**‘AccessBank DBA Internship Program’**

**Project 17: Monitoring SQL Server for performance issues**

Sitting down with the IT director, he has asked you to give a brief introduction to the system of performance tuning. He wants you to talk about, explain and demonstrate the key points, common counters, and the method for configuring the perfmon tool.

He want specifically for you to concentrate in answering the following:

* What is the reason to use the windows perfmon tool for SQL Server Analysis?

**We need to monitor some common performance metrics or counters to see everything is alright and running smoothly if there are some deviations from the baseline (metrics’ normal range) we need to do something to resolve or understand what’s the problem and fix it if I can or report it to developer or vendor.**

* What common counters should you monitor?

**Memory\**Available MBytes

**Memory\**Pages/sec

**Memory\**Page faults/sec

**PhysicalDisk(\_Total)\**Disk transfers/sec

**PhysicalDisk(\_Total)\**Disk Bytes/sec

**PhysicalDisk(\_Total)\**Avg. Disk Read Queue Length

**Processor(\_Total)\**%Processor Time

**Processor(\_Total)\**%privileged

**SQLServer:Buffer Manager\**Buffer cache hit ratio

**SQLServer:Buffer Manager\**Page life expectancy

**SQLServer:SQL Statistics\**SQL Compilations/sec

**SQLServer:SQL Statistics\**SQL Re-Compilations/sec

**Network Interface\**Bytes Sent/sec

**Network Interface\**Bytes Received/sec

* What specific common counters should you monitor for CPU, memory, and disks?

**For CPU:** Processor time and % privileged

**For memory:** Pages/sec and Page faults/sec

**For disk(physical disk):** % disk time, avg. disk queue length, disk transfers/sec, disk bytes/sec and etc.

* What are the expected approx. thresholds for each counter that causes spikes?

**% Processor time** - **>80%**

**% privileged** - **>10%**

**Available MBytes** - **<500MB**

**Pages/sec** - **>50**

**Page faults/sec** - **>baseline number**

**Buffer cache hit ratio** - **<90%**

**% disk time** - **>85%**

**Avg. Disk Queue Length** - **>2 per core**

**Disk transfers/sec - >400 per disk**

**Disk Bytes/sec -** **>800MB**

**%net Utilization** - **>75 or 80%**

* What are some of the resolutions?

**For CPU counters, we can add more processors or use faster processors. For memory related counters, giving memory to SQL Server, enable data compression, use 64-bit system and processor. For disk related problems, use SSD rather than HDD, try to eliminate contention, add RAM, spread out database objects so we can reach out them simultaneously and reduce contention. But before all doing these try to fix software side like try to optimize application or use indexing to optimize queries and increase performance because hardware can be much expensive so we need to first fix it from software side.**