# Financial C++ Programmer
# Competitive Position™ Market Report

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# 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

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A Special Thanks to:

Nicholas Vivona
Computer Industry Consultant

# Financial C++ 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: 57

## Qualifications listed in the Want Ads

| | To be Included Each Want Ad Must Have | Salary **Effected** When Listed | Salary **Not Effected** when Listed |
|---|---|---|---|
| Responsibility | Programmer, Programmer/Analyst, Analyst, Systems Analyst, Software Engineer or Designer/Developer | | |
| Hardware / OS | | | UNIX = 29<br>WindowsNT = 19 |
| Language | C++ | | |
| Database | | | Oracle, Sybase,<br>SQL Server or Informix = 28 |
| Network | | | |
| MIS Software | | | |
| Industry | Banking, Investment Banking, Financial, Wall Street, Insurance or Accounting | | |

## Job Description

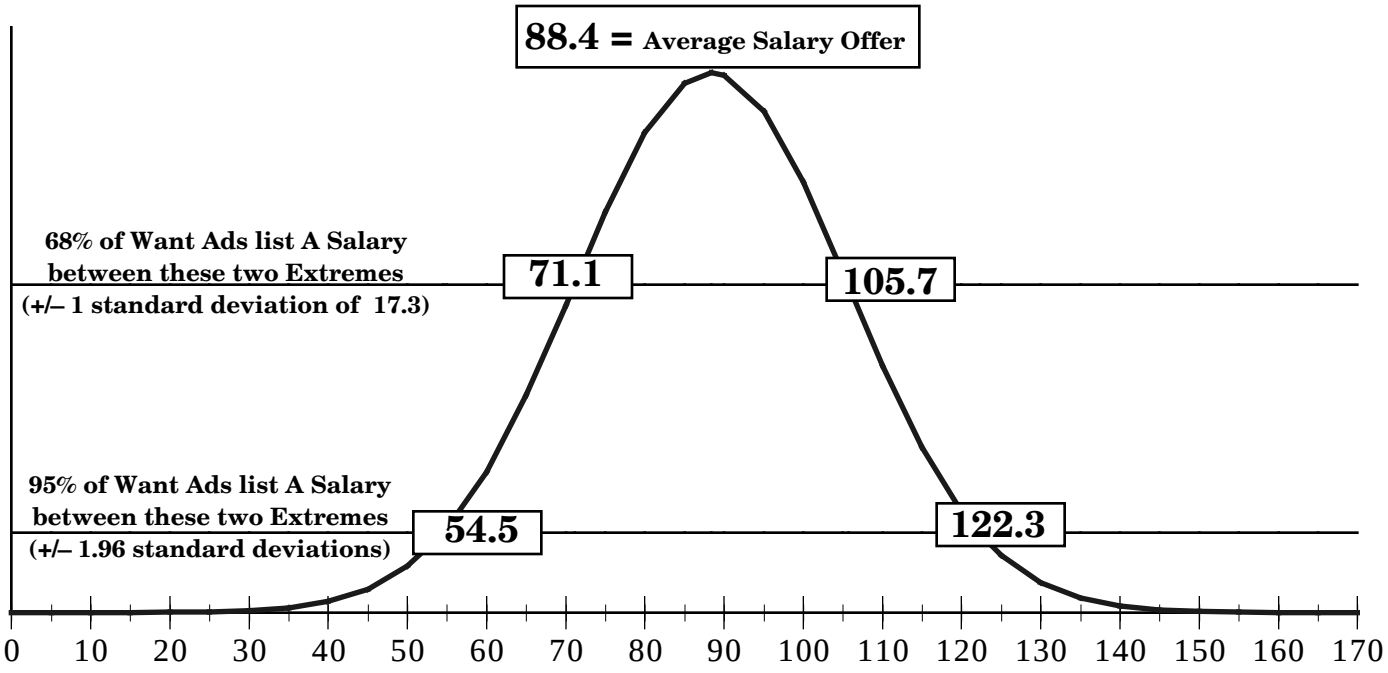
- Translates user requirements into design specifications for a new application, or, to reengineer and enhance existing applications
- Codes application modules based on a design document
- Integrates, Tests, Debugs and Implements application modules and documents the results

# Financial C++ Programmer
# Sample Averages and Distributions

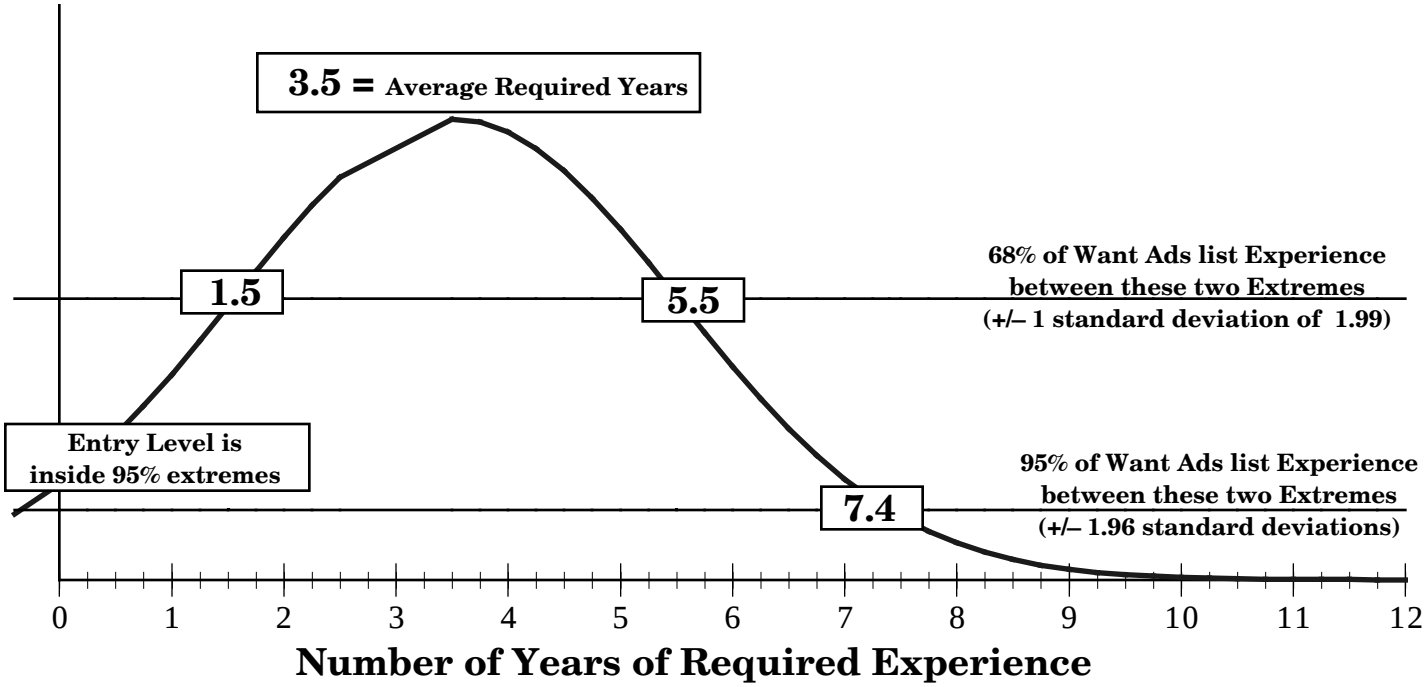
**Sample Size: 57 Want Ads**

**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



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# The Equation of the Expected Salary Offer

Salary offers are lowest at entry level, increase rapidly with the first years of experience and approach a ceiling as experience matures.

| | | Entry Level | | Year of Experience<br>Dollars per Year<br>Multiplied by<br>Natural Logarithm of Number of Years + 1 for entry level |
|---|---|---|---|---|
| **Expected Salary Offer** | **=** | **$55.7** | **+** | **$23.0 ln(Years + 1)** |
| **First 95% Confidence Bound of Expected Salary Offer** | **=** | **$68.7** | **+** | **$14.2 ln(Years + 1)** |
| **Second 95% Confidence Bound of Expected Salary Offer** | **=** | **$42.7** | **+** | **$31.8 ln(Years + 1)** |

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.

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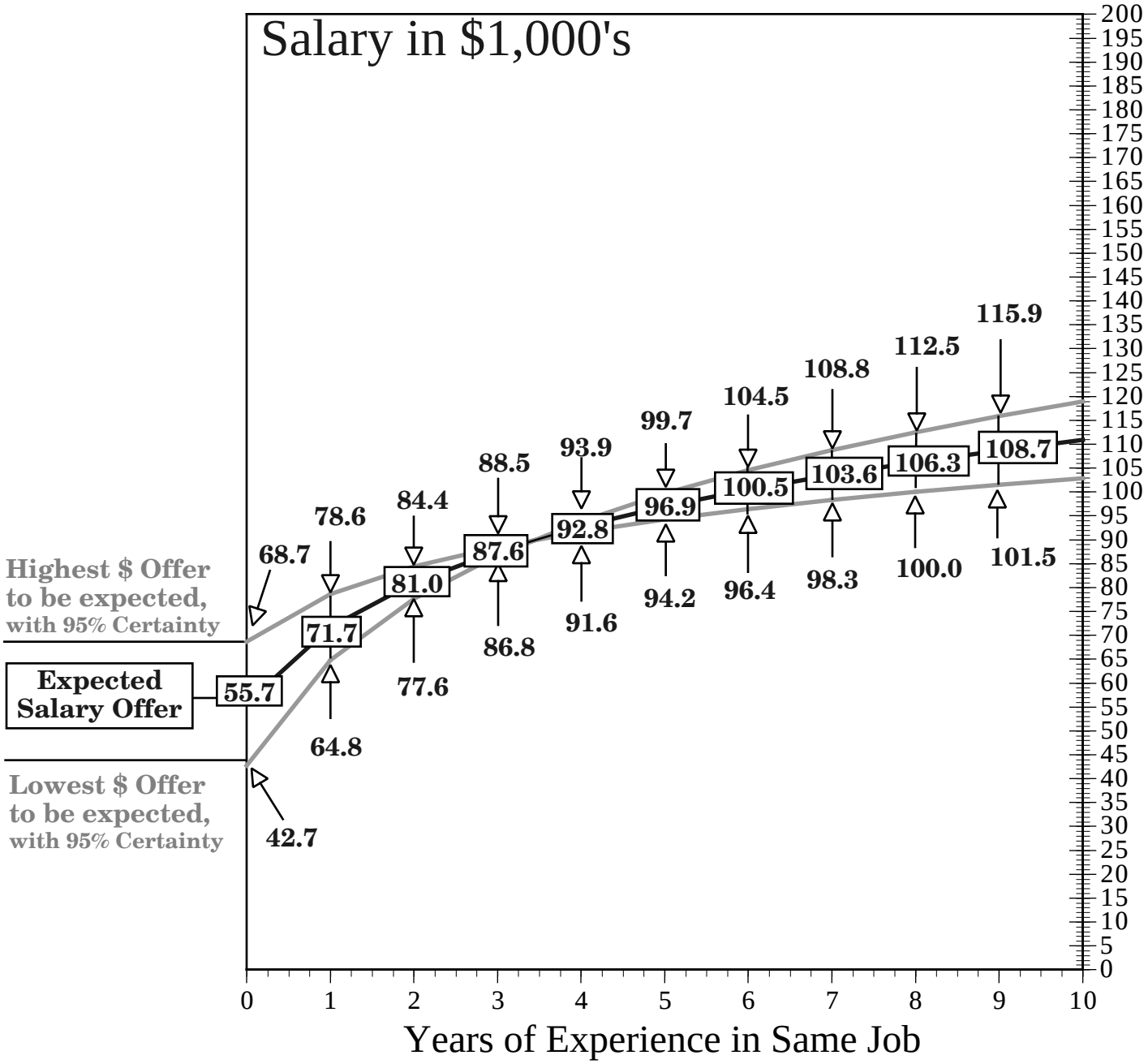
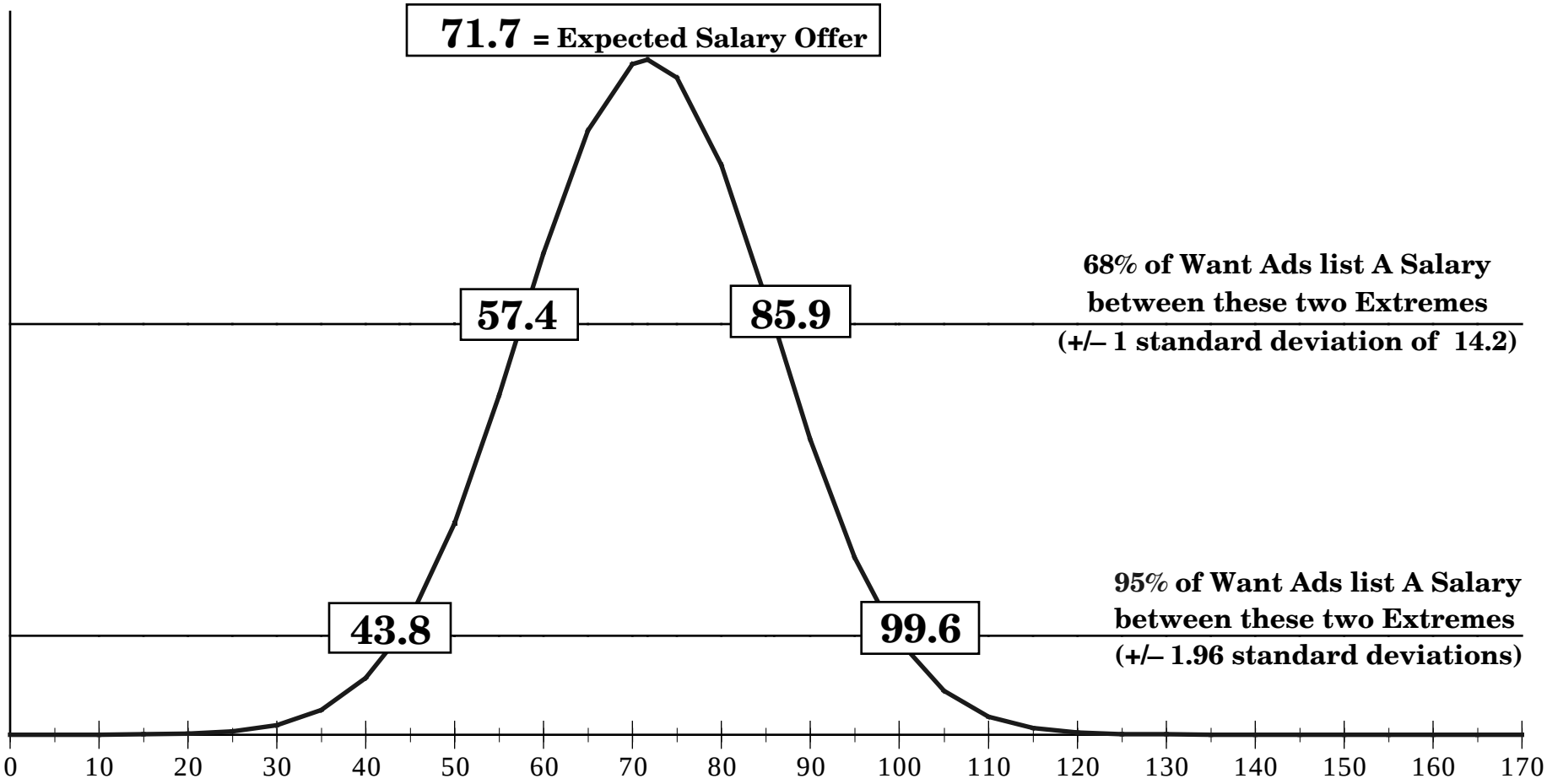
The Expected Salary Offer
& its 95% Probability Range
for Each Year of Required Experience




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

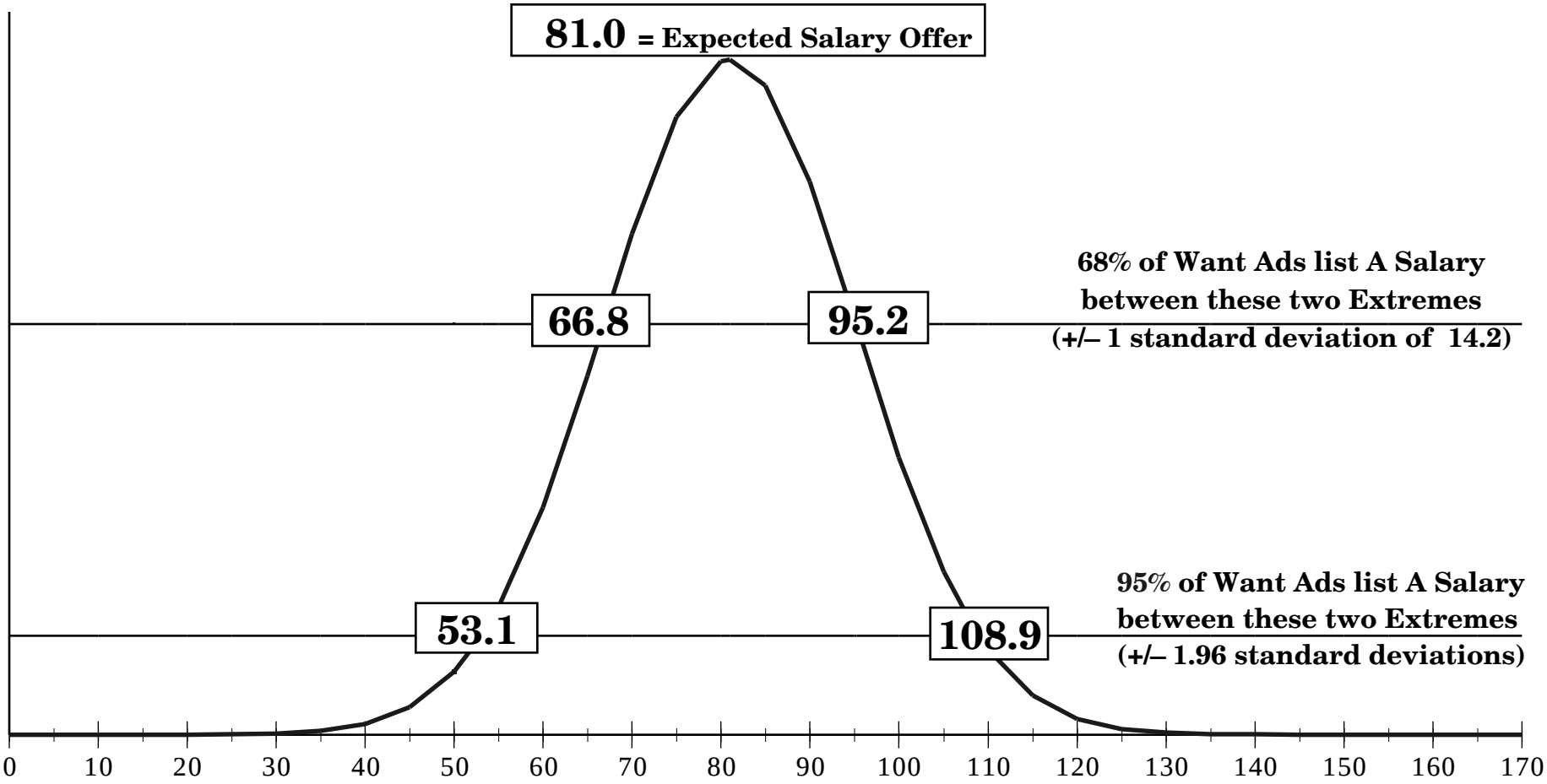
# Financial C++ Programmer
# Extreme Salary Offers: 1 Year of Required Experience




## Salary in $1,000's

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

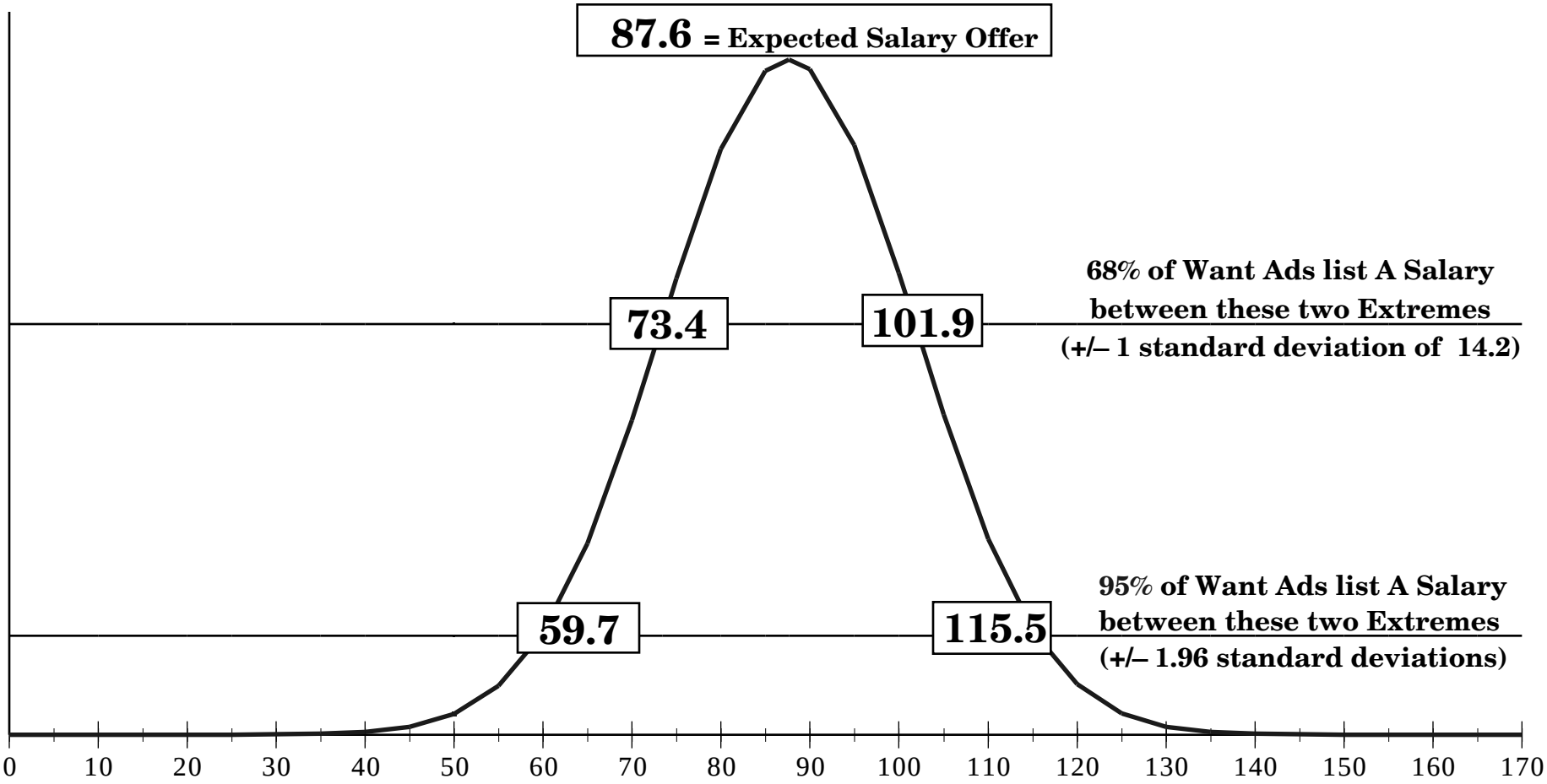
# Financial C++ Programmer
# Extreme Salary Offers: 2 Years of Required Experience




## Salary in $1,000's

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

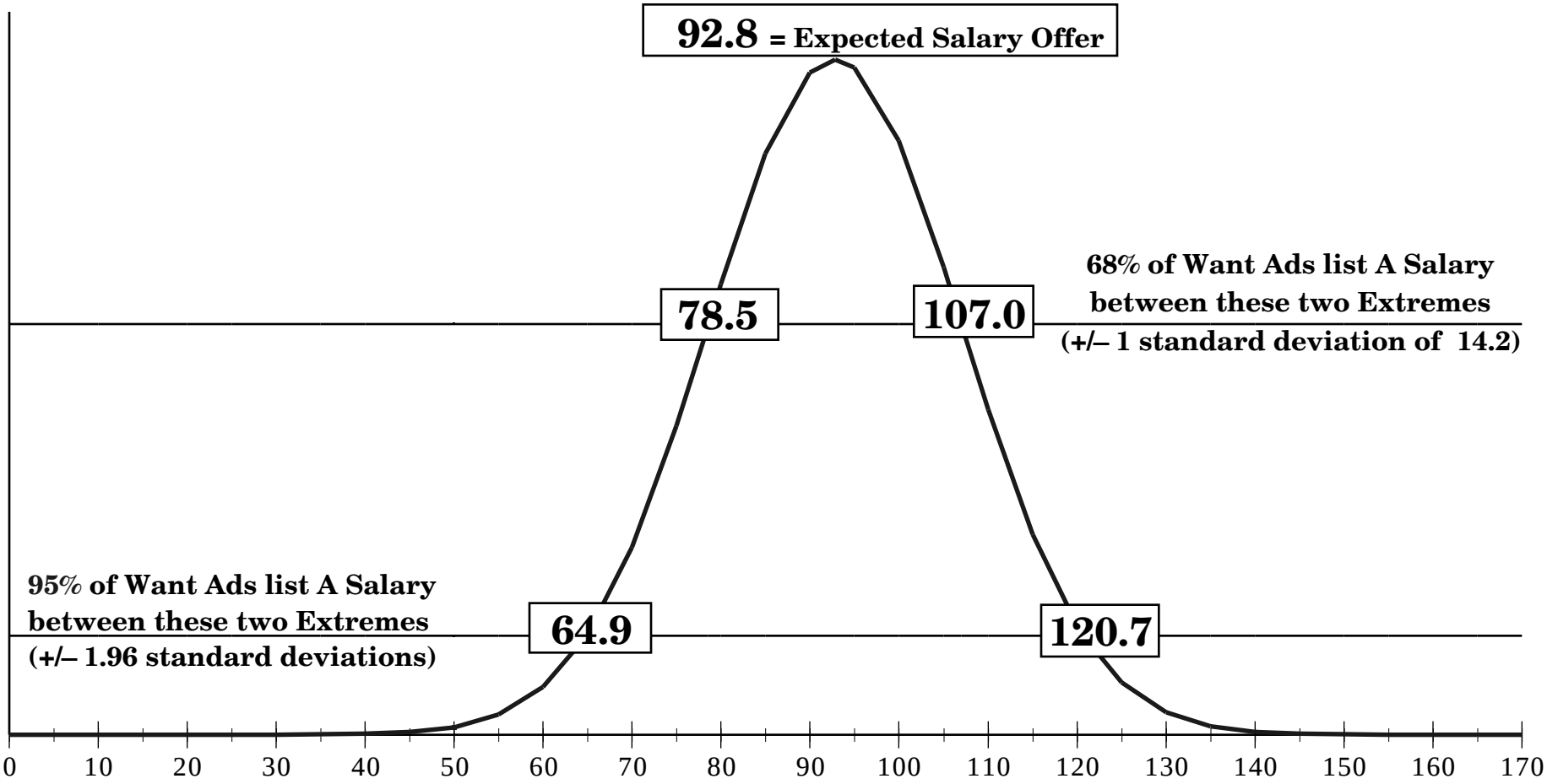
# Financial C++ Programmer
# Extreme Salary Offers: 3 Years of Required Experience




## Salary in $1,000's

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

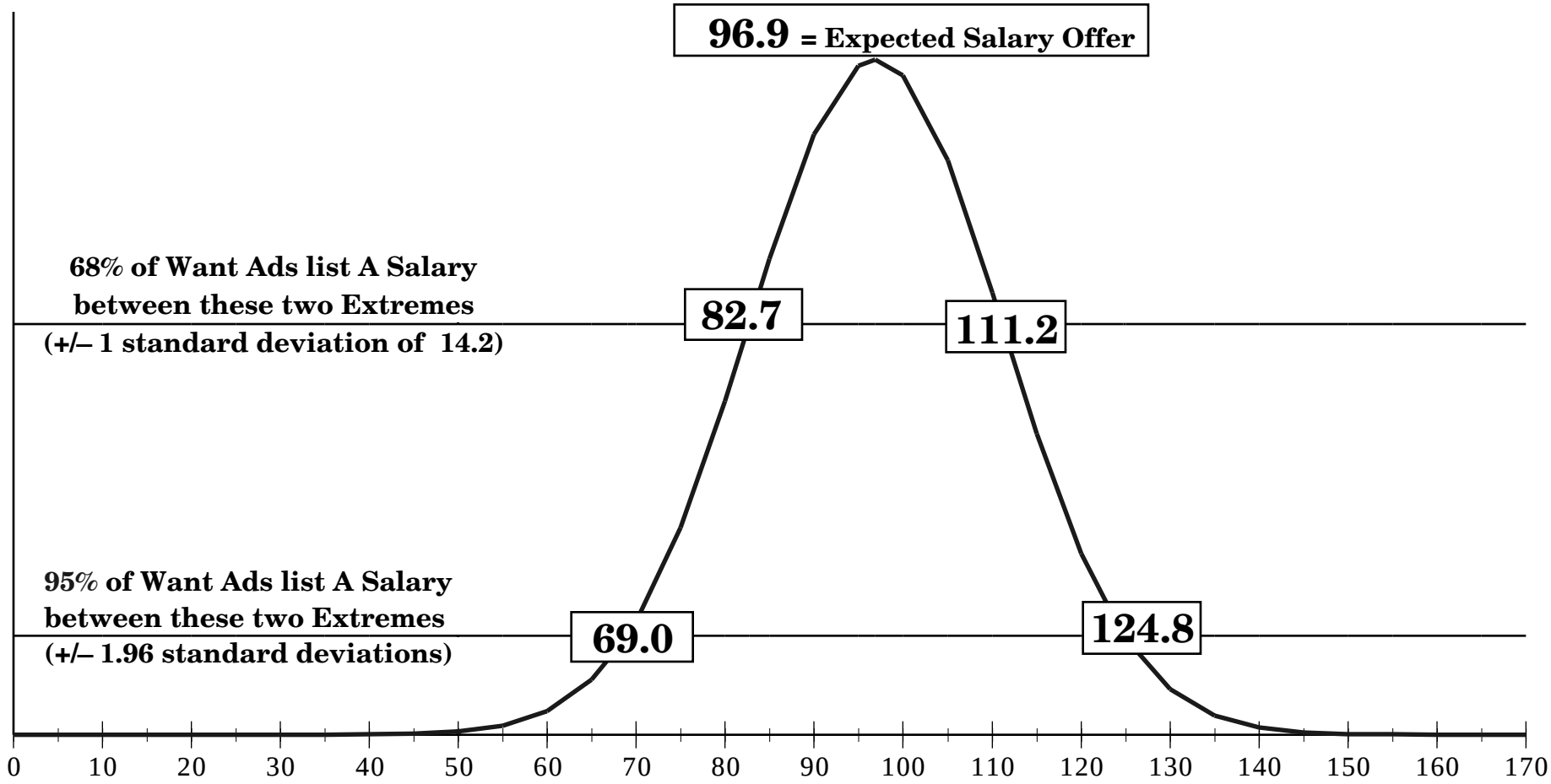
# Financial C++ Programmer
# Extreme Salary Offers: 4 Years of Required Experience




## Salary in $1,000's

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

# Financial C++ Programmer
# Extreme Salary Offers: 5 Years of Required Experience




## Salary in $1,000's

**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.

# Financial C++ Programmer
# Statistical Test Results

Regression Summary
Salary vs. ln(Years+1)

| | |
|---|---|
| Count | 57 |
| Num. Missing | 0 |
| R | .579 |
| R Squared | .335 |
| Adjusted R Squared | .323 |
| RMS Residual | 14.234 |

The R Squared statistic indicates:
1. 33.5% of the variability between salaries offered in want ads is explained by the expected salary offer line.
2. 66.5% of the variability between salaries offered in want ads is explained in the areas above and below the average salary offer line. This variability 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 vs. ln(Years+1)

| | DF | Sum of Squares | Mean Square | F-Value | P-Value |
|---|---|---|---|---|---|
| Regression | 1 | 5616.633 | 5616.633 | 27.721 | <.0001 |
| Residual | 55 | 11143.876 | 202.616 | | |
| Total | 56 | 16760.510 | | | |

Regression Coefficients
Salary vs. ln(Years+1)

| | Coefficient | Std. Error | Std. Coeff. | t-Value | P-Value |
|---|---|---|---|---|---|
| Intercept | 55.727 | 6.479 | 55.727 | 8.601 | <.0001 |
| ln(Years+1) | 23.006 | 4.370 | .579 | 5.265 | <.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 (Intercept 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 ( ln(Years+1) P-Value in Regression Coefficients Table).