**CATATAN DEBUGING AND TECHNIQUES (COURSERA)**

|  |  |  |
| --- | --- | --- |
| **Debugging** | **VS** | **Techniques** |
| * Identifying, Analyzing, and Remove bug * In the actual program code |  | * Identifying, Analyzing of the problem * In the running application |

**3 Main Steps to Solve the Problem**

1. **Getting info / Gather info**

Reproduction case, use any document, ask friends or community

1. **Finding the root cause**

What triggered the problem.

To find the root cause problem :

1. Look all available logs
2. Figure out what changed
3. Trace the system / library calls the program
4. Create small possible reproduction
5. **Solution**

Give short or long term solution

**Possible Causes of Slowness**

*“If computer become sluggish after days run just fine, and the problem goes away with reboot*

*It means there’s program keep some state while run”*

**Speed Time of Running Program Application**

*“When application access data, the speed time to run a program depends on where the data is located”*

**Description :**

* If variable is being used in function, data stored in CPU Internal Memory
* If variable is in program, but not in being used, data stored in RAM
* If data in file, program needs more time to read from the disk. Because program needs to parsing the file.

**Note :**

*Read data from disk slower than read from RAM*

**How to Avoid Expensive Act**

*“Expensive act is those that can take a long time to complete”*

1. Avoid parsing file
2. Avoid download data over the network
3. Avoid going through a long list
4. Create a local cache
5. Check if the a line code program is needed
6. Do the parallel operation. *Parallel operation = divide the tasks to get the same result in shorter time.*

**Some tips while doing parallel operation**

1. Needs to understand what the operating system (OS) already done for us
2. Easy way to run operation in parallel is to split them across different processes
3. Have 2 good balance of different workloads that run on computer

**If there’s error when you run the application, but can’t edit the program. What to do?**

1. **Use wrapper**. *Wrapper is function or program that provides compatibility layer between 2 function / program, so they can work together*
2. **Do the watchdog**. *Watchdog is the process to check if the program is running. When it’s not, it automatically start program / application again.*
3. **Use container**. *Container allows app to run on its own environment without interfering the operating system (OS)*

**Memory Leak Prevention**

1. Use garbage collector tools. Garbage collector in charge of freeing memory that’s no longer in use.
2. Use memory profiler to figure out how memory is being used. Ex : Valgrind for C & C++
3. Managing disk space

Note :

If data stored in logs or temporary file, something gone wrong.

**Network Saturation**

*“2 factors to determine the time it takes to get data over network are (1) latency, and (2) bandwith of connection”*

*“Low bandwith =+ Latency”*

Description :

1. Latency

Delay between sending data and receive it on the other side

1. Bandwith

How much data can be sent in seconds

**GLOSARIUM**

aa