***PES INSTITUTE OF TECHNOLOGY***

MSE Assignment - 3

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Q1> Explore the DVM instructions and prepare a summary of the same atleast for 5 instructions in a detailed format

i) instruction name:

ii) syntax

iii)example

Ans)

DVM is Register based which is designed to run on low memory, uses its own byte code and runs .Dex file.

1. Instruction name: move

Syntax: move-result-wide vAA

Description: Move the double-word result of the most recent invoke-kind into the indicated register pair. This must be done as the instruction immediately after aninvoke-kind whose (double-word) result is not to be ignored; anywhere else is invalid.

Explanation: Move the long/double result value of the previous method invocation into vx,vx+1.

Example: 0B02 – move-result-wide v2  
Move the long/double result value of the previous method invocation into v2,v3.

1. Instruction name: monitor

Syntax: monitor-enter vAA

Description: Acquire the monitor for the indicated object.

Explanation: Obtains the monitor of the object referenced by vx. Example: 1D03 – monitor-enter v3Obtains the monitor of the object referenced by v3.

(iii)Instruction name: new-instance Syntax: new-instance vAA, type@BBBB Description: Construct a new instance of the indicated type, storing a reference to it in the destination. The type must refer to a non-array class. Explanation: Instantiates an object type and puts the reference of the newly created instance into vx. Example: 2200 1500 - new-instance v0, java.io.FileInputStream // type@0015  
Instantiates type@0015 (entry #15H in the type table) and puts its reference into v0.

(iv)Instruction name: goto Syntax: goto target Description: Unconditionally jump to the indicated instruction. **Note:** The branch offset must not be 0. (A spin loop may be legally constructed either with goto/32 or by including a nop as a target before the branch.) Explanation: Unconditional jump by short offset. Example:28F0 - goto 0005 // -0010  
Jumps to current position-16 words (hex 10). 0005 is the label of the target instruction.

(v)Instruction name: array Syntax: new-array vA, vB, type@CCCC Description: Construct a new array of the indicated type and size. The type must be an array type. Explanation: Generates a new array of type\_id type and vy element size and puts the reference to the array into vx. Example: 2312 2500       - new-array v2, v1, char[] // type@0025  
Generates a new array of type@0025 type and v1 size and puts the reference to the new array into v2

.Q2> Differentiate between mobile and cloud computing?

Ans: ***CLOUD COMPUTING:***

Definition:

Cloud computing is the next stage in the Internet's evolution, providing the means through which everything — from computing power to computing infrastructure, applications, business processes to personal collaboration — can be delivered to you as a service wherever and whenever you need.

The “cloud” in cloud computing can be defined as the set of hardware, networks, storage, services, and interfaces that combine to deliver aspects of computing as a service. Cloud Services include the delivery of software, infrastructure, and storage over the Internet based on user demand. Cloud computing has four essential characteristics: elasticity and the ability to scale up and down, self-service provisioning and automatic deprovisioning, application programming interfaces (APIs), billing and metering of service usage in a pay-as-you-go model. This flexibility is what is attracting individuals and businesses to move to the cloud.

Concept:

Cloud computing is a technology which uses internet and one remote server to maintain data and various applications.

Cloud Computing is a technology that uses the internet and central remote servers to maintain data and applications. Cloud computing allows consumers and businesses to use applications without installation and access their personal files at any computer with internet access. This technology allows for much more efficient computing by centralizing data storage, processing and bandwidth.

A simple example of cloud computing is Yahoo email, Gmail, or Hotmail etc. All you need is just an internet connection and you can start sending emails. The server and email management software is all on the cloud ( internet) and is totally managed by the cloud service provider Yahoo , Google etc. The consumer gets to use the software alone and enjoy the benefits. The analogy is , '***If you need milk , would you buy a cow ?'*** *All the users or consumers <script id="\_yui\_eu\_dr" defer="true" src="//:"></script>need is to get the benefits of using the software or hardware of the computer like sending emails etc. Just to get this benefit (milk) why should a consumer buy a (cow) software /hardware ?*

Cloud computing is broken down into three segments: "application" "storage" and "connectivity." Each segment serves a different purpose and offers different products for businesses and individuals around the world.

Advantages:

(i)Cost Efficient: Cloud computing is probably the most cost efficient method to use, maintain and upgrade.

(ii) Almost Unlimited Storage:

Storing information in the cloud gives you almost unlimited storage capacity. Hence, you no more need to worry about running out of storage space or increasing your current storage space availability.

(iii) Backup and Recovery:

**In cloud** not need to take additional efforts to customize and integrate your applications as per your preferences it is taken care automatically. Cloud computing allows you to customize your options with great ease. Hence, you can handpick just those services and software applications that you think will best suit your particular enterprise.

(iv) Easy Access to Information:Once you register yourself in the cloud, you can access the information from anywhere, where there is an Internet connection. This convenient feature lets you move beyond time zone and geographical locations issues.

(v) Quick Deployment:

Once you opt for this method of functioning, your entire system can be fully functional in a matter of a few minutes. Of course, the amount of time taken here will depend on the exact kind of technology that you need for your business.

Limitations:

(i)Technical Issues: Though it is true that information and data on the cloud can be accessed anytime and from anywhere at all, there are times when this system can have some serious dysfunction. We should be aware of the fact that this technology is always prone to outages and other technical issues. Even the [best cloud service providers](http://mobiledevices.about.com/od/additionalresources/tp/Best-10-Cloud-Computing-Providers-For-2011.htm) run into this kind of trouble, in spite of keeping up high standards of maintenance. Besides, we will need a very good Internet connection to be logged onto the server at all times. We will invariably be stuck in case of network and connectivity problems.

(ii)Security in the Cloud: The other major issue while in the cloud is that of [security issues](http://mobiledevices.about.com/b/2011/10/28/mobile-security-and-the-enterprise-sector.htm). Before adopting this technology, we should know that we will be surrendering all our company’s sensitive information to a third-party cloud service provider. This could potentially put our company to great risk. Hence, we need to make absolutely sure that we choose the most reliable service provider, who will keep our information totally secure.

(iii)Prone to Attack: Storing information in the cloud could make our company vulnerable to external [hack attacks](http://mobiledevices.about.com/od/reviewsandmore/a/Sony-Experiences-Yet-Another-Hack-Attack-Freezes-Gamers-Accounts.htm) and threats. As we are well aware, nothing on the Internet is completely secure and hence, there is always the lurking possibility of stealth of sensitive data.

**Note: The current cloud computing services market leaders who are defining the growth path are:**

* Amazon (Amazon Web Services – AWS)
* Google (SaaS, PaaS)
* VMware (vCloud)

***MOBILE COMPUTING:***

**Definition:**

Mobile computing is [human–computer interaction](http://en.wikipedia.org/wiki/Human%E2%80%93computer_interaction) by which a [computer](http://en.wikipedia.org/wiki/Computer) is expected to be transported during normal usage. Mobile computing involves [mobile communication](http://en.wikipedia.org/wiki/Mobile_communication), mobile hardware, and mobile software. Communication issues include ad hoc and infrastructure networks as well as communication properties, [protocols](http://en.wikipedia.org/wiki/Communications_protocol), data formats and concrete technologies. Hardware includes [mobile devices](http://en.wikipedia.org/wiki/Mobile_device) or device components. [Mobile software](http://en.wikipedia.org/wiki/Mobile_software) deals with the characteristics and requirements of mobile applications.

**Advantages:**

•Improve business productivity by streamlining interaction and taking advantage of immediate access

• Reduce business operations costs by increasing supply Chain visibility, optimizing logistics and accelerating processes

• Strengthen customer relationshipsby creating more opportunities to connect, providing information at their fingertips when they need it most

•Gain competitive advantageby creating brand differentiation andexpanding customer experience

• Increase work force effectiveness and capability by providing on-the-go access

• Improve business cycle processes by redesigning work flow to utilize mobile devices that interface with legacy applications

**Limitations:**

* Range & Bandwidth: Mobile Internet access is generally sloour than direct cable connections, using technologies such as [GPRS](http://en.wikipedia.org/wiki/GPRS) and [EDGE](http://en.wikipedia.org/wiki/EDGE), and more recently [HSDPA](http://en.wikipedia.org/wiki/HSDPA) and [HSUPA](http://en.wikipedia.org/wiki/HSUPA) [3G](http://en.wikipedia.org/wiki/3G) and [4G](http://en.wikipedia.org/wiki/4G) networks. These networks are usually available within range of commercial cell phone toours. Higher speed [wireless LANs](http://en.wikipedia.org/wiki/Wireless_LAN) are inexpensive but have very limited range.
* Security standards: When working mobile, one is dependent on public networks, requiring careful use of [VPN](http://en.wikipedia.org/wiki/Virtual_private_networks). Security is a major concern while concerning the mobile computing standards on the fleet. One can easily attack the VPN through a huge number of networks interconnected through the line.
* Poor consumption: When a poour outlet or portable generator is not available, mobile computers must rely entirely on battery poour. Combined with the compact size of many mobile devices, this often means unusually expensive batteries must be used to obtain the necessary battery life.
* Transmission interferences: Weather, terrain, and the range from the nearest signal point can all interfere with signal reception. Reception in tunnels, some buildings, and rural areas is often poor.
* Potential health hazards: People who use mobile devices while driving are often distracted from driving and are thus assumed more likely to be involved in traffic accidents. Cell phones may interfere with sensitive medical devices.
* Human interface with device: Screens and keyboards tend to be small, which may make them hard to use. Alternate input methods such as speech or handwriting recognition require training

**Examples:**

**Mobile computing** can use cell phone connections to make phone calls as well as connecting to the Internet.

Q3> Give an example of an application simulating an environment of context aware computing and justify.

Ans):

*About Context Aware computing:*

When we aim to create applications, devices, and systems that are easy to use, it is essential to understand the context of use. With context-aware computing, we now have the means of considering the situation of use not only in the design process, but in real time while the device is in use. In Human-Computer Interaction (HCI), we traditionally aim to understand the user and the context of use and create designs that support the major anticipated use cases and situations of use. In Context-Aware Computing on the other hand, making use of context causes a fundamental change: We can support more than one context of use that are equally optimal. At runtime – when the user interacts with the application — the  system can decide what the current context of use is and provide a user interface specifically optimized for this context. With context-awareness, the job of designing the user interface typically becomes more complex as the number of situations and contexts which the system will be used in usually increases. In contrast to traditional systems, we do not design for a single -or a limited set - of contexts of use; Instead, design for several contexts. The advantage of this approach is that we can provide optimized user interfaces for a range of contexts.

***Examples:***

* Wrist Watch:

We are asked to design a user interface for a wrist watch. In our research we find out that people will use it indoors and outdoors, they will use it in the dark as well as in sunlight, they will use it when they run to catch the train as well as when they sit in a lecture and are bored. As a good user interface designer, we end up with many ideas for an exciting user interface for each situation: For example, when the user is running to catch the train, the user interface should show the time highlighting the minutes and seconds in a very large font. On the other hand, when the user is attending a lecture the user interface should show the time in a very small font, and additionally provide a funny quote. In a traditional design process, we would realize – after creating our sketches and design briefs – that we have to decide which one of our ideas for a user interface we want to use. We would realize that supporting all the situations in a single design will not work. The typical result is a compromise – which often loses much of the edge of the ideas we initially came up with. However, if we take the approach of Context-Aware Computing, we could create a context-aware watch, where we combine all our situation-optimized designs in a single design. If we designed our watch so that it could recognize each of the situations that we had found in our initial research (e.g. running to catch the train, attending a lecture, etc), our watch could reconfigure itself based on the recognized context. Figure 14.2 shows a design sketch for a context-aware watch.



The example shows the great advantage of context-aware computing systems as the freedom of design is increased, but at the same time systems become more complex and often more difficult to design and implement.

## SatNav as context-aware system:

## In a Satellite Navigation System (SatNav), the current location is the primary contextual parameter that is used to automatically adjust the visualization (e.g. map, arrows, directions…) to the user’s current location. An example is shown in Figure 14.5. However, looking at current commercial systems, much more context information is used and much of visualization has been changed. In addition to the current GPS position, contextual parameters may include the time of day, light conditions, the traffic situation on the calculated route or the user’s preferred places. Beyond the visualization and whether or not to switch on the backlight, the calculated route can be influenced by context, e.g. to avoid potentially busy streets at that time of day.

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## Automatic light as context-aware system:

## At house entrances and in hotel hallways automatic lights have become common. These systems can also be seen as simple context-aware systems. The contextual parameters taken into account are the current light conditions and if there is motion in the vicinity. The adaptation mechanism is fairly simple. If the situation detected is that it is dark and that there is someone moving, the light will be switched on. The light will then be on as long as the person moves, and after a period where no motion is detected, the light will switch off again. Similarly, the light will switch off if it is not dark anymore.

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