Page No.
Date: / /

Assignment 11

- Title: Mean, Variance & Standard deviation
- Problem Statement:
  Write 80387 ALP to obtain
  1) Mean 2) Variance 3) Standard deviation
  Also plot histogram of the dataset
  Data is in text file.
- Objective:
  To implement 80387 ALP to find solutions to mathematical problems.
- Outcome:
  I will be able to implement 80387 ALP to find mean, variance, standard deviation of given data.
- Requirements:
  1) Core 2duo / i3 / i5 / i7
  2) Linux 32/64 bit
  3) gedit / vi
  4) NASM
  5) GDB

- Theory:

Mean : $\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$

Variance : $\sigma_x^2 = \frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n}$

Standard deviation : $\sigma_x = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n}}$

There are n discrete observations
$x_1, x_2, x_3 \ldots x_n$

- Algorithm:

1) Store elements in an array
2) Find sum of all elements in array.
3) Divide sum by n
4) Store result in [mean]
5) Find sum of $(x_i - \bar{x})^2$ for all x_i in the array
6) Divide sum by n.
7) Store result in [var]
8) Find sequential root of [var]
9) Store result in [sd]
10) Print [mean], [var], [sd] using procedure.

Page No.
Date: / /

procedure printresult:

1) Load given memory location on stack
2) Multiply by 100.
3) Pop result in [result]
4) Convert result to ASCII format
5) Print first 16 bytes of result
6) Print '.' symbol
7) Print last two bytes of result
8) Return.

- Test Cases:

Input	Expected o/p	Actual o/p
11.50, 21.10	M = 20.21	
13.47, 17.34	V = 87.28	Yes
31.47	SD = 9.34	

- Conclusion:
ALP for calculating mean, variance, SD of given data is implemented using 80387.