ICCS200: Assignment 3
Vikrom Narula
vikrom.nar@gmail.com
17/05/2019
People in 1408

Exercise 1:
Don't fully know how to do

Exercise 2:
Don't fully know how to do

Exercise 3:
Base Case: P(1) is just 4 by 4 with one missing spot and we can fit one L and we can rotate to get 4 outcome.

We assume the size is $2^i \; by \; 2^i$ and its tileable
If we break the size to a quad section while add L to the middle of the board by positioning it so that the missing piece is at the painted section we will have 4 section each with missing pieces.
If we pursue to keep doing this till we have 4 by 4 we know the tile are tileable hence the whole board is tileable.

Exercise 5:

Task 1:

$P(i) =: T(i) == 2^i - 1$

$B.C. =: T(1) == 2 - 1 = 1$

Inductive Step- $WTS: T(n+1) = 2^{n+1} - 1$

So $\quad 2T(n) + 1 \Rightarrow 2(2^n - 1) + 1 \Rightarrow 2^{n+1} - 2 + 1 == 2^{n+1} + 1$

Hences Proved

Task 2:

$Predicate: P(i) =: g(i) == 2F(i) - i$

$Base\ Case: g(0) = 2F(0) - 0 = 0$

$Inductive\ Step: IH;\ assume\ g(k) == 2F(k) - k\ for\ all\ k \geq 0$

$WTS: g(k+1) = 2(F(k+1) - k + 1)\ \{g(n) = 2g(n-1) + n$

$$g(k+1) = 2(F(k) - k) + n - 1$$

$$g(k+1) = 4F(k) - k - 1$$

$$= 2(F(k+1)) - (k-1)$$

$$LHS == RHS$$

Hence Proved