Data source and definitions explained

This data is from Mendenhall and Sincich. Professor WR Stephenson at

Iowa State University said that the price used in the data should be pounds.

	"Age"(independent)	"Bidders"(independent)	"Price"(dependent)
"1"	127	13	1235
"2"	115	12	1080
"3"	127	7	845
"4"	150	9	1522
"5"	156	6	1047
"6"	182	11	1979
"7"	156	12	1822
"8"	132	10	1253
"9"	137	9	1297
"10"	113	9	946
"11"	137	15	1713
"12"	117	11	1024
"13"	137	8	1147
"14"	153	6	1092
"15"	117	13	1152
"16"	126	10	1336
"17"	170	14	2131
"18"	182	8	1550
"19"	162	11	1884
"20"	184	10	2041
"21"	143	6	854
"22"	159	9	1483
"23"	108	14	1055
"24"	175	8	1545
"25"	108	6	729
"26"	179	9	1792

"27"	111	15	1175
"28"	187	8	1593
"29"	111	7	785
"30"	115	7	744
"31"	194	5	1356
"32"	168	7	1262

Research question

In our research, we are trying to find a linear relationship between price, age and bidders. With price as our dependent variable and age and bidders as our independent variable. From the two graphs below we can see there is an approximate linear relationship between bidders and price and age and price. So our research question make sense.
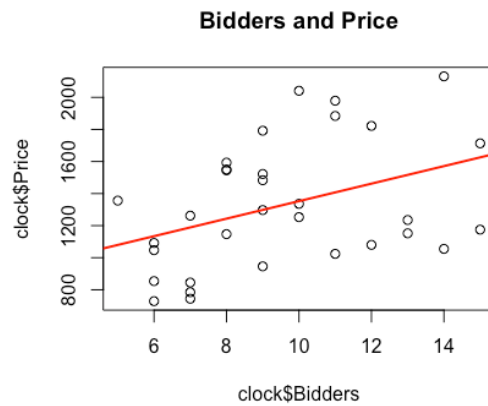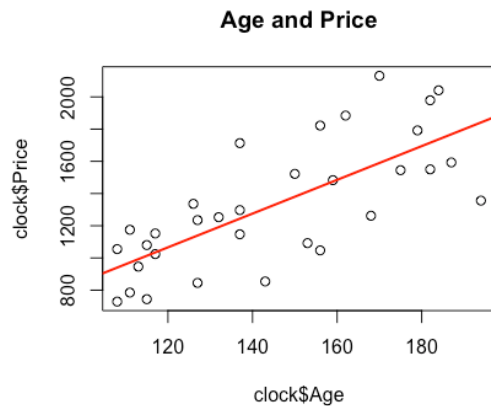
Method applied and interpreted

Here is the result we get from testing the multiple regression in R.

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Residuals:

   Min     1Q Median     3Q    Max
-207.2 -117.8   16.5  102.7  213.5


Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept) -1336.7221   173.3561  -7.711 1.67e-08 ***
Bidders         85.8151     8.7058   9.857 9.14e-11 ***
Age             12.7362     0.9024  14.114 1.60e-14 ***
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Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1


Residual standard error: 133.1 on 29 degrees of freedom
Multiple R-squared:  0.8927,     Adjusted R-squared:  0.8853
F-statistic: 120.7 on 2 and 29 DF,  p-value: 8.769e-15
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We can see the $Pr(>|t|)$ value is small for Bidders and Age. This means both these variables give good interpretation to Price. Also, $F(29) = 120.7$, $p < .0005$, $R^2 = .893$, this means we can reject the null hypothesis. In another word, bidders and age can statistically significantly predicted selling price.

The regression equation is:

$$Y = -1336.7221 + 85.8151(Bidders) + 12.7362(Age)$$

This means, as bidders goes up by one, price might go up by 85.8151, and as age go up by 1 the price might go up by 12.7362.