Num\_Zone\_1\_SS** = 20

**Num\_Zone\_2\_SS** = 3

Assume the output profile of APAP at a certain cycle is x

**SS\_type\_A calculation**

At a certain time, the number of APAP through in one SS\_type\_A is calculated as x\*((30^2)/(4\*3.14))\*8 = 573x

The number of HPC in SS\_type\_A can be calculated as 30\*8\*0.9 = 216

The concentration of APAP/HPC in SS\_type\_A is: (573x)/216=2.65x

**SS\_type\_B calculation**

the number of APAP through the SS\_type\_B is calculated as x\*((5^2)/(4\*3.14))\*33.33 = 66.34x

The number of HPC in SS\_type\_B can be calculated as 5\*33.33\*0.9 = 150

The concentration of APAP/HPC in SS\_type\_A is: (66.34x)/150=0.44x

Number of SS\_type\_A in zone 0: **45\*0.9 = 40.5**

Number of SS\_type\_B in zone 0: **45\*0.1 = 4.5**

Number of SS\_type\_A in zone 1: **20\*0.9 = 18**

Number of SS\_type\_B in zone 1: **20\*0.1 = 2**

Number of SS\_type\_A in zone 2: **3\*0.9 = 2.7**

Number of SS\_type\_B in zone 2: **3\*0.1 = 0.3**

APAP concentration in zone 0 in one cycle: **2.65\*40.5 + 0.44\*4.5 = 109.31x**

APAP concentration in zone 1 in one cycle: **2.65\*18 + 0.44\*2 = 48.58x**

APAP concentration in zone 2 in one cycle: **2.65\*2.7 + 0.44\*0.3 = 7.29x**