This problem will be solved with the same sequence physicists should be seated next to each other.

If n = 3, these are some valid seatings: MMP, MPM. But PPM is not a valid seating.

What are the number of valid seatings given n?

Find a recurrence relation f(n) to give the number of valid seatings for any n.

Show your work

Solution

This problem will be solved with the same sequance of fibonacci numbers for n>2.

Proof:

@ n = 0: f(n) = 0

@ n = 1: f(n) = 2 which are (p,m)

@ n = 2: f(n) = 3 which are (mp , pm, mm)

@ n = 3: f(n) = 5 which are (mmp, pmm, mpm, pmp, mmm) = f(2) + f(1)

@ n = 4: f(n) = 8 which are (pmmm, mpmp, pmpm, pmmp, mpmm, mmpm, mmmp, mmmm) = f(3) +f(2)

@ n = 5: f(n) = 13 which are (the same pattern is done)

so according to Fibonacci equation, the solution of this problem is

fib(n) = fib(n-2) + fib(n-1) for n>2