

# Visual Basic with SQL Database Programmer Competitive Position™ Market Report

Title	Page
<b>Preliminaries</b>	
Table of Contents	1
Copyright, Address and Disclaimers	2
Welcome Letter	3
<b>Salary Characteristics of the Job Market</b>	
Characteristics of the Sample Data	4
Sample Salary and Experience Averages and Variance	5
Equation of the Expected Salary Offer	6
Expected Salary Offer for Each Year of Required Experience	7
Extreme Salary Offers	
1 Year of Required Experience	8
2 Years of Required Experience	9
3 Years of Required Experience	10
4 Years of Required Experience	11
5 Years of Required Experience	12
<b>Reference</b>	
Graph Reference: Expected Salary Offer per Year of Experience	13
Graph Reference: Extreme Salary Offers	14
Statistical Test Results	15
Heteroscedasticity Correction	16

Copyright © 1997, 1998 by Whole Root™ Economic Research, Inc.  
All rights reserved.

Whole Root™ Economic Research, Inc  
P.O. Box 603  
South Glastonbury, CT 06073

**<http://www.wholeroot.com/>**

Toll Free: 1-888-413-1792  
Fax: (860) 659-1792  
E-mail: [reports@wholeroot.com](mailto:reports@wholeroot.com)

This License allows a **single user** to store, backup and print this  
Competitive Position™ Market Report.

You must reproduce the Whole Root™ Economic Research, Inc. copyright notice on all  
prints.

You may not modify, network, sell, subscribe, loan, electronically transfer or distribute this  
Competitive Position™ Market Report in whole or in part.

Whole Root™ Economic Research, Inc. has carried out the Competitive Position™ Market  
Analysis and prepared the Competitive Position™ Market Report according to accepted  
statistical standards. The statistics present information about the data source. Possible biases  
and other errors may exist within the data source that Whole Root™ Economic Research, Inc.  
is not responsible for. Individual job placements can not be identified. Job placement and/or  
salary improvement is not guaranteed nor offered.

The New York Times and the Washington Post are not associated with, do not endorse, and  
are not responsible for Competitive Position™ Market Analysis, Competitive Position™  
Market Reports or Whole Root™ Economic Research in anyway.

Computer hardware and/or software firms are not associated with, do not endorse, and are  
not responsible for Competitive Position™ Market Analysis, Competitive Position™ Market  
Reports or Whole Root™ Economic Research in anyway.

# Welcome

I established Whole Root™ Economic Research, Inc. in 1996 to provide extensive market analysis to individual decision makers. My Competitive Position™ Market Reports enable individuals to assess salary opportunities and set employment goals. It is the first affordable market analysis designed specifically to assist all participants in the job marketplace. Whether you are a computer professional, data processing manager or human resource professional, I hope you find this material useful.

Thank you,

Robert Gerald Vivona  
Economic Statistician

Toll Free: 1-888-413-1792

Fax: (860) 659-1792

E-mail: [bob@wholeroot.com](mailto:bob@wholeroot.com)

A Special Thanks to:

Nicholas Vivona  
Computer Industry Consultant

# Visual Basic with SQL Programmer

## Characteristics of Sample Data

Sample Source: The **New York Times** Sunday Employment section  
 Dates: the 52 weeks (1 Year) from January 5 through December 28, 1997

Number of Classified Want Ads: 55

### Qualifications listed in the Want Ads

	To be Included Each Want Ad Must Have	Salary <b>Effectd</b> When Listed	Salary <b>Not Effectd</b> when Listed
Responsibility	Programmer, Programmer/Analyst, Analyst, Systems Analyst, Software Engineer or Designer/Developer		
Hardware / OS			
Language	Visual Basic		
Database	Oracle, Sybase, SQL Server or Informix		
Network			
MIS Software			
Industry			

### Job Description

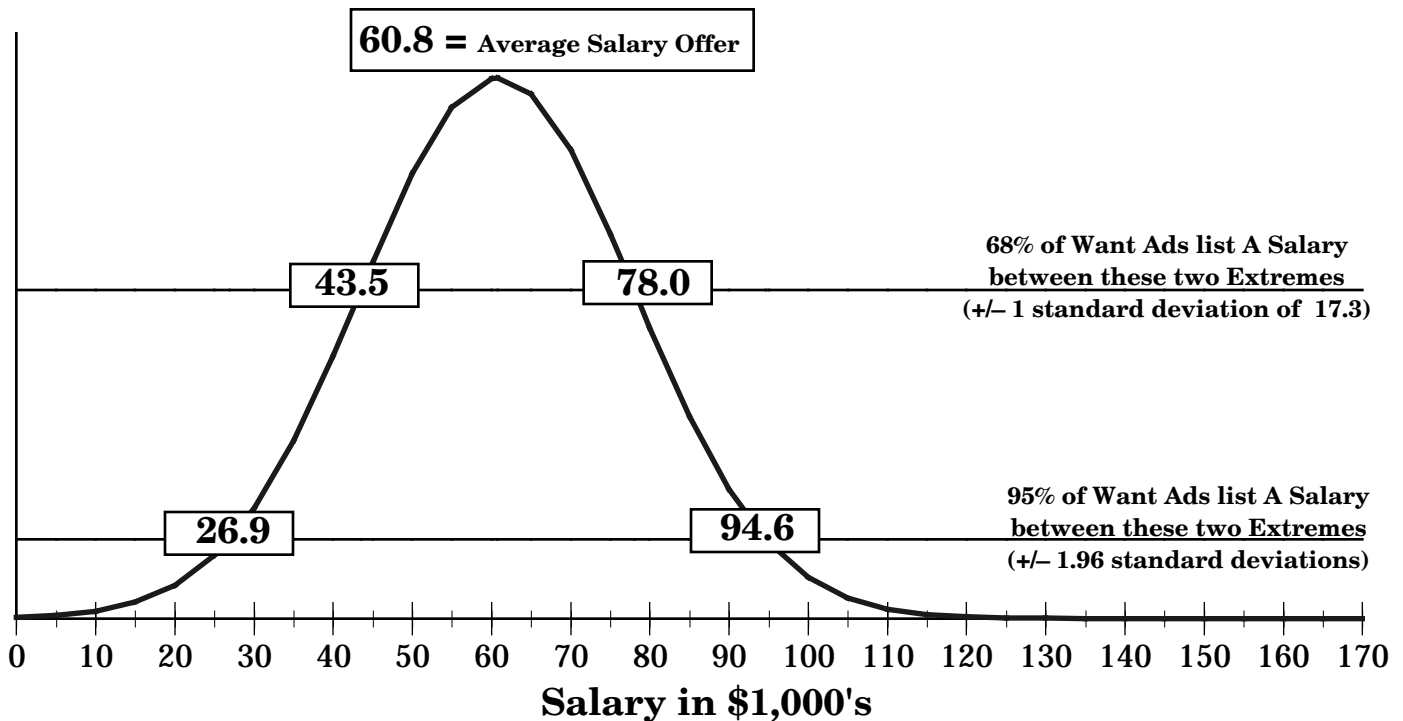
- Translates user requirements into design specifications for a new application, or, to reengineer and enhance existing applications
- Codes application modules based on a design document
- Integrates, Tests, Debugs and Implements application modules and documents the results

# Visual Basic with SQL DB Programmer Sample Averages and Distributions

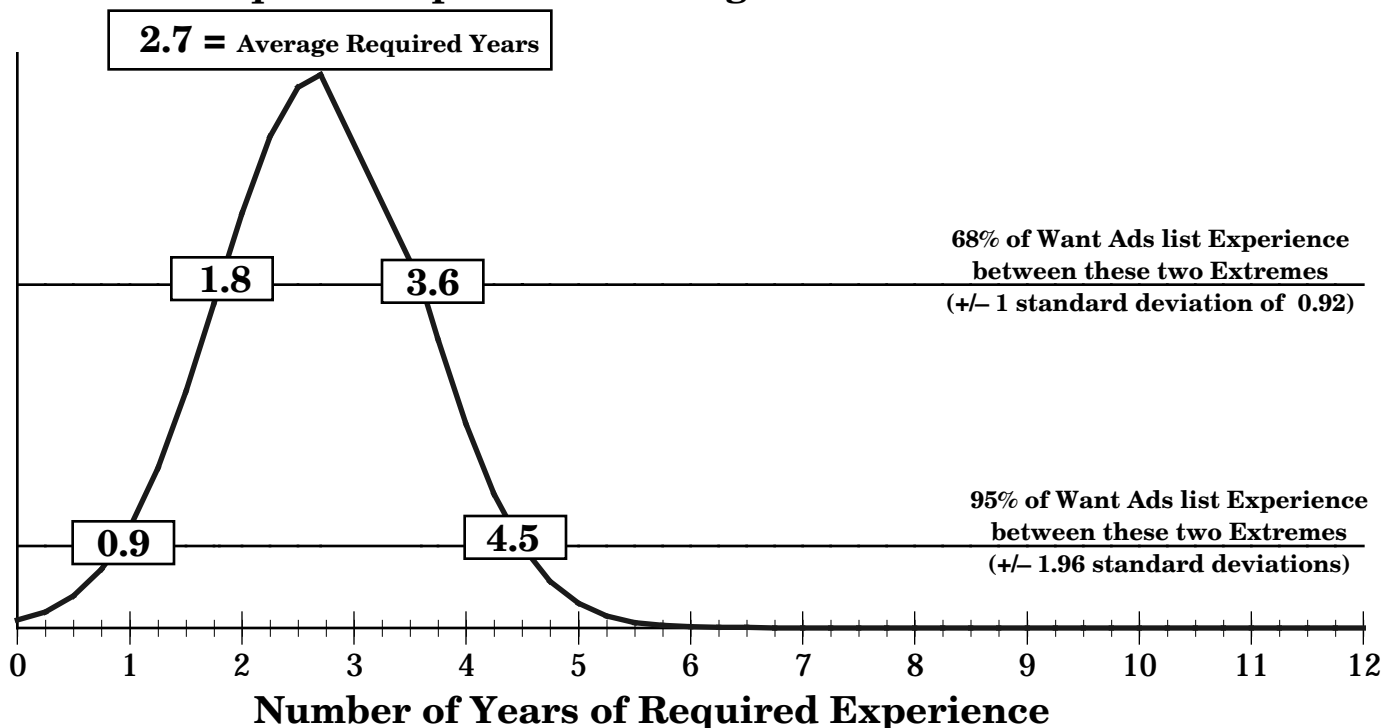
Sample Size: 55 Want Ads

Sample Source: The New York Times  
Sunday Employment section 52 Weeks from  
January 5 through December 28, 1997

## Salary Average and Distribution



## Required Experience Average and Distribution



# Visual Basic with SQL DB Programmer

## The Equation of the Expected Salary Offer

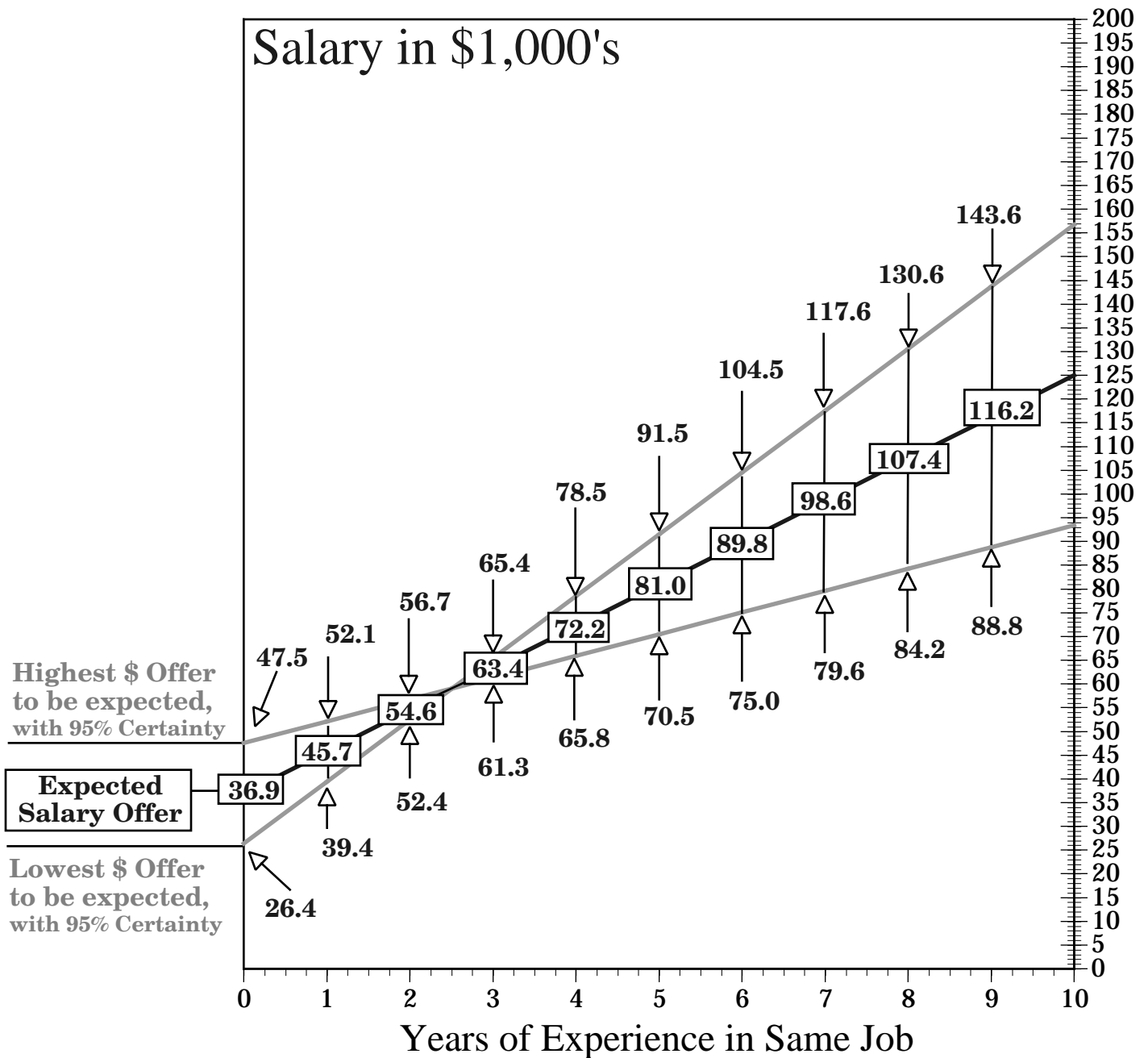
Salary offers are lowest at entry level and increase by a constant amount with each year of experience.

		<b>Entry Level</b>		<b>Year of Experience</b>	
				Dollars per Year Multiplied by Number of Years	
<b>Expected Salary Offer</b>	=	<b>\$36.9</b>	+	<b>\$8.8</b>	<b>Years</b>
<b>First 95% Confidence Bound of Expected Salary Offer</b>	=	<b>\$47.5</b>	+	<b>\$4.6</b>	<b>Years</b>
<b>Second 95% Confidence Bound of Expected Salary Offer</b>	=	<b>\$26.4</b>	+	<b>\$13.0</b>	<b>Years</b>

The first and second bounds are constructed from the upper and lower 95% confidence intervals, of the variables presented above, that minimize the confidence interval of the equation.

# Visual Basic w/SQL DB Programmer

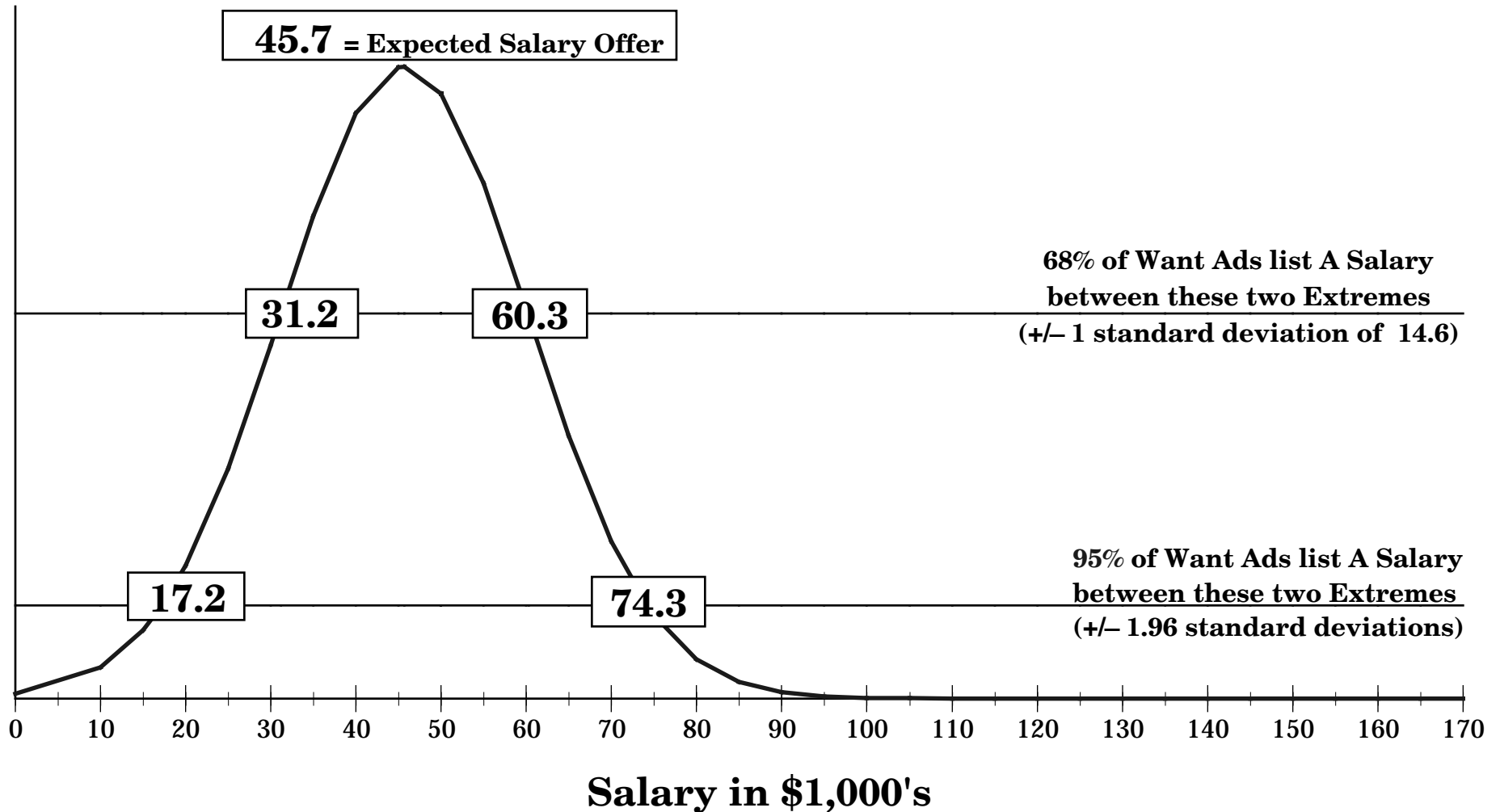
The Expected Salary Offer  
& its 95% Probability Range  
for Each Year of Required Experience



Sample Source: The New York Times  
Sunday Employment section 52 Weeks from  
January 5 through December 28, 1997

# Visual Basic with SQL DB Programmer

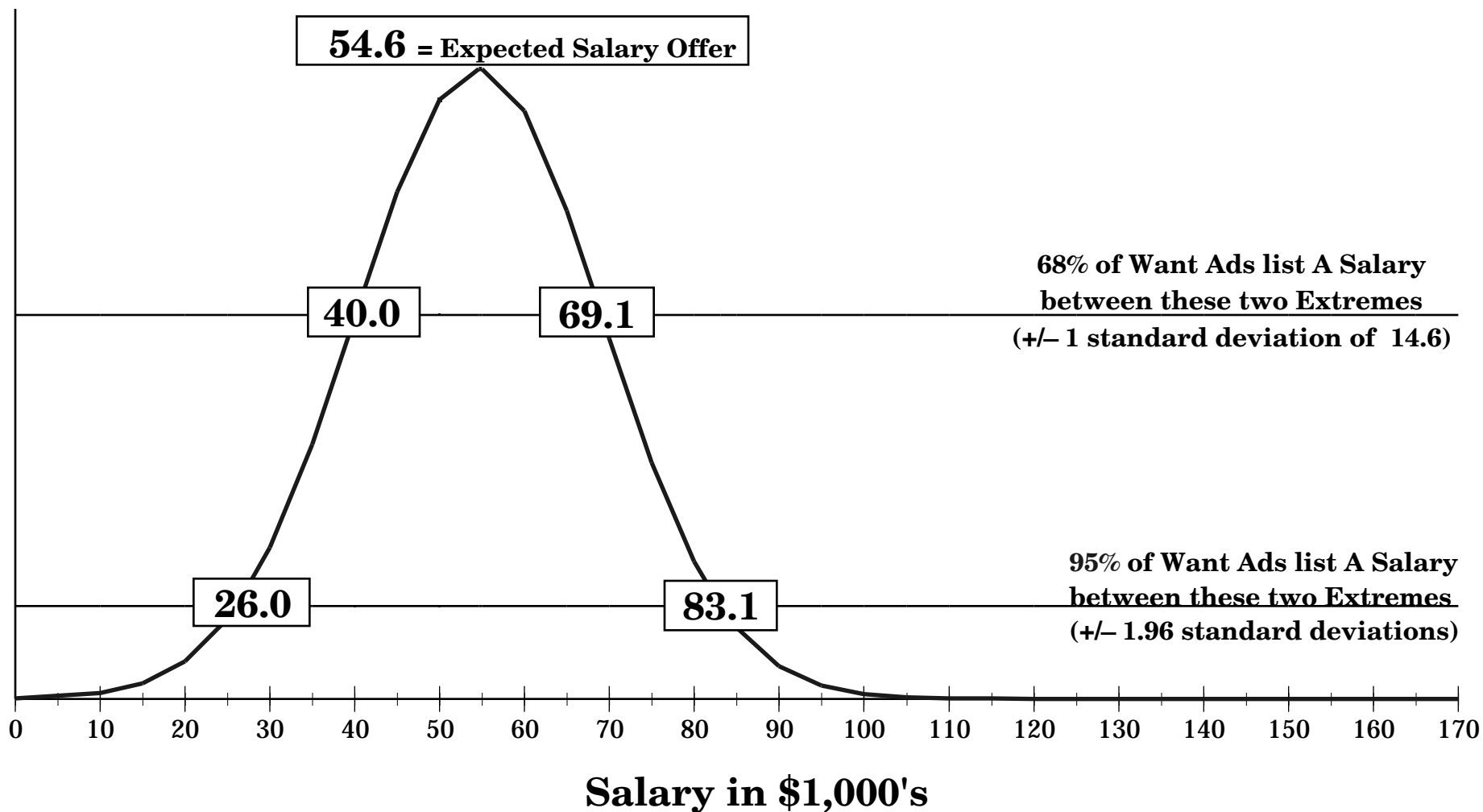
## Extreme Salary Offers: 1 Year of Required Experience



Sample Source: The New York Times  
Sunday Employment section 52 Weeks from  
January 5 through December 28, 1997

# Visual Basic with SQL DB Programmer

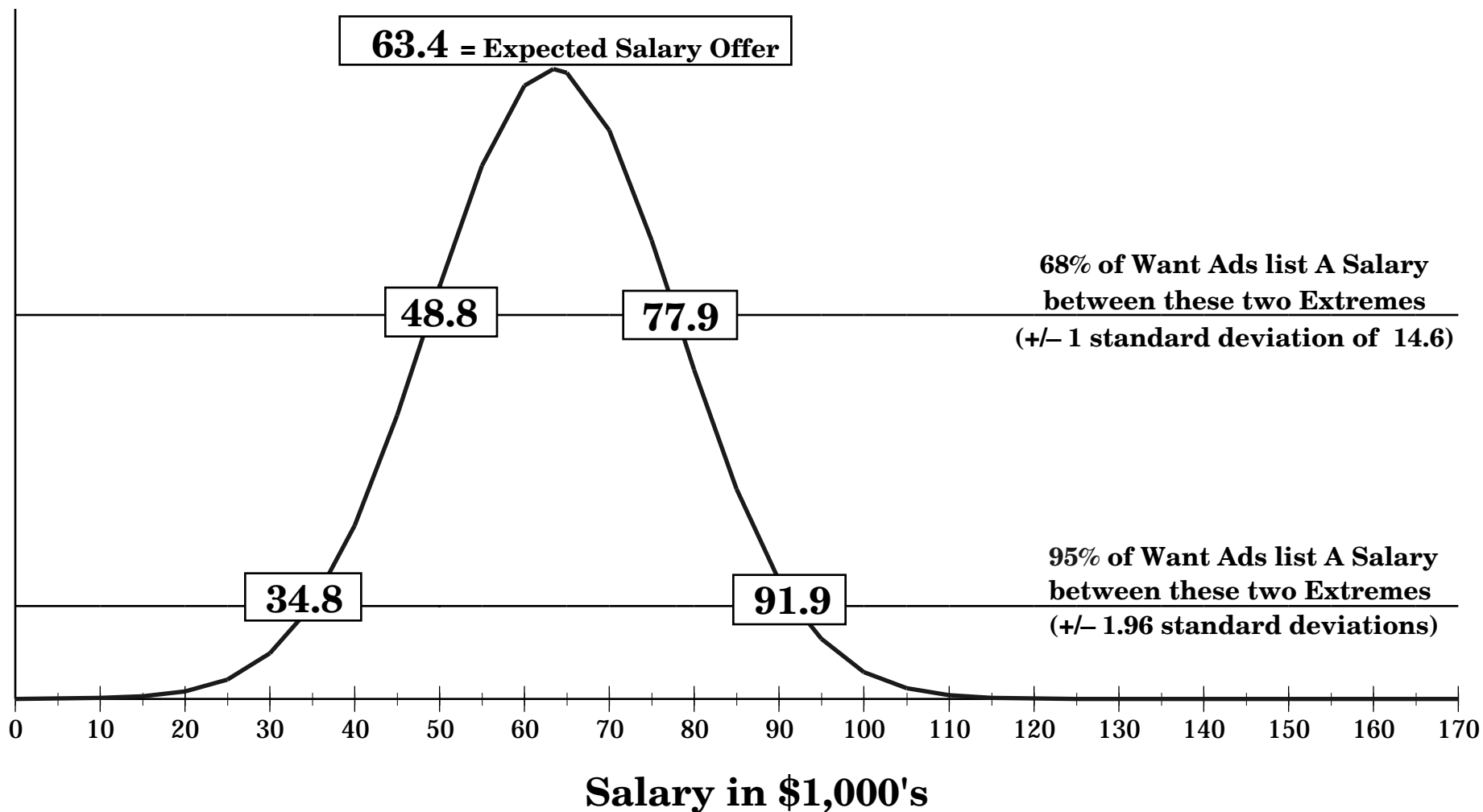
## Extreme Salary Offers: 2 Years of Required Experience



**Sample Source: The New York Times  
Sunday Employment section 52 Weeks from  
January 5 through December 28, 1997**

# Visual Basic with SQL DB Programmer

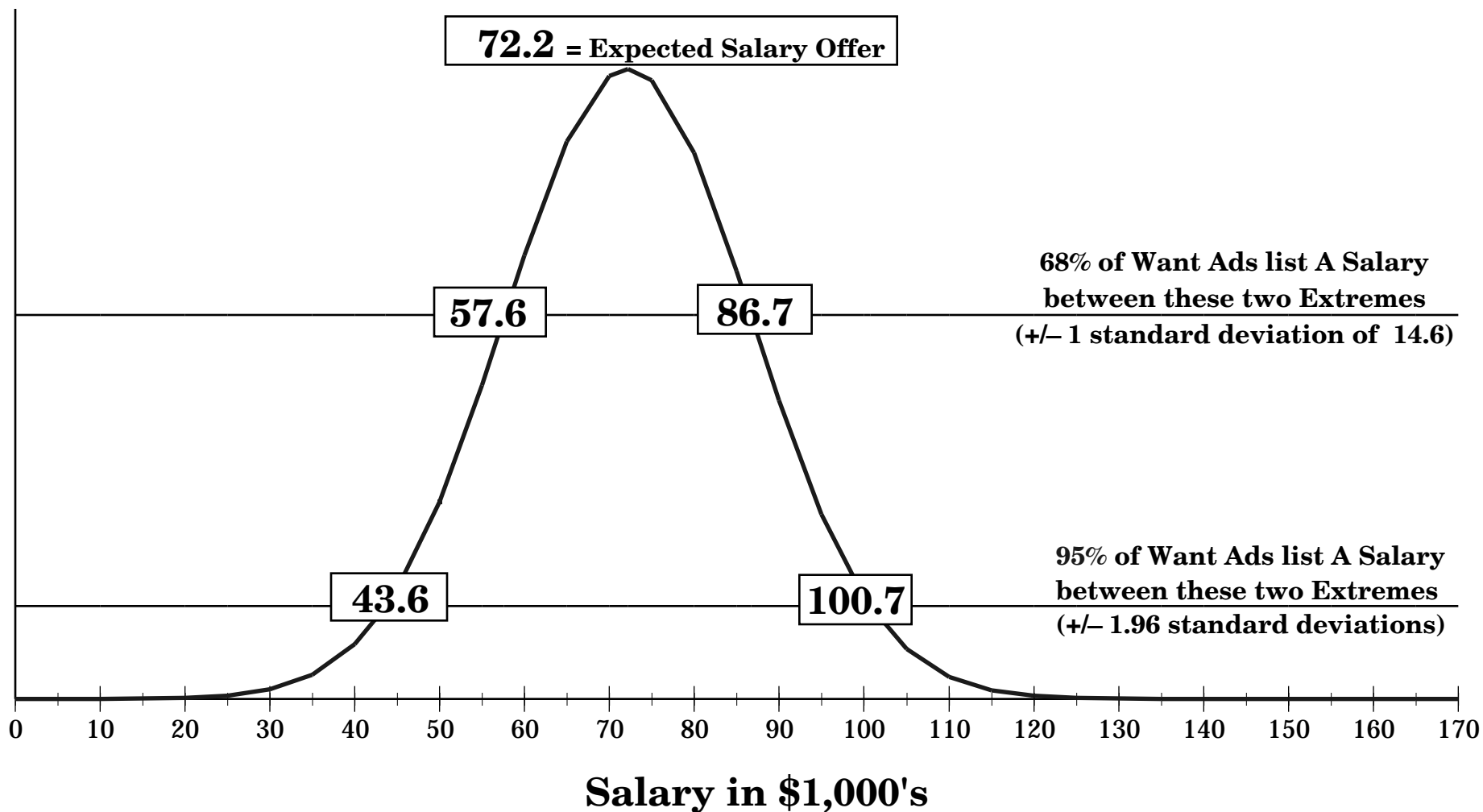
## Extreme Salary Offers: 3 Years of Required Experience



**Sample Source: The New York Times  
Sunday Employment section 52 Weeks from  
January 5 through December 28, 1997**

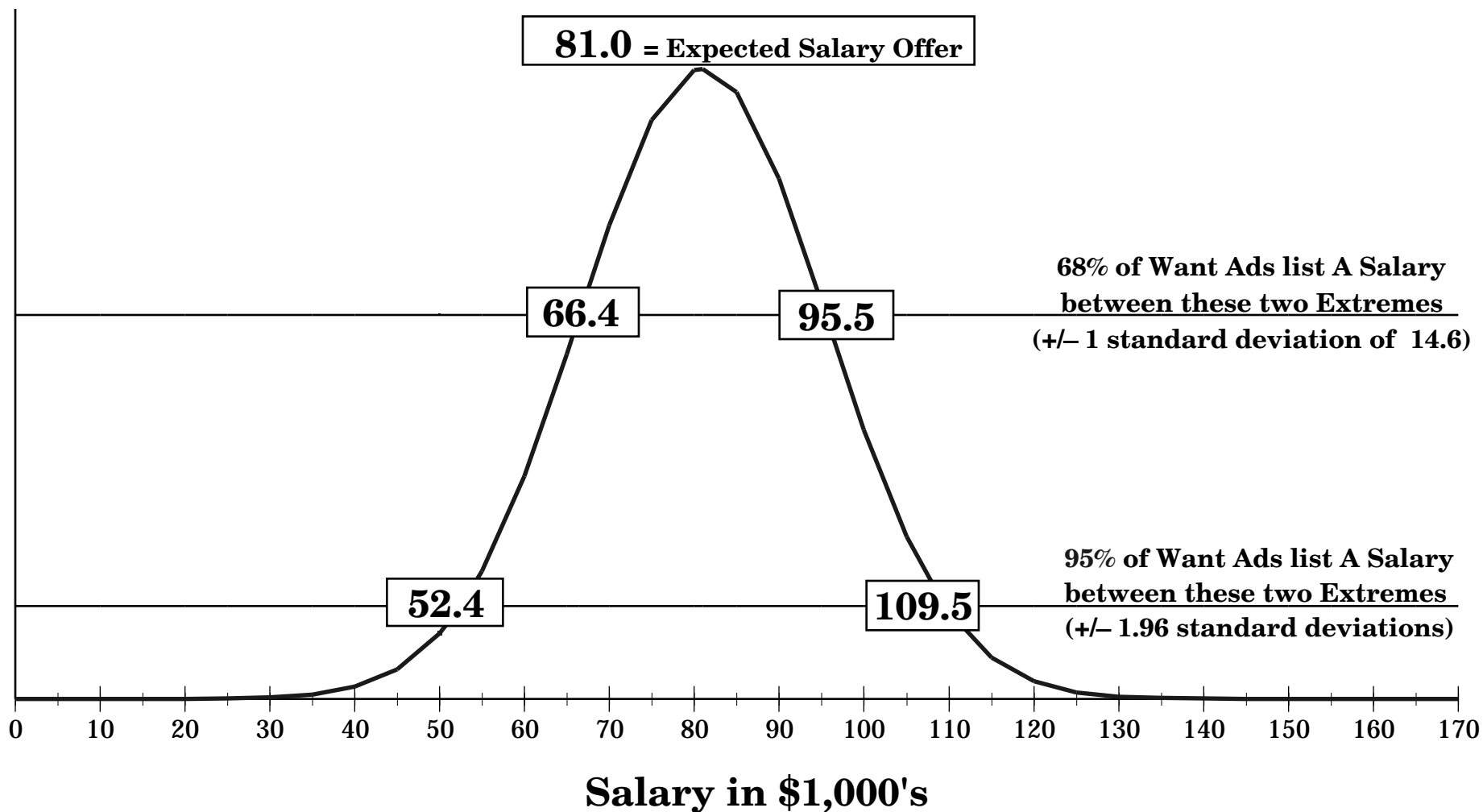
# Visual Basic with SQL DB Programmer

## Extreme Salary Offers: 4 Years of Required Experience



Sample Source: The New York Times  
Sunday Employment section 52 Weeks from  
January 5 through December 28, 1997

# Visual Basic with SQL DB Programmer Extreme Salary Offers: 5 Years of Required Experience



**Sample Source: The New York Times  
Sunday Employment section 52 Weeks from  
January 5 through December 28, 1997**

## **Graph Reference: Expected Salary Offer per Year of Experience**

### **The Middle Black Line**

This line depicts the expected salary offer for each year of required experience calculated from the sample of want ads.

The expected salary for each year of required experience is shown in a box on the line.

The expected salary is the most likely, and the average, salary offered.

### **The 95% Probability Lines Infer the Expected Salary Offer for the Entire Job Market**

The sample of classified want ads enables inferences to be made concerning the entire job market for this position.

The gray lines above and below the middle black line present the Highest and Lowest salary offers that can be expected in the entire job market.

There is a 95% certainty that the average salary offer, within the entire job market for this position, lies between the High and the Low numbers that point to the gray lines at each year of required experience.

### **Please Note:**

All three curves cross at the central tendency point.

The further the number of years of required experience is from the central tendency point, the larger the 95% probability region of the expected salary offer.

# Graph Reference: Extreme Salary Offers

## There are 3 statistics presented in this graph

Each statistic presents an assessment of the likelihood or frequency of a salary offer occurring:

= **Expected Salary Offer**

The expected salary offer is the most likely salary offer as calculated from the sample of want ads

**68% of Want Ads list a Salary between these two Extremes (+/- 1 standard deviation)**

The 68% probability extreme indicates the boundaries where salary offers become infrequent for the entire job market

**95% of Want Ads list a Salary between these two Extremes (+/- 1.96 standard deviations)**

The 95% probability extreme indicates the boundaries where salary offers become extremely infrequent for the entire job market

## Extreme Salaries

The 68% Probability Extremes:

Salary offers are unlikely above or below this range

Two Thirds (68%) of salary offers are in this range

Only 1/6th (16%) of salary offers are greater than the high number

Only 1/6th (16%) of salary offers are less than the low number

The 68% confidence interval is constructed by taking one standard deviation then adding it to and subtracting it from the expected salary offer

The 95% Probability Extremes

Salary offers are extremely unlikely above or below this range

95% of salary offers are in this range

Only 2.5% of salary offers are greater than the high number

Only 2.5% of salary offers are less than the low number

The 95% confidence interval is constructed by multiplying the standard deviation by 1.96 then adding it to and subtracting it from the expected salary offer

For the complete presentation of the expected salary offer please see the "Expected Salary Offer per Year of Experience" graph.

# Visual Basic with SQL DB Programmer

## Statistical Test Results

### Regression Corrected for Heteroscedasticity

Regression Summary  
Salary (H adj) vs. 2 Independents

Count	55
Num. Missing	0
R	.975
R Squared	.951
Adjusted R Squared	.949
RMS Residual	1.463

The expected salary offer line was corrected for heteroscedasticity (please view the Heteroscedasticity Correction page for specifics). A consequence of correctly accounting for the relationship within the variance is that the R Squared statistic is no longer accurate. The variation around the mean salary offer has been altered to correctly calculate the expected salary offer line with all available information.

The variability of salary offers around the Expected Salary Offer line is depicted in the 95% Probability Range of the expected salary offer and the Extreme Salary Offer Graphs.

The R Squared statistic calculates the percentage of the variation in salary offers away from the mean salary offer, explained by the expected salary offer line. An R Squared statistic of 1 would indicate that the expected salary offer line would be the only salary offered in the marketplace. A reasonable degree of variability should be expected due to the many factors influencing individual want ads.

ANOVA Table  
Salary (H adj) vs. 2 Independents

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	2	2182.340	1091.170	509.771	<.0001
Residual	53	113.447	2.141		
Total	55	2295.787			

Regression Coefficients  
Salary (H adj) vs. 2 Independents

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Entry Level (H adj)	36.940	5.280	.564	6.997	<.0001
Years (H adj)	8.809	2.106	.280	4.183	.0001

The statistical significance tests indicate a high level of quality for the expected salary offer numbers:

1. There is less than a .01% (one ten-thousandth) chance that there is no relationship between salary offers and experience requirements (P-Value in ANOVA Table).
2. There is less than a .01% (one ten-thousandth) chance that the entry level salary offer can't be defined (Entry Level P-Value in Regression Coefficients Table).
3. There is less than a .01% (one ten-thousandth) chance that the yearly increase in salary offer can't be defined (Years P-Value in Regression Coefficients Table).

# Visual Basic with SQL DB Programmer Heteroscedasticity Correction

## Heteroscedasticity Regression Test

Dependent Variable =  $\ln(\text{Resid}^2)$  Independent Variables:  $X_1 = \ln(\text{Week})$ ,  $X_2 = \ln(\text{Years})$

The variation in salary offers above and below the expected salary line increases at an increasing rate as the years of experience increase. In addition, the variation in salary offers above and below the expected salary line decreases at a decreasing rate with time.

This additional information is factored into the analysis by dividing all columns by:  
 $(e^{(4.785 - .453*\ln(\text{Week}) + 1.218*\ln(\text{Years}))}^{.5})$

When each want ad is weighted by its dependent effect on the variance, an unbiased expected salary offer line with constant variance is derived.

### Test Results

R <sup>2</sup> Statistic		F Statistic					
Count	55	DF	Sum of Squares	Mean Square	F-Value	P-Value	
Num. Missing	0	Regression	2	13.631	6.815	3.353	.0427
R	.338	Residual	52	105.680	2.032		
R Squared	.114	Total	54	119.311			
Adjusted R Squared	.080	t Statistics					
RMS Residual	1.426	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value	
		Intercept	4.785	.863	4.785	5.546	<.0001
		$\ln(\text{Week})$	-.453	.255	-.235	-1.774	.0819
		$\ln(\text{Years})$	1.218	.560	.288	2.174	.0343

### Original Regression Test Results with Heteroscedasticity

R <sup>2</sup> Statistic		F Statistic					
Count	55	DF	Sum of Squares	Mean Square	F-Value	P-Value	
Num. Missing	0	Regression	1	4878.455	4878.455	23.017	<.0001
R	.550	Residual	53	11233.472	211.952		
R Squared	.303	Total	54	16111.927			
Adjusted R Squared	.290	t Statistics					
RMS Residual	14.559	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value	
		Intercept	32.744	6.161	32.744	5.314	<.0001
		Years	10.377	2.163	.550	4.798	<.0001

### 95% Confidence Intervals

	Coefficient	95% Lower	95% Upper
Intercept	32.744	20.386	45.103
Years	10.377	6.039	14.716