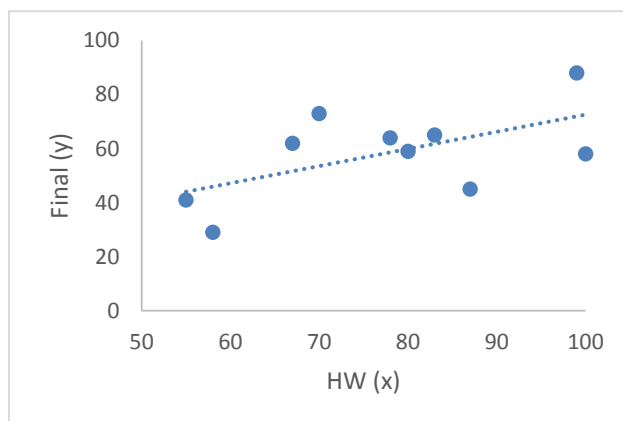


MATH202 Simple Linear Regression

The homework and final exam scores of a random sample of 10 students are shown below. Let x = homework score and y = final exam score. From the scatterplot, a reasonable model for these data is $y = \beta_0 + \beta_1x + \varepsilon$.

HW (x)	Final (y)	$(x - \bar{x})^2$	$(x - \bar{x})(y - \bar{y})$	\hat{y}	$y - \hat{y}$	$(y - \hat{y})^2$
67	62	114.49	-38.52	51.63460733	10.36539267	107.4413653
78	64	0.09	1.68	58.58968391	5.410316093	29.27152023
70	73	59.29	-112.42	53.53144639	19.46855361	379.0245795
99	88	453.69	630.48	71.86755738	16.13244262	260.255705
83	65	28.09	34.98	61.75108235	3.248917648	10.55546588
87	45	86.49	-124.62	64.28020111	-19.28020111	371.7261548
55	41	515.29	394.98	44.04725106	-3.047251059	9.285739017
58	29	388.09	579.18	45.94409013	-16.94409013	287.1021902
80	59	5.29	1.38	59.85424328	-0.854243285	0.72973159
100	58	497.29	-8.92	72.49983707	-14.49983707	210.2452749
777	584	2148.1	1358.2		3.55271E-14	1665.637726

1. Find \bar{x} , \bar{y} , SS_{xx} , SS_{xy} , $\hat{\beta}_0$, and $\hat{\beta}_1$.



2. Write down the equation of the least squares (estimated) regression line. Interpret the number you get for $\hat{\beta}_1$ in terms of this problem.

Regression Analysis: Final (y) versus HW (x)

The regression equation is
 Final (y) = 9.3 + 0.632 HW (x)

Predictor	Coef	SE Coef	T	P
Constant	9.27	24.62	0.38	0.716
HW (x)	0.6323	0.3113	2.03	0.077

S = 14.4293 R-Sq = 34.0% R-Sq(adj) = 25.8%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	858.8	858.8	4.12	0.077
Residual Error	8	1665.6	208.2		
Total	9	2524.4			

Predicted Values for New Observations

New Obs	Fit	SE Fit	95% CI	95% PI
1	66.18	5.96	(52.44, 79.91)	(30.18, 102.18)

Values of Predictors for New Observations

New Obs	HW (x)
1	90.0

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.583253553
R Square	0.340184707
Adjusted R Square	0.257707795
Standard Error	14.4293006
Observations	10

ANOVA

	df	SS	MS	F	Significance F
Regression	1	858.7622736	858.7622736	4.124605297	0.076748517
Residual	8	1665.637726	208.2047158		
Total	9	2524.4			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	9.271868163	24.61676566	0.376648512	0.716228548	-47.49449524	66.03823156
HW (x)	0.632279689	0.311327894	2.03091243	0.076748517	-0.085643721	1.350203099

