HW5 Jin Kweon (3032235207)

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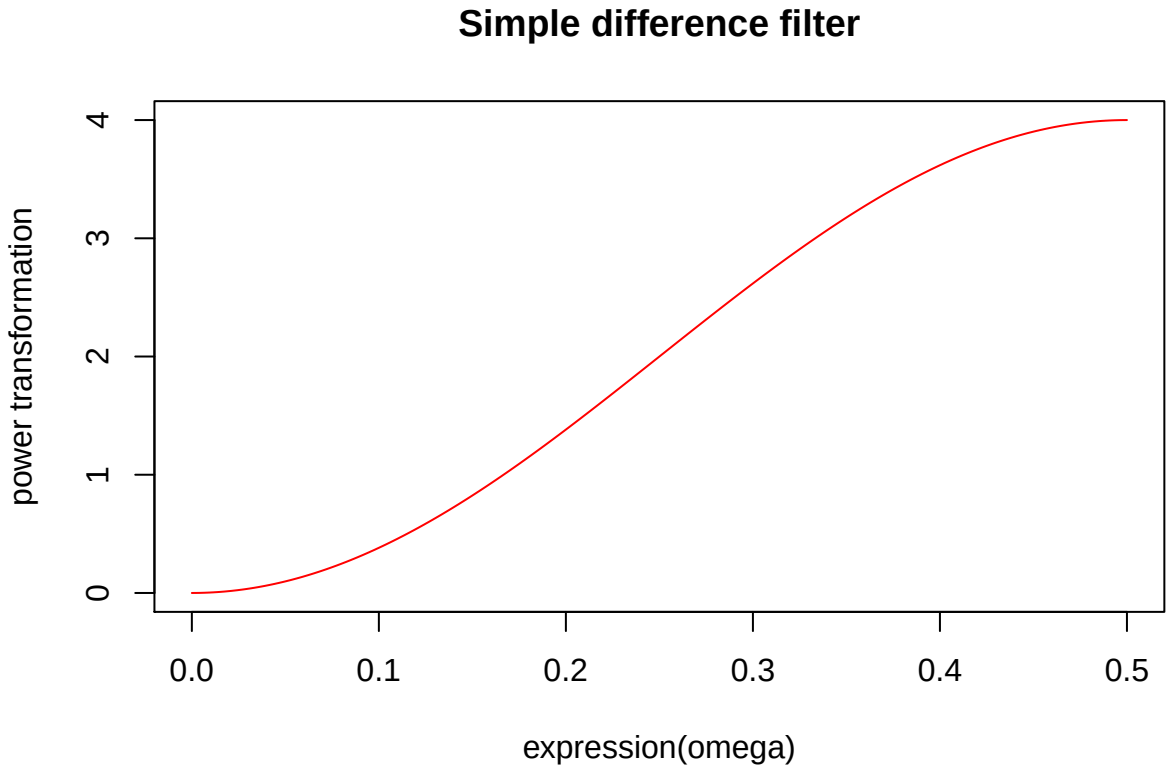
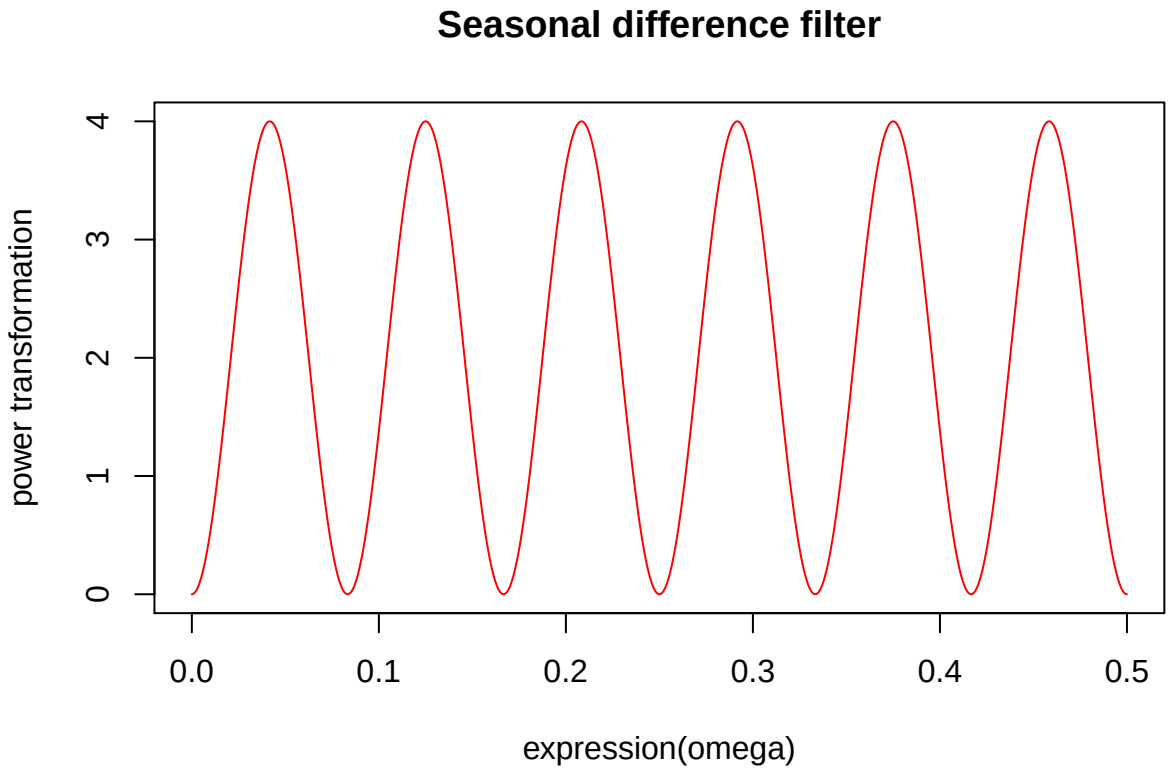
3/7/2018

1 - b) and c)

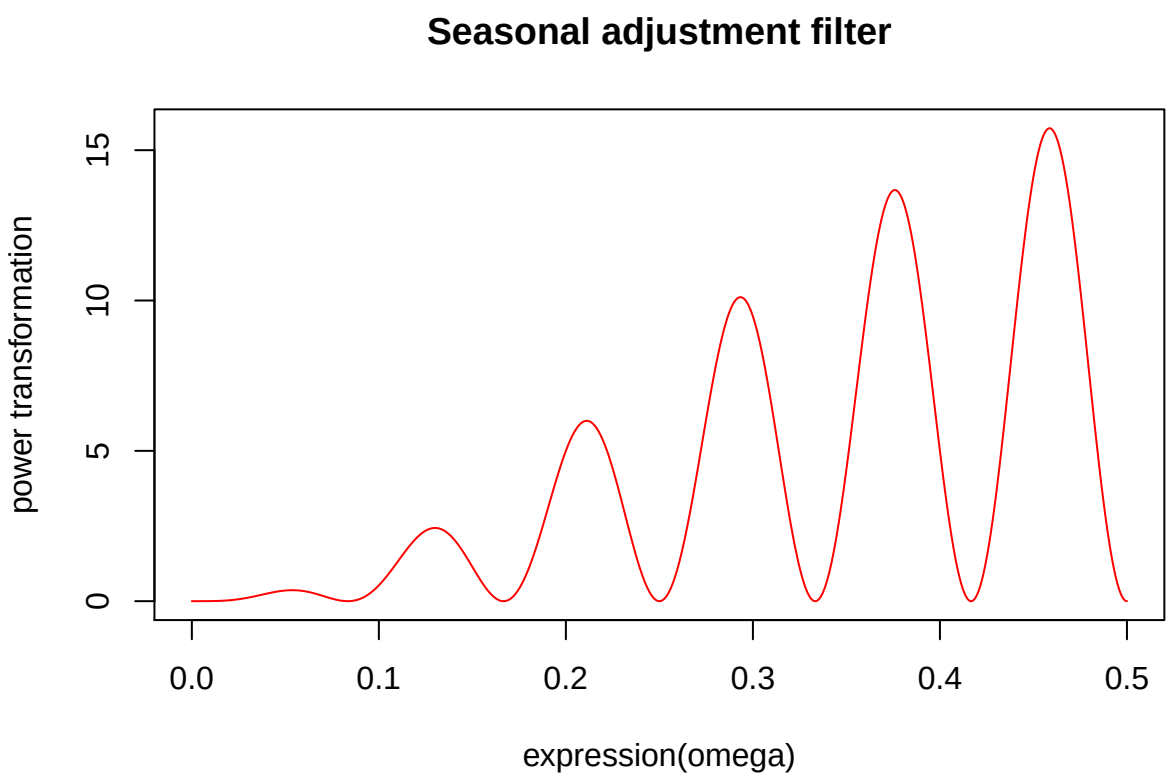
```
simple <- function(x){2 - 2 * cos(2 * pi * x)}
curve(simple, 0, 1/2, n = 2000, col = "red", xlab = "expression(omega)", ylab = "power transformation",
      main = "Simple difference filter")
```




```
seasonal <- function(x){2 - 2 * cos(24 * pi * x)}
curve(seasonal, 0, 1/2, n = 2000, col = "red", xlab = "expression(omega)", ylab = "power transformation
      main = "Seasonal difference filter")
```




```
adjustment <- function(x){4 * (1 - cos(2 * pi * x)) * (1 - cos(24 * pi * x))}
curve(adjustment, 0, 1/2, n = 2000, col = "red", xlab = "expression(omega)", ylab = "power transformati
      main = "Seasonal adjustment filter")
```

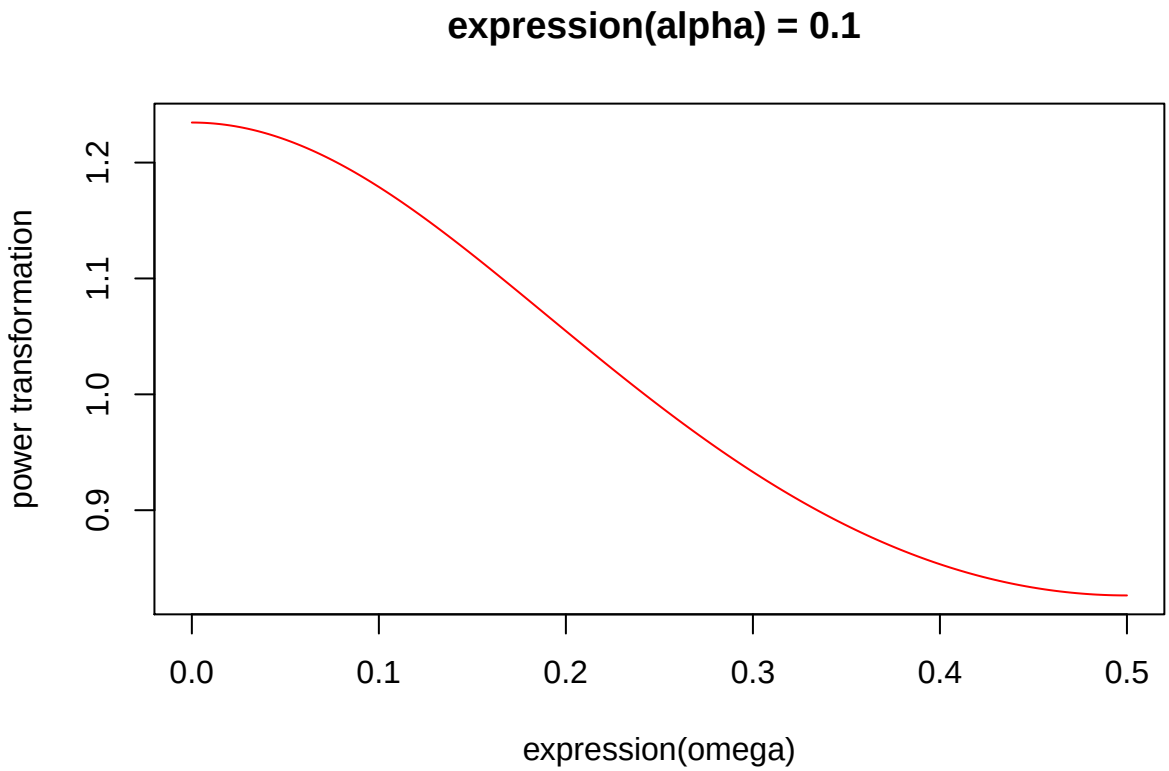


Comment:

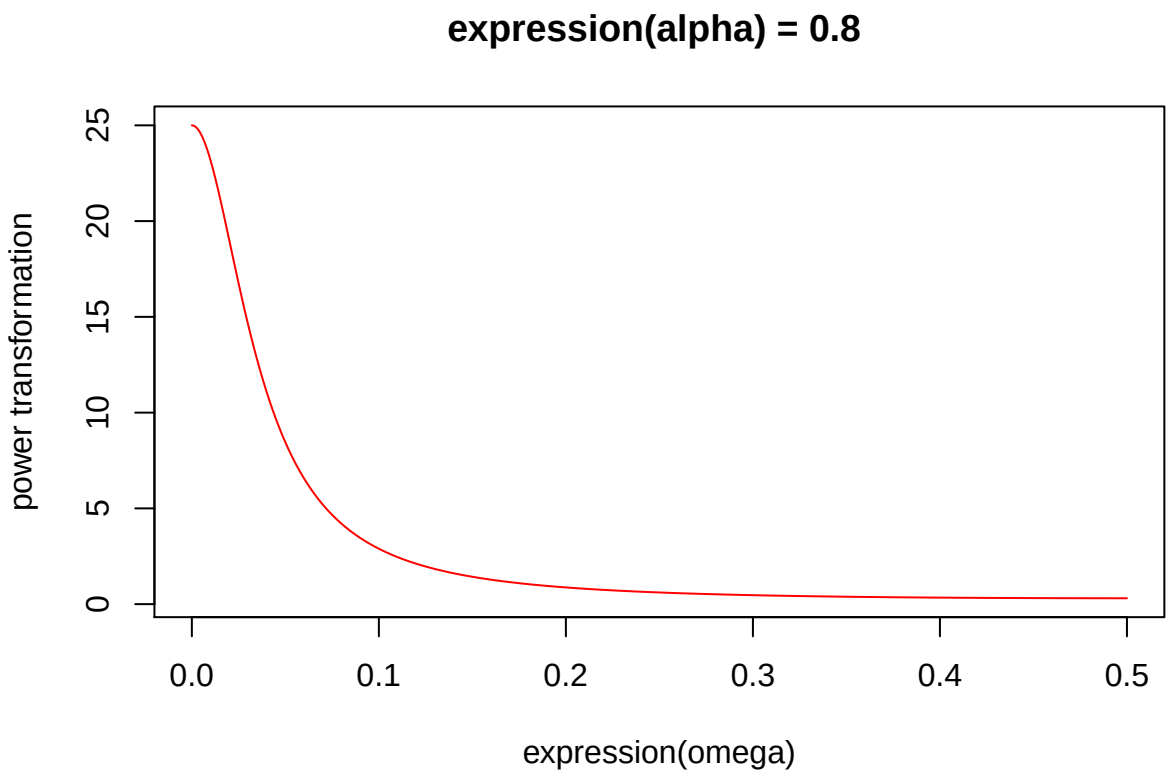
arma.spec or spectrum or periodogram or spec.pgram functions can also help me plot the predicted power transformation functions.

2 - b)

```
recursive1 <- function(x){1 / (1.01 - (0.2 * cos(2 * pi * x)))}
curve(recursive1, 0, 1/2, n = 2000, col = "red", xlab = "expression(omega)", ylab = "power transformati
      main = "expression(alpha) = 0.1 ")
```




```
recursive2 <- function(x){1 / (1.64 - (1.6 * cos(2 * pi * x)))}
curve(recursive2, 0, 1/2, n = 2000, col = "red", xlab = "expression(omega)", ylab = "power transformati
      main = "expression(alpha) = 0.8 ")
```

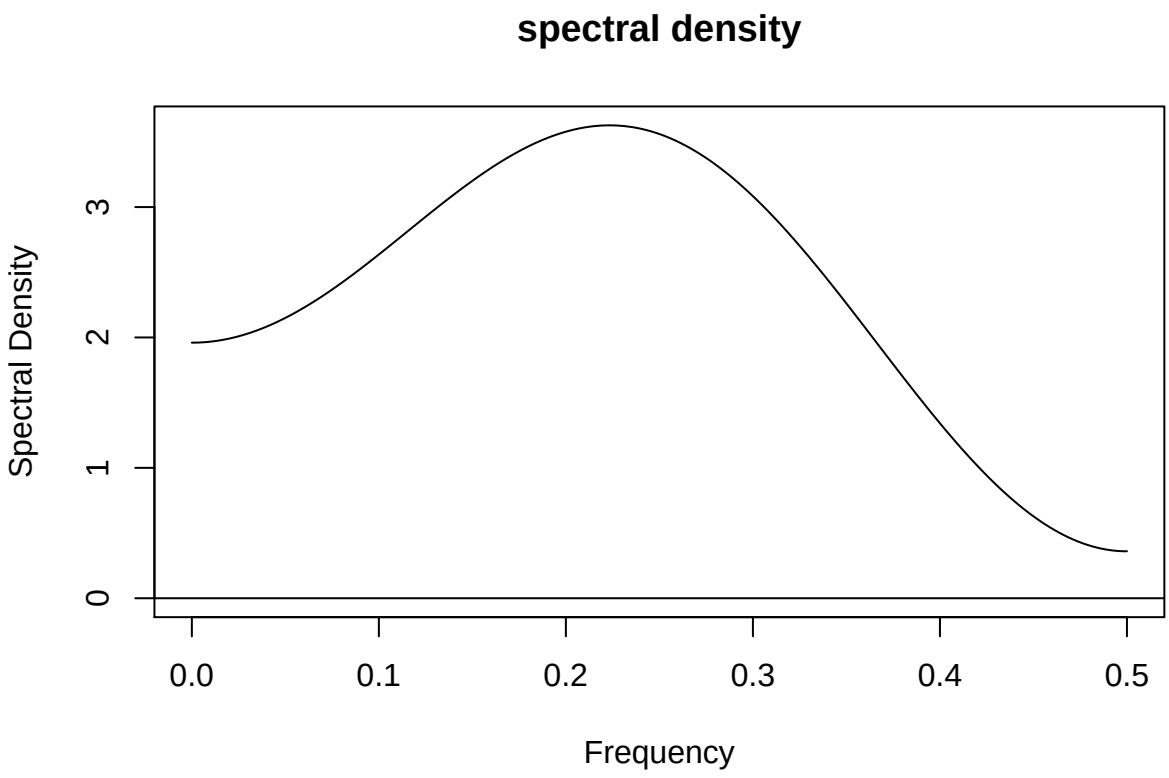


4 - c)

```r
# arma.spec(ma = c(1, -0.6), log = "no", main = "Moving Average") -> does not work, since this function

#arma.spec(ma = -c(1, -0.6), log = "no", main = "Moving Average") -> cannot use it since it is not inve

ARMAspec(model = list(ma = c(1, -0.6)), main = "spectral density")
```




```
ma2 <- function(x){2.36 + 0.8 * cos(2 * pi * x) - 1.2 * cos(4 * pi * x)}
curve(ma2, 0, 1/2, n = 2000, col = "red", xlab = "expression(omega)", ylab = "spectral density",
      main = "MA(2) spectral density")
```