	ASSESSED VALUE	COST VALUE	MARKET VALUE	ORIGINAL ASR	COST ASR	MARKET ASR
MEAN	**$354,555**	**$418,014**	**$414,840**	86.50%	*102.74%*	101.79%
MEDIAN	**$354,400**	**$424,192**	**$420,486**	86.00%	*100.91%*	100.46%
MINIMUM	*$116,600*	*$203,830*	*$202,484*	*66.46%*	*76.40%*	*68.86%*
MAXIMUM	*$650,000*	*$674,919*	*$694,669*	*124.96%*	*203.50%*	*189.33 %*
RANGE:	**$533,400**	**$471,089**	**$492,185**	58.50%	*127.11%*	120.47%

1. a) Assessed value in previous year (ASSESVAL)

Mean: $354,555

Median: $354,400

Range: MIN $145,700; MAX $632,000 RANGE: $486,300

Market value estimated by applying the cost approach to value (COSTVALU)

Mean: $418,014

Median: $424,192

Range: MIN $203,830; MAX $674,919; RANGE: $471,089

Market value estimated by applying the direct comparison approach to value (MKTVALU)

Mean: $414,840

Median: $420,486

Range: MIN $202,484; MAX $694,669; RANGE: $492,185

The above summarizes the results for single detached homes in Edmonton. The Assessed Value outlines the central tendencies and dispersions for the previous year, while the Cost Value and market Value are current appraised values. The results indicated that prices have increased since the assessed values found in the previous years. The central tendencies (mean and median) have increased, while the dispersion (range) have remained similar, with Cost Value showing a slight decrease and Market Value showing an increase in range. Increases in central tendencies can be due to an increase in market conditions, meaning the market is continuing to grow at a steady rate. Average house prices continue to increase, especially affecting lower end homes (as seen by the minimum) which have shown the greatest increase. The Cost Value indicates a difference of $6,178 between mean and median, or 1.48%, while Market Value indicates a difference of $5,646 between mean and median, or 1.36%. Based on this, market value is considered to be the most uniform estimate of determining value.

b) Assessment-sales ratio indicated by last year's assessed value and the sale price (ORIGASR)

Mean: 86.50

Median: 86.00

Range: MIN: 66.46 MAX: 124.96 RANGE: 58.50

Assessment-sales ratio indicated by the cost value estimate and sale price (COSTASR)

Mean: 102.74

Median: 100.91

Range: MIN: 76.40 MAX: 203.50 RANGE: 127.11

Assessment-sales ratio indicated by the direct comparison estimate and sale price (MRKTASR)

Mean: 101.79

Median: 100.46

Range: MIN: 68.86 MAX: 189.33 RANGE: 120.47

From the above findings we can see the Direct Comparison ASR has the tightest mean and median, with less findings outside the typical selling price. The range is the lowest for the previous year's assed value, as the Maximum price is considerably lower than the current years findings. Assessment-sales ratio (ASR) are calculated by dividing assessed value by selling price. ASRs are an average of results from many properties, either the median (middle value) or mean (average). From these findings we can see that Assessed Value an 86% of Selling Price value (using median), while the Cost Approach has a 100.91% of selling price, and the Direct Comparison Approach has 100.46%. Although Cost and Direct are higher than the assessed value, this is expected as prices have increased. From this analysis we can see that the Direct Comparison Approach provides the most accurate medication of the sale price. Overall assessed values appear to be low, as sale prices are typically higher than assed values. Both the Cost and Direct Comparison Approaches to Value are fairly accurate methods, however the range is tightened with the Direct Comparison Approach and the ratios are tighter, under a percentage point for the median, and just under 2% for the mean.

c) As shown in the statistical calculation of median, mean and range, the median is the best method of distribution with an odd number of observations, as the median value is the middle value. The median is less affected by outliers and skewed data than the mean, and is usually the preferred measure of central tendency when the distribution is not symmetrical, as seen by the statistical analysis found above.

2.

	ASSESSED VALUE	**COST VALUE**	**MARKET VALUE**
STANDARD DEVIATION	$72,668	$75,326	$77,119
VARIANCE	5,280,685,577	5,674,013,273	5,947,333,372
MEAN	$354,555	$418,014	$414,840
COEFFICIENT	20.50%	18.02%	18.59%

Standard Deviation is a quantity calculated to indicate the extent of deviation for a group as a whole, basically being a measure of how spread out numbers are. A small standard deviation means that the values in a statistical data set are close to the mean of the data set, on average, and a large standard deviation means that the values in the data set are farther away from the mean, on average. As a result, assessed value indicates it is the closest, or a $72,668 difference from the mean. The Cost Approach to Value has a middle ranged standard deviation, being $75,326 away from the mean, while the Direct Comparison Approach had the greatest standard deviation, have a $77,119 difference from the mean price.

Variance is the average of the squared differences from the Mean. Basically, it measures how far a set of numbers are spread out from their average value. The variance in the Assessed Value is 5,280,685,577, the Cost Approach variance is 5,674,01,273 and the variance in the Direct Comparison Approach is 5,947,33,372. By itself, variance is not often useful because it does not have a unit, which makes it hard to measure and compare. However, the square root of variance is the standard deviation, and that is both practical as a measurement. However, on the surface the variance shows the same results as the standard deviation.

The coefficient of variation (COV) is a measure of relative variability. It is equal to the ratio between the standard deviation and the mean. It is a useful statistic for comparing the degree of variation from one data series to another, even if the means are drastically different from one another. The standard deviation of two variables can't be compared in any meaningful way. By comparing the standard deviation and the mean, however, the COV makes every dispersion relative and yet independent of the underlying unit. As shown above, the Cost Approach to value has the lowest COV at18.02%, and therefore is considered low variance. Assessment Value was the highest COV at 20.5%, and therefore considered high variance. Direct Comparison Approach Value had the middle COV at 18.59%.

3.

ASSESSED VALUE CORRELATION COEFFICIENT	LIVING AREA	LOT SIZE	BEDROOMS
	0.8032	0.4081	0.4592

The correlation coefficient (a value between -1 and +1) tells you how strongly two variables are related to each other. A correlation coefficient of +1 indicates a perfect positive correlation. As variable X increases, variable Y increases. As variable X decreases, variable Y decreases. A correlation coefficient of -1 indicates a perfect negative correlation. As variable X increases, variable Z decreases. As variable X decreases, variable Z increases. A correlation coefficient near 0 indicates no correlation. As s result, the above information shows that living areas, lot size and bedrooms have a perfectly positive correlation between the assessed value. Living area has the strongest positive (uphill) correlation coefficient, while lot size and bedrooms are less strong, although they also have a positive correlation coefficient when compared to assessed value. Basically, as assed value increases, so typically does living area as does lot size and number of bedrooms. It doesn't necessarily mean we can predict assed value from the size of the living area, but this shows that they are definitely connected. If a house has a large living area, it is more likely to be at the higher end of the assed value. This also works with lot size and bedrooms, although it is less of an indicator than living space. Although you may not be able to determine the exact assessed value of a property using this method, it may help you determine a range of value, and if you are within an accurate range of value depending on the variables you are comparing (i.e. lot size).

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.386230876
R Square	0.14917429
Adjusted R Square	0.145863684
Standard Error	76052.96083
Observations	259

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	2.60627E+11	2.60627E+11	45.05951339	1.2166E-10
Residual	257	1.4865E+12	5784052851		
Total	258	1.74713E+12			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	273412.908	21339.239	12.813	0.000	231390.879	315434.938	231390.879	315434.938
X Variable 1	18.830	2.805	6.713	0.000	13.306	24.355	13.306	24.355

4. a) $Y = a + bX$

The linear regression equation information is given in the last output set (the coefficients column). The first entry in the “Intercept” row is “a” (the y-intercept) and the first entry in the “X” column is “b” (the slope).

b) Therefore: $y = 18.830X + 273,412$

$y = 18.830(3000) + 273,412$

$y = \$329,902$

c) y=148.47X +168,377

y=148.47(3,000) +168,377

y= $613,787

d) These figures are different as the Scatter Chart and Best Line Method are a more accurate way if determining the most accurate linear regression equation.

e) The standard error of the estimate (SEE) is a measure of the accuracy of predictions made with a regression line. From the data above we can determine the SEE is 77623.92. This statistic is used with the correlation measure, *R*. The computations derived from the r and the standard error of the estimate can be used to determine how precise an estimate is. The standard error of the estimate is a measure of the accuracy of predictions. In a regression line, the smaller the standard error of the estimate is, the more accurate the predictions are. As we can see from the SEE calculation, the standard error of the estimate is fair, not ideal but still a good indication of value, or in this case, price.

While the standard deviation measures the variability of a data set from the mean, the standard error of the mean (SEM) estimates how far the sample mean is likely to be from the true population mean. Said another way - if you took multiple samples from the same population, the standard error of the mean would show the dispersion between those sample means. Because usually we calculate just one mean for a set of data, not multiple means, the standard error of the mean is estimated rather than measured. SEM as a percentage of mean would be 5,219.71, or 1.27% of Mean Price.

f)

	ORIGASR	COSTASR	MRKTASR	ESTASR
STANDARD DEVIATION	7.63	12.49	11.79	74.94
MEDIAN	86.00	*100.91*	100.46	360.77

The above formula indicates that price versus living area is NOT a good indication of value. As seen, the Estimate ASR (ESTASR) Assessment-sales ratio indicated by the living space estimate and sale price is significantly higher than other methods of assessment-sales ratios used, with a higher median and higher standard deviation. Therefore the ESTASR indicates that the data points are spread over a wider range of values, while a low standard deviation indicates that the data points tend to be close to the mean (also called the expected value) of the set.