CSC 3320

Project A2

Team Raspberry

**Task Parallel Programming Skills:**

**Foundation**

1. The components on the raspberry PI B+ are as follows:
2. 1 GB RAM
3. 100 base Ethernet
4. Has port for an Ethernet cable
5. HDMI video output
6. MIPI CSI camera port
7. 64-bit Broadcom BCM2837B0, Quad core A53 (Arm v8)
8. Micro SD card slot
9. 4 \* USB 2.0 Port
10. Wireless card for network and Bluetooth connection
11. 4 core CPU that have the clock speed of 1.2 GHZ with 64-bit architecture
12. The Raspberry Pi’s B+ CPU have 4 CPU cores.

|  |  |
| --- | --- |
| **X86(CISC)** | **ARM(RISC)** |
| It is useful for fully developed computers | It is beneficial for small devices like tablets, phones and raspberry pi |
| It takes multiple clock cycles on a CPU to run an instruction, which means each instruction put more load on the CPU. | It takes an average of one clock cycles on CPU to run an instruction which means each instruction puts less of load on the CPU. |
| It has a memory unit which build the complex instructions | It has no memory unit, when implementing the instruction, it uses a separate hardware. |

|  |  |
| --- | --- |
| **Sequential** | **Parallel** |
| Are uniprocessor systems | Are multiprocessor System |
| Can execute one instruction at a time | Can execute several instructions at a time |
| Speed is limited | No limitation in speed |

1. Data parallelism breaks up the data that the program controls on over several cores and task parallelism breaks up the task of the program over several corers.

|  |  |
| --- | --- |
| **Processes** | **Threads** |
| An instance of a computer program that is being executed | A component of a process which have the smallest execution unit |
| Each process executes by itself | It can assist another thread to read, write or modify the data. |
| Heavyweight tasks | Lightweight tasks |

1. OpenMP is a source of a library that writes the parallel programs. OpenMP progmas supply the ability to an optimizing compiler manually.
2. The benefit from multi- core are as follows:
3. Amazon web services
4. Any web server that multiple incoming request.
5. Large data processing
6. Backend of banking APP which have the higher requests.
7. There are various benefits form multi-core for application some of them are :
8. Clock speeds : multi-core helps to enhance the performance level.
9. High performance computing breaks the problems into pieces and solve it.
10. Virtualization of memory: Multi-core helps to increase in channels which allows the large blocks of data to execute and analyze.
11. Databases and the cloud : Muti-core assist to multiple databases effective in a single server.