

# Homework Solutions

## Applied Regression Analysis

### WEEK 6

#### Exercise Three

Using a single model determine the regression of *max\_grip* on *MVdays* for each of the two SOFA score groups.

To use a single regression model, we need to include the interaction term.

Type “gen MVxSOF = MVdays\*sofa11” in the command window to obtain the interaction term.

Now that we have the interaction term, we can use the regress command. Type “regress max\_grip sofa11 MVdays MVxSOF” in the command window to obtain the regression output.

```
. gen MVxSOF= MVdays*sofa11
. regress max_grip sofa11 MVdays MVxSOF
```

Source	SS	df	MS			
Model	3297.36312	3	1099.12104	Number of obs =	137	
Residual	22063.7172	133	165.89261	F( 3, 133) =	6.63	
Total	25361.0803	136	186.478532	Prob > F =	0.0003	
				R-squared =	0.1300	
				Adj R-squared =	0.1104	
				Root MSE =	12.88	

  

max_grip	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
sofa11	-10.30809	6.97879	-1.48	0.142	-24.11187	3.495683
MVdays	-.6937794	.1864576	-3.72	0.000	-1.062585	-.3249735
MVxSOF	.4083585	.3851152	1.06	0.291	-.3533845	1.170101
_cons	21.18421	1.991451	10.64	0.000	17.24519	25.12322

  

```
. regress max_grip sofa11 MVdays
```

Source	SS	df	MS			
Model	3110.84167	2	1555.42084	Number of obs =	137	
Residual	22250.2386	134	166.046557	F( 2, 134) =	9.37	
Total	25361.0803	136	186.478532	Prob > F =	0.0002	
				R-squared =	0.1227	
				Adj R-squared =	0.1096	
				Root MSE =	12.886	

  

max_grip	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
sofa11	-4.315677	4.096519	-1.05	0.294	-12.41788	3.786524
MVdays	-.5980555	.1632222	-3.66	0.000	-.9208806	-.2752305
_cons	20.35026	1.830419	11.12	0.000	16.73001	23.97051

From this output, we see that the interaction between SOFA score group and *MVdays* is not significant so we can use the following model that assumes the groups have the same slope:

$\text{max\_grip} = 20.35026 - 4.32 \times \text{sofa11} - .60 \times \text{MVdays}$ . So, for  $\text{sofa11}=0$ ,  $\text{max\_grip} = 20.35026 - .60 \times \text{MVdays}$  and, for  $\text{sofa11}=1$ ,  $\text{max\_grip} = 20.35026 - 4.32 \times 1 - .60 \times \text{MVdays} = 16.03 - .60 \times \text{MVdays}$ .