Lösning till övningar Lektion 3

1a, $l_T = \alpha y_T + (1-\alpha)(l_{T-1} + b_{T-1})$

$b_T = \gamma(l_T - l_{T-1}) + (1-\gamma) b_{T-1}$

$\alpha = \gamma = 0.2$ $y_T = 41.2$ för $T = 2013 - 2017$

$l_{2014} = 0.2 \cdot 41.2 + 0.8(41.3639 + 0.071)$
$= 41.3879$

$b_{2014} = 0.2(41.3879 - 41.3639) + 0.8 \cdot 0.071$
$= 0.0616$

$l_{2015} = 0.2 \cdot 41.2 + 0.8(41.3879 + 0.0616)$
$= 41.3996$

$b_{2015} = 0.2(41.3996 - 41.3879) + 0.8 \cdot 0.0616$
$= 0.0516$

b $\hat{y}_{16}(15) = l_{15} + b_{15} = 41.3996 + 0.0516$
$= 41.45$

$\hat{y}_{17}(15) = 41.3996 + 2 \cdot 0.0516 = 41.50$

prognosfel $= y_{16} - \hat{y}_{16} = 41.2 - 41.45 = -0.25$

$y_{17} - \hat{y}_{17} = 41.2 - 41.50 = -0.30$

2, Fyll i tabellen $\alpha = 0.66$ $\gamma = 0.07$

$l_{35} = 0.66 \cdot 40283 + 0.34(33123,6 - 418.763)$
$= 37706.4$ Se formler uppg 1

$b_{35} = 0.07(37706.4 - 33123.6) + 0.93(-418.763)$
$= -68.65$

$l_{36} = 0.66 \cdot 38291,1 + 0.34(37706.4 - 68.65)$
$= 38068.9$

$b_{36} = 0.07(38068.9 - 37706.4) + 0.93(-68.65)$
$= -38.47$

3, a) $e_4 = y_4 - \hat{y}_4(3) = 60 - 47.57 = 12.43$

$\hat{y}_5(4) = l_4 + b_4 = 50.06 + 0.826 = 50.89$

$e_5 = y_5 - \hat{y}_5(4) = 56 - 50.89 = 5.11$

$b_6 = 0.2(56.55 - 51.91) + 0.8 \cdot 1.031$

$= 1.753$

$\hat{y}_6(5) = 51.91 + 1.031 = 52.94$

$e_6 = y_6 - \hat{y}_6(5) = 71 - 52.94 = 18.06$

$l_7 = 0.2 \cdot 68 + 0.8 \cdot (56.55 + 1.753) =$

$= 60.24$

$b_7 = 0.2(60.24 - 56.55) + 0.8 \cdot 1.753 =$

$= 2.14$

$\hat{y}_7(6) = 56.55 + 1.753 = 58.30$

$e_7 = 68 - 58.30 = 9.70$

b) $MSD = \frac{1}{5} \sum_{t=2}^{6} (y_t - \hat{y}_t(t-1))^2 =$

$= \frac{1}{5}(1.70^2 + 15.30^2 + 12.43^2 + 5.11^2 + 18.06^2)$

$= \frac{743.76}{5} = 148.75$

$MAD = \frac{1}{5} \sum_{t=2}^{6} |y_t - \hat{y}_t(t-1)| =$

$= \frac{1}{5}(1.7 + 15.3 + 12.43 + 5.11 + 18.06) = 111.70$ (698)

$MAPE = \frac{1}{5} \sum_{t=2}^{6} \left| \frac{y_t - \hat{y}_t(t-1)}{y_t} \right| =$

$= \frac{1}{5}\left(\frac{1.7}{48} + \frac{15.3}{35} + \frac{12.43}{60} + \frac{5.11}{56} + \frac{18.06}{71}\right)$

$= 0.2051 = 20.51\%$

4, a)

År	07	08	09	10
KPI(07)	100	103.5	103.2	104.5

ex År 10 $104.5 = \frac{303.5}{290.5} \cdot 100$

b)

År	07	08	09	10
Gräns(07)	661	929.5	1079.5	1078.5

ex År 08 $\frac{962}{103.5} \cdot 100 = 929.5$

c) $\frac{1078.5}{661} \cdot 100 = 163.2$

Den reella förändringen är 63.2% ökning i försäljning.
Den nominella förändringen är den faktiska utan att justera för inflation

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5) $I_{08} = 100$

$L_{08,09} = \frac{1125}{1050} \cdot \frac{127}{127+177} + \frac{1970}{1750} \cdot \frac{177}{304} = 1.103$

$I_{09} = 110.3$

$L_{09,10} = \frac{1200}{1125} \cdot \frac{127.3}{127.3+178.8} + \frac{2210}{1970} \cdot \frac{178.8}{306.1} =$

$= 1.0989$

$I_{10} = 1.103 \cdot 1.0989 \cdot 100 = 121.2$