

Economics 312
Daily Problem #15

Spring 2020
February 21

Our data set pizza4.dta is described by the following definition file:

```

Obs:    40 individuals

pizza    annual pizza expenditure, $
female   =1 if female
hs       =1 if highest degree received is high school diploma
college  =1 if highest degree received is a college diploma
grad     =1 if highest degree received is a post graduate degree
income   annual income in thousands of dollars
age      age in years
    
```

Variable	Obs	Mean	Std. Dev.	Min	Max
pizza	40	191.55	155.8806	0	590
female	40	.525	.5057363	0	1
hs	40	.375	.4902903	0	1
college	40	.375	.4902903	0	1
grad	40	.075	.2667468	0	1
income	40	55.8025	51.16614	7.8	288.6
age	40	33.475	10.25317	18	55

The variable fem_inc is the product female × income:

```
gen fem_inc=female*income
```

Consider the following regression:

```
. reg pizza female income age fem_inc
```

Source	SS	df	MS	Number of obs = 40		
Model	697127.141	4	174281.785	F(4, 35)	=	24.35
Residual	250524.759	35	7157.85025	Prob > F	=	0.0000
Total	947651.9	39	24298.7667	R-squared	=	0.7356
				Adj R-squared	=	0.7054
				Root MSE	=	84.604

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
female	-128.7496	42.28031	-3.05	0.004	-214.5832	-42.91606
income	2.636669	.5123064	5.15	0.000	1.596632	3.676706
age	-8.272247	1.49879	-5.52	0.000	-11.31495	-5.229542
fem_inc	-1.095241	.581824	-1.88	0.068	-2.276407	.0859241
_cons	420.4974	54.26929	7.75	0.000	310.3249	530.6699

The estimated covariance matrix of the coefficients from this regression is:

	female	income	age	fem_inc	_cons
female	1787.6244				
income	13.491083	.26245784			
age	.74684932	-.2299959	2.2463713		
fem_inc	-19.009203	-.24173923	.02763713	.33851911	
_cons	-1168.352	-7.060772	-63.55174	12.785672	2945.1553

1. How much of a \$1000 increase in income do we estimate that a male spends on pizza?
2. How much of a \$1000 increase in income do we estimate that a female spends on pizza?
3. Is the difference between these values statistically significant?
4. What is our estimate of the difference between pizza expenditures between a male and female of the same age each with \$20,000 of income?
5. What test and test statistic would you use to test if this difference is statistically significant?