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## Q1 Screenshot

Below is “help”, “host”, “host <hname> info”, “host <hname> datastore”, “host <hname> info” and invalid input stdout.

```
ca. Command Prompt - java -jar vmtest.jar 130.65.159.14 cmpe281_sec3_student@vsphere.loc... - □ X
Microsoft Windows [Version 10.0.10586]
(c) 2015 Microsoft Corporation. All rights reserved.

C:\Users\Fei>cd workspace\vmtest\out\artifacts\vmtest_jar

C:\Users\Fei\workspace\vmtest\out\artifacts\vmtest_jar>java -jar vmtest.jar 130.
65.159.14 cmpe281_sec3_student@vsphere.local cmpe-LXKN
CMPE281 HW2 from Mengxuan Cai
mengxuan-444> help
exit                exit the program
host                enumerate hosts
host hname info     show info for hname
host hname datastore enumerate datastores for hname
host hname network  enumerate networks for hname
vm                 enumerate vms
vm vname info       show info for vname
vm vname shutdown   shutdown OS on vname
vm vname on         power on vname
vm vname off        power off vname

mengxuan-444> host
host[0]: Name = 130.65.159.10
host[1]: Name = 130.65.159.11
host[2]: Name = 130.65.159.18
host[3]: Name = 130.65.159.19
host[4]: Name = 130.65.159.20

mengxuan-444> host 130.65.159.11
Warning: Command not correct! Check command help.

mengxuan-444> host 130.65.159.11 info
Host:
    Name = 130.65.159.11
    ProductFullName = VMware ESXi 5.5.0 build-1623387
    Cpu cores = 24
    RAM = 255 GB

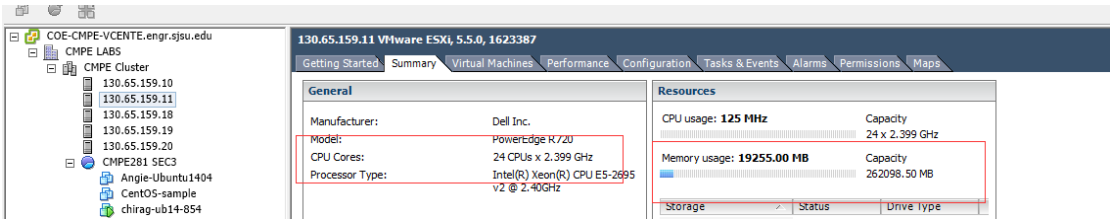
mengxuan-444> host 130.65.159.11 datastore
Host:
    Name = 130.65.159.11
    Datastore[0]: name = Classroom, capacity = 5119 GB, FreeSpace = 3714 G
B.

mengxuan-444> host 130.65.159.11 network
Host:
    Name = 130.65.159.11
    Network[0]: name = VM Network

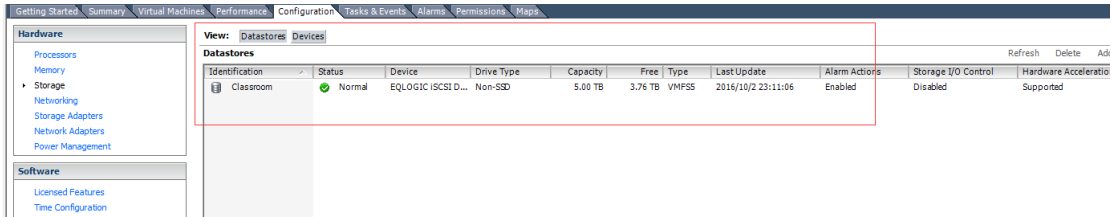
mengxuan-444> host abc info
Failed: Invalid host name = abc

mengxuan-444>
```

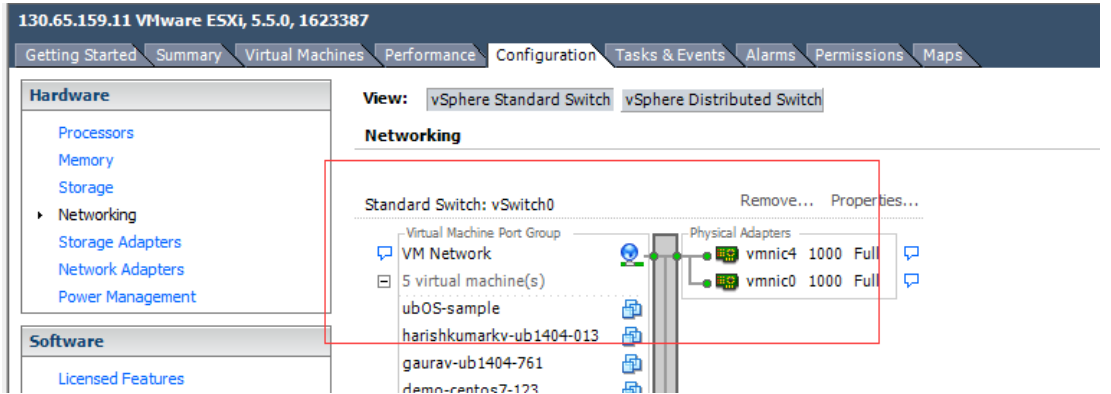
Blow is the info of the host on VMware Vsphere Client(for comparison):  
Cpu & Memory:



DataStore:



Networks:



## Q2 Screen shot:

Below is “vm”, “vm <my\_vname> info”, “vm <my\_vname> off”, “vm <my\_vname> on”, “vm <my\_vname> shutdown”, “vm <my\_vname> off” command stdout.

```
Command Prompt - java -jar vmtest.jar 130.65.159.14 cmpe281_sec3_student@vsphere.loc...
mengxuan-444> vm
vm[0]: Name = ub1404-template-do_not_delete
vm[1]: Name = centos7-template-do_not_delete
vm[2]: Name = ankil-ub1404-703
vm[3]: Name = demo-ub1404-arun-768
vm[4]: Name = chirag-ub14-854
vm[5]: Name = DanhuaYang-ub1404-681
vm[6]: Name = dibao_ub1404_317
vm[7]: Name = Ekta-ub14-421
vm[8]: Name = HanpingLin_ub1404_743
vm[9]: Name = HuiWan-ub1404-716
vm[10]: Name = Huiyu-Centos7-095-01
vm[11]: Name = Huiyu-Ubuntu1404-095-1
vm[12]: Name = Jay-UB1404-470
vm[13]: Name = jihenglub1404-239
vm[14]: Name = Jing-ub1404-271
vm[15]: Name = MandeepKaur-ub1404-969
vm[16]: Name = Manthan-ubuntu1404-448
vm[17]: Name = mengxuan-ub1404-444
vm[18]: Name = Miao_Wang_centos7_202
vm[19]: Name = MukulBajpai_ub1404_449
vm[20]: Name = nischith-ub1404-430
vm[21]: Name = Pavanteja_ub14_524
vm[22]: Name = pratik-ub1404-021
vm[23]: Name = CentOS-sample
vm[24]: Name = ubOS-sample
vm[25]: Name = renubatheja-ub1404-300
vm[26]: Name = saurabh-ub1404-344
vm[27]: Name = Sheng-ub1404-677
vm[28]: Name = Sheng-centos7-677
vm[29]: Name = snehakamath-ub1404-798
vm[30]: Name = Sneha_ubuntu_vm
vm[31]: Name = snehakamath-centos7-798
vm[32]: Name = SterlingTarg-ub1404-221
vm[33]: Name = sucheta-ub1404-486
vm[34]: Name = Suriya_Shankar _136
vm[35]: Name = TingtingWang-ub1404-884
vm[36]: Name = XiaoyuZhou-ub1404-038
vm[37]: Name = Yue-Centos7-280
vm[38]: Name = Yue-Ubuntu1404-280
vm[39]: Name = Darshil-Ubuntu1404-321
vm[40]: Name = demo-centos7-123
vm[41]: Name = demo-ub1404-123
vm[42]: Name = gaurav-ub1404-761
vm[43]: Name = harishkumarkv-ub1404-013
vm[44]: Name = praneethareddy_ub1404_656
vm[45]: Name = pratik-ub1404-256
vm[46]: Name = sreekar_maram_108

mengxuan-444> vm mengxuan-ub1404-444 info
Virtual Machine:
  Name = mengxuan-ub1404-444
  Guest full name = Ubuntu Linux (64-bit)
  Guest state = toolsOk
  Ip addr = 130.65.159.130
  Tool running status = guestToolsRunning
  Power status = poweredOn
```

```

vm[46]: Name = sreekar_maram_108

mengxuan-444> vm mengxuan-ub1404-444 info
Virtual Machine:
  Name = mengxuan-ub1404-444
  Guest full name = Ubuntu Linux (64-bit)
  Guest state = toolsOk
  Ip addr = 130.65.159.130
  Tool running status = guestToolsRunning
  Power status = poweredOn

mengxuan-444>

mengxuan-444> vm mengxuan-ub1404-444 off
Virtual Machine:
  Name = mengxuan-ub1404-444
Power off VM: status = success, completion time = 07/10/2016 20:31:17

mengxuan-444> vm mengxuan-ub1404-444 on
Virtual Machine:
  Name = mengxuan-ub1404-444
Power on VM: status = success, completion time = 07/10/2016 20:31:25

mengxuan-444> vm mengxuan-ub1404-444 shutdown
Virtual Machine:
  Name = mengxuan-ub1404-444
Shutdown guest: completed, time = 07/10/2016 20:32:18

mengxuan-444> vm mengxuan-ub1404-444 off
Virtual Machine:
  Name = mengxuan-ub1404-444
Power off VM: status = The attempted operation cannot be performed in the current state (Powered off)!, completion time = 07/10/2016 20:33:18

mengxuan-444>

```

Below is the my vm info on Vmware Vsphere client:

The screenshot shows the VMware vSphere client interface for a virtual machine named 'mengxuan-ub1404-444'. The 'General' tab is selected, displaying the following information:

- Guest OS:** Ubuntu Linux (64-bit)
- VM Version:** vmx-10
- CPU:** 2 vCPU
- Memory:** 3072 MB
- Memory Overhead:** 41.18 MB
- VMware Tools:** Running (Current)
- IP Addresses:** 130.65.159.130
- DNS Name:** ub1404desktop
- EVC Mode:** Intel® "Nehalem" Generation
- State:** Powered On
- Host:** 130.65.159.10
- Active Tasks:** 0
- Record/Replay Status:** Off
- vSphere HA Protection:** N/A

The 'Resources' tab shows the following resource usage:

- Consumed Host CPU:** 0 MHz
- Consumed Host Memory:** 522.00 MB
- Active Guest Memory:** 2304.00 MB
- Provisioned Storage:** 53.11 GB
- Not-shared Storage:** 8.93 GB
- Used Storage:** 8.93 GB

The 'Storage' section shows a single disk named 'Classroom' with a status of 'Normal' and a drive type of 'Non-SSD'. The 'Network' section shows a single network adapter named 'VM Network' with a type of 'Standard port group' and a status of 'Connected'.

Below is my vm task and event:

mengxuan-ub1404-444									
Getting Started Summary Resource Allocation Performance Tasks & Events Alarms Console Permissions Maps Storage Views									
View: Tasks Events									
Name	Target	Status	Details	Initiated by	vCenter Server	Requested Start Time	Start Time	Completed Time	
Power On virtual machine	mengxuan-ub1404-444	Completed		System	COE-CMPE-VC...	2016/10/7 20:45:53	2016/10/7 20:45:53	2016/10/7 20:45:56	
Power Off virtual machine	mengxuan-ub1404-444	Completed		VSPHERELO...	COE-CMPE-VC...	2016/10/7 20:45:48	2016/10/7 20:45:48	2016/10/7 20:45:50	
Power On virtual machine	mengxuan-ub1404-444	Completed		System	COE-CMPE-VC...	2016/10/7 20:37:18	2016/10/7 20:37:18	2016/10/7 20:37:22	
Power Off virtual machine	mengxuan-ub1404-444	Completed		VSPHERELO...	COE-CMPE-VC...	2016/10/7 20:36:34	2016/10/7 20:36:34	2016/10/7 20:36:35	
Power On virtual machine	mengxuan-ub1404-444	Completed		System	COE-CMPE-VC...	2016/10/7 20:35:48	2016/10/7 20:35:48	2016/10/7 20:35:51	
Power Off virtual machine	mengxuan-ub1404-444	The attempted operation cannot be performed in the current state (Powered off)		VSPHERELO...	COE-CMPE-VC...	2016/10/7 20:33:18	2016/10/7 20:33:18	2016/10/7 20:33:18	
Initiate guest OS shutdown	mengxuan-ub1404-444	Completed		VSPHERELO...	COE-CMPE-VC...	2016/10/7 20:32:06	2016/10/7 20:32:06	2016/10/7 20:32:06	
Power On virtual machine	mengxuan-ub1404-444	Completed		VSPHERELO...	COE-CMPE-VC...	2016/10/7 20:31:22	2016/10/7 20:31:22	2016/10/7 20:31:25	
Power Off virtual machine	mengxuan-ub1404-444	Completed		VSPHERELO...	COE-CMPE-VC...	2016/10/7 20:31:15	2016/10/7 20:31:15	2016/10/7 20:31:17	
Power On virtual machine	mengxuan-ub1404-444	Completed		VSPHERELO...	COE-CMPE-VC...	2016/10/7 20:28:22	2016/10/7 20:28:22	2016/10/7 20:28:25	
Power Off virtual machine	mengxuan-ub1404-444	The attempted operation cannot be performed in the current state (Powered off)		VSPHERELO...	COE-CMPE-VC...	2016/10/7 20:21:25	2016/10/7 20:21:25	2016/10/7 20:21:25	

View: Tasks Events

Description	Type	Date Time	Task	Target	User
Resource allocation changed	info	2016/10/9 21:43:40		mengxuan...	
Alarm 'Virtual machine memory usage' changed from Gray to Green	info	2016/10/9 21:42:47		mengxuan...	
Alarm 'Virtual machine CPU usage' changed from Gray to Green	info	2016/10/9 21:42:47		mengxuan...	
A ticket of type mks has been acquired.	info	2016/10/9 21:41:51		mengxuan...	VSPHERE.LOCAL\c...
DRS powered On the virtual machine on 130.65.159.10	info	2016/10/9 21:41:43	Power On virtual machine	mengxuan...	
Resource allocation changed	info	2016/10/9 21:41:43		mengxuan...	
Virtual machine is starting	info	2016/10/9 21:41:40	Power On virtual machine	mengxuan...	
Task: Power On virtual machine	info	2016/10/9 21:41:40	Power On virtual machine	mengxuan...	
Alarm 'Virtual machine memory usage' changed from Green to Gray	info	2016/10/9 21:40:56		mengxuan...	
Alarm 'Virtual machine CPU usage' changed from Green to Gray	info	2016/10/9 21:40:56		mengxuan...	
Virtual machine on 130.65.159.10 is powered off	info	2016/10/9 21:40:56	Power Off virtual machine	mengxuan...	VSPHERE.LOCAL\c...
Resource allocation changed	info	2016/10/9 21:40:55		mengxuan...	
Virtual machine is stopping	info	2016/10/9 21:40:54	Power Off virtual machine	mengxuan...	VSPHERE.LOCAL\c...
Task: Power Off virtual machine	info	2016/10/9 21:40:54	Power Off virtual machine	mengxuan...	VSPHERE.LOCAL\c...
Cannot shut down the guest OS. Cannot complete operation because VMware Tools is not running in this virtual machine.	error	2016/10/9 21:40:12	Initiate guest OS shutdown	mengxuan...	VSPHERE.LOCAL\c...
Guest OS shut down	info	2016/10/9 21:40:12	Initiate guest OS shutdown	mengxuan...	VSPHERE.LOCAL\c...
Task: Initiate guest OS shutdown	info	2016/10/9 21:40:12	Initiate guest OS shutdown	mengxuan...	VSPHERE.LOCAL\c...
Task: Power On virtual machine	info	2016/10/9 21:39:51	Power On virtual machine	mengxuan...	VSPHERE.LOCAL\c...
A ticket of type mks has been acquired.	info	2016/10/7 23:19:19		mengxuan...	VSPHERE.LOCAL\c...
Alarm 'Virtual machine memory usage' changed from Gray to Green	info	2016/10/7 20:47:03		mengxuan...	
Alarm 'Virtual machine CPU usage' changed from Gray to Green	info	2016/10/7 20:47:03		mengxuan...	
Resource allocation changed	info	2016/10/7 20:46:20		mengxuan...	
DRS powered On the virtual machine on 130.65.159.10	info	2016/10/7 20:45:56	Power On virtual machine	mengxuan...	
Resource allocation changed	info	2016/10/7 20:45:55		mengxuan...	
Virtual machine is starting	info	2016/10/7 20:45:53	Power On virtual machine	mengxuan...	
Task: Power On virtual machine	info	2016/10/7 20:45:53	Power On virtual machine	mengxuan...	
Alarm 'Virtual machine memory usage' changed	info	2016/10/7 20:45:50		mengxuan...	

### Q3 screenshot

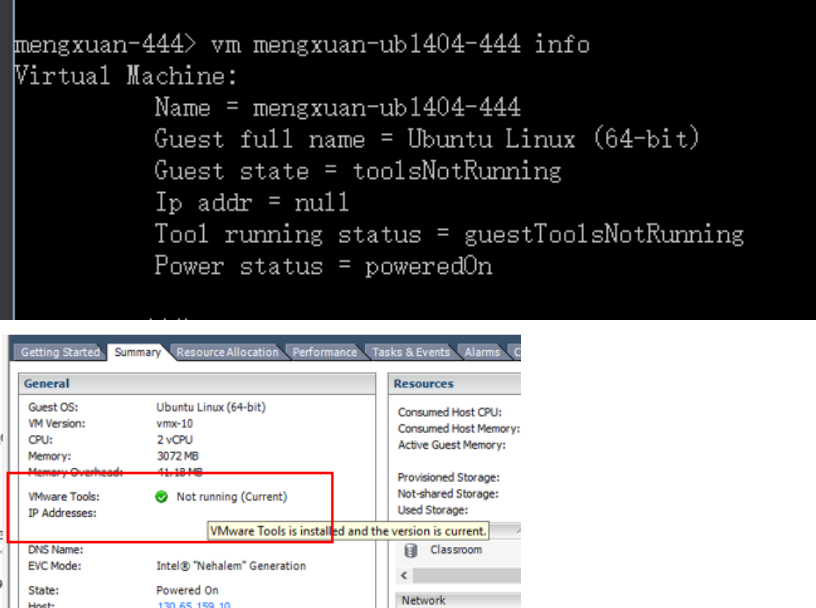
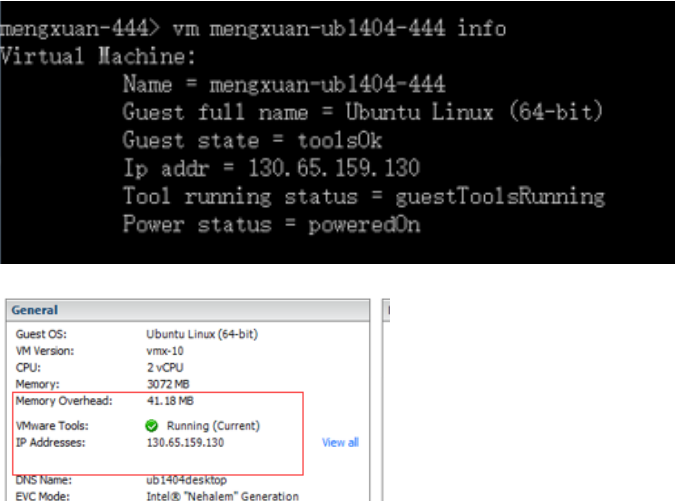
Blow if the operations on my vm:

```

Terminal File Edit View Search Terminal Help
cmperoot@ub1404desktop: ~
cmperoot@ub1404desktop:~$ sudo /etc/vmware-tools/services.sh stop
[sudo] password for cmperoot:
Stopping VMware Tools services in the virtual machine:
  Guest operating system daemon: done
  Unmounting HGFS shares: done
  Guest filesystem driver: done
cmperoot@ub1404desktop:~$

```

1. Compare the output with that from “vm <YourVM> info” in Q2. What are the differences, and why?

<p>Manually turn off tool daemon</p>	 <pre> mengxuan-444&gt; vm mengxuan-ub1404-444 info Virtual Machine:   Name = mengxuan-ub1404-444   Guest full name = Ubuntu Linux (64-bit)   Guest state = toolsNotRunning   Ip addr = null   Tool running status = guestToolsNotRunning   Power status = poweredOn </pre>
<p>Result in Q2</p>	 <pre> mengxuan-444&gt; vm mengxuan-ub1404-444 info Virtual Machine:   Name = mengxuan-ub1404-444   Guest full name = Ubuntu Linux (64-bit)   Guest state = toolsOk   Ip addr = 130.65.159.130   Tool running status = guestToolsRunning   Power status = poweredOn </pre>

From the above information, we can see the differences below:

- Guest state is toolsNotRunning in VM console, while the result in Q2, guest state

is toolsOk.

- b. Ip address is null in VM console, while the result in Q2, Ip address is available which is 130.65.159.30.
- c. Tool running state is guestToolNotRunning, while the result in Q2, tool running state is guestToolRunning.

Reason :

Because by using the manual command I typed in VM console, I turned off VMWare tool daemon.

2. Compare the output with that from “vm <YourVM> shutdown” in Q2. What are the differences, and why?

Manually  
turn off  
tool  
daemon

```
mengxuan-444> vm mengxuan-ub1404-444 shutdown
Virtual Machine:
  Name = mengxuan-ub1404-444
Failed: Virtual Machine Guestmengxuan-ub1404-444 shut down failed.
```

Name	Target	Status	Details	Initiated by	Requested Start Time	Start Time	Completed Time
Initiate guest OS shutdown	mengxuan-ub1404-444	Cannot complete operation because VMware Tools is not running in this virtual machine.		VSPHERELOCAL[cmpe281_sec3_student]	2016/10/7 0:53:02	2016/10/7 0:53:02	2016/10/7 0:53:02
Power On virtual machine	mengxuan-ub1404-444	Completed	System	COE-CHPE-VC...	2016/10/7 0:39:42	2016/10/7 0:39:42	2016/10/7 0:39:45
Initiate guest OS shutdown	mengxuan-ub1404-444	Completed	VSPHERELOCAL[cmpe281_sec3_student]	COE-CHPE-VC...	2016/10/7 0:54:30	2016/10/7 0:54:30	2016/10/7 0:54:30
Power On virtual machine	mengxuan-ub1404-444	Completed	System	COE-CHPE-VC...	2016/10/7 0:26:12	2016/10/7 0:26:12	2016/10/7 0:26:15
Power On virtual machine	mengxuan-ub1404-444	Completed	System	COE-CHPE-VC...	2016/10/7 0:12:46	2016/10/7 0:12:46	2016/10/7 0:12:52
Power Off virtual machine	mengxuan-ub1404-444	The attempted operation cannot be performed in the current state.		VSPHERELOCAL[cmpe281_sec3_student]	2016/10/7 0:03:54	2016/10/7 0:03:54	2016/10/7 0:03:54

Task Details  
Name: Initiate guest OS shutdown Target: mengxuan-ub1404-444 Initiated by: VSPHERELOCAL[cmpe281\_sec3\_student]  
Status: Cannot complete operation because VMware Tools is not running in this virtual machine.  
Related Events: [Show](#)

Result in  
Q2

```
mengxuan-444> vm mengxuan-ub1404-444 shutdown
Virtual Machine:
  Name = mengxuan-ub1404-444
Shutdown guest: completed, time = 07/10/2016 20:32:18
```

Name	Target	Status	Details	Initiated by	Requested Start Time	Start Time	Completed Time
Initiate guest OS shutdown	mengxuan-ub1404-444	Completed		VSPHERELOCAL[cmpe281_sec3_student]	2016/10/7 20:32:06	2016/10/7 20:32:06	2016/10/7 20:32:06
Power On virtual machine	mengxuan-ub1404-444	Completed	System	VSPHERELOCAL[cmpe281_sec3_student]	2016/10/7 20:31:22	2016/10/7 20:31:22	2016/10/7 20:31:25
Power Off virtual machine	mengxuan-ub1404-444	Completed	VSPHERELOCAL[cmpe281_sec3_student]	COE-CHPE-VC...	2016/10/7 20:31:15	2016/10/7 20:31:15	2016/10/7 20:31:17
Power On virtual machine	mengxuan-ub1404-444	Completed	System	VSPHERELOCAL[cmpe281_sec3_student]	2016/10/7 20:28:22	2016/10/7 20:28:22	2016/10/7 20:28:25
Power Off virtual machine	mengxuan-ub1404-444	The attempted operation cannot be performed in the current state.		VSPHERELOCAL[cmpe281_sec3_student]	2016/10/7 20:21:25	2016/10/7 20:21:25	2016/10/7 20:21:25

From the above information, we can see the difference below:

Shutdown command failed in VM console, while the result in Q2, shutdown command is completed.

Reason:

shutdown command failed in VM console, because of VMware tools is not running in this virtual machine.

#### Q4

How my codes waits until task completes :

By Using the function called `waitForTask()`.

```
System.out.println("Warning: Virtual Machine Guest" + vmName + " is already stopped.");
}
else if (vmri.getPowerState() == VirtualMachinePowerState.poweredOn){
    vmInstance.shutdownGuest();
    SimpleDateFormat time_formatter = new SimpleDateFormat("dd/MM/yyyy HH:mm:ss");
    String current_time_str = time_formatter.format(System.currentTimeMillis());

    long start = System.currentTimeMillis();
    while (vmInstance.getRuntime().getPowerState() != VirtualMachinePowerState.poweredOff) {
        Thread.sleep(2000);
        if (System.currentTimeMillis() - start >= 3 * 60 * 1000) {
            System.out.println("Graceful shutDown failed. Now try a hard power off.");
            turnoffCore(vmName, vmInstance);
            return;
        }
    }
    System.out.println("Shutdown guest: completed, time = " + current_time_str);
}
} catch (Exception e) {
    System.out.println("Failed: Virtual Machine Guest" + vmName + " shut down failed.");
}
```

#### Extra Credit:

```
try {
    Task task = vmInstance.powerOnVM_Task(null);

    SimpleDateFormat time_formatter = new SimpleDateFormat("dd/MM/yyyy HH:mm:ss");

    String result = task.waitForTask();
    TaskInfo info = task.getTaskInfo();
    String formatted = time_formatter.format(info.getCompleteTime().getTime());

    if (TaskInfoState.success.equals(info.getState())) { // success
        System.out.println("Power on VM: status = " + result + ", completion time = " + formatted);
    } else {
        System.out.println("Power on VM: status = "
            + info.getError().getLocalizedMessage()
            + ", completion time = " + info.getCompleteTime());
    }
} catch (InterruptedException ex) {
    System.out.println("Failed: Virtual Machine Guest" + vmName + " failed to start.");
} catch (RemoteException ex) {
    System.out.println("Failed: Virtual Machine Guest" + vmName + " connection failed.");
}
```