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### ***Predicting Responses***

#### **OBJECTIVE FOR THIS LAB:**

- This lab explores predicting system responses with multi-factor regression models using the CPU DB database.

#### **Part 1:**

- The data in the table will represent the values as follow:

$$\text{mean} \pm (95\% \text{ confidence interval})$$
$$f = 0.6$$

	<b>Int1992</b>	<b>Int2000</b>	<b>Int2006</b>	<b>Fp2000</b>	<b>Fp2006</b>
<b>Int1992</b>	-0.226 ± 5.211 (not statistically significant)	850.31 ± 850.31	1938.1 ± 1938.1	1408.3 ± 1408.3	2271.5 ± 2271.5
<b>Int2000</b>		2.728 ± 4.291 (not statistically significant)	50.910 ± 50.910	0.168 ± 2.154 (not statistically significant)	
<b>Int2006</b>			-0.128 ± 0.532 (not statistically insignificant)		-17.25 ± 17.25
<b>Fp1995</b>				-113.4 ± 113.4	
<b>Fp2006</b>					0.743 ± 3.389 (not statistically significant)

## Part 2:

- **What can you say about the models' predictive abilities, based on these results?**

we can say that the adjusted predictive abilities hold pretty well. All of the adjusted predictive shows no statistically significant results with mean they describe the data of the their set pretty well. On the other hand, the adjusted predictive do not describe different generation exactly which is expected to be the case be the case.

- **How well does a model developed from the integer (Int) benchmark results predict the performance of the integer and floating-point (Fp) benchmarks from the same year?**

Surprisingly, the results of INT-FP from the same year does not have a major difference in the confidence interval. Not as much as the difference of INT-FP of different generations. In some cases, INT-FP from the same year has no statically significant different as in the year of 2000. The predictions were really good because they are scattered around zero as well as the confidence interval is relatively small which indicate higher precision. The distribution seems to follow Gaussian Distribution which means the error are mostly due to system error. After going through training, we can say that the predictions are not perfect, but they are good-enough for most data collection applications.

- **What about predictions from one generation to another generation?**

The predictions from one generation to another are saying generation after generation the processor are becoming substantially better and better which indicated by the mean shifted massively to the positive side of the interval. The confident interval does not cover the value zero which means the difference between old generation processor and new generation processor is statistically significant.

- **Any other interesting results you see?**

An interesting observation from the table would be INT2000 and FP2000 processors. Even though they are completely different types INT2000 when compared with FP2000 using adjusted predictive ended up no statistically significant in their results. Thus, This can implies that the created regression model for INT2000 can somewhat fits FP200 to some degree and vice versa.

Another interesting observation is the increasingly shift of mean value to the positive direction as times goes by which is expected as the development of processor follows Moore's Law where processors double in complexity every two years which leads to double the performance.