**Mobile System Engineering (MSE) ASSIGNMENT**

**10CS403**

Name : Kavyashree A

USN : 1PI10IS045

Dept : Information Science

Sem & Section : VII ‘A’

**Questions:**

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

**i) instruction name:**

**ii) syntax**

**iii)example**

**Answer:**

1. Move instruction

Instruction name : move

Syntax : move vA, vB

A: destination register (4 bits)  
 B: source register (4 bits)

Op and format : 01 12x

Description : Move the contents of one non-object register to another.

Example : 0110 – move v0, v1  
 Moves v1 into v0.

1. Array-Length instruction

Instruction name : array-length

Syntax : array-length vA, vB

A: destination register (4 bits)  
 B: array reference-bearing register (4 bits)

Op and format : 21 12x

Description : Store in the given destination register the length of the indicated array, in entries.

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.

1. New-array instruction

Instruction name : new-array

Syntax : new-array vA, vB, type@CCCC

A: destination register (8 bits)  
 B: size register  
 C: type index

Op and format : 23 22c

Description : Construct a new array of the indicated type and size. The type must be an array type.

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.

1. Goto instruction

Instruction name : goto

Syntax : goto +AA

A: signed branch offset (8 bits)

Op and format : 28 10t

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.)

Example: 28F0 - goto 0005 // -0010  
Jumps to current position-16 words (hex 10). 0005 is the label of the target instruction.

1. New-instance instruction

Instruction name : new-instance

Syntax : new-instance vAA, type@BBBB

A: destination register (8 bits)  
 B: type index

Op and format : 22 21c

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.

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.

**Q2> Differentiate between mobile and cloud computing**

**Answer:**

**Mobile computing:**

Mobile computingis human–computer interaction by which a computer is expected to be transported during normal usage. Mobile computing involves mobile communication, mobile hardware, and mobile software. Communication issues include ad hoc and infrastructure networks as well as communication properties, protocols, data formats and concrete technologies. Hardware includes mobile devices or device components. Mobile software deals with the characteristics and requirements of mobile applications. Involves taking a physical device with you. This could be a laptop or a mobile phone or some device which enables you to [telework](http://en.wikipedia.org/wiki/Telecommuting)  – working wherever you go because of the small size of the device you’re using.

Characteristics that make mobile different from regular cloud computing :

* Total cloud dependency
* Mobile cloud computing needs to overcome mobile device differences
* Mobile cloud computing needs to allow for disconnected operation
* Mobile cloud computing needs to be communication fault tolerant
* Distance matters in mobile cloud computing
* Mobile cloud computing needs to be mindful of limited energy availability on mobiles
* Expanded testing capabilities.

Advantages :

* Increase in Productivity- Mobile devices can be used out in the field of various companies, therefore reducing the time and cost for clients and themselves.
* Entertainment- Mobile devices can be used for entertainment purposes, for personal and even for presentations to people and clients.
* Portability- this would be one of the main advantages of mobile computing, you are not restricted to one location in order for you to get jobs done or even access email on the go.

Disadvantages:

* Range & Bandwidth: Mobile Internet access is generally slower than direct cable connections,
* Security standards: When working mobile, one is dependent on public networks, requiring careful use of VPN.
* Power consumption: When a power outlet or portable generator is not available, mobile computers must rely entirely on battery power.
* 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.
* 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.

Mobile apps demand a lot more from the mobile cloud than regular cloud computing. Most of these differences are due to the limited energy availability, network latencies and unreliable connectivity in mobile devices. Fortunately, recognizing these differences and adding additional capabilities to the mobile cloud to address them, you can deliver as good an end user experience on mobiles, as you can on desktops and laptops.

**Cloud computing**:

One of the new buzz words of 2008, allows you to store your files and folders in a “cloud” area on the Internet, allowing you access to all of your files and folders wherever you are in the world – but you do need a physical device with Internet access to access it.

Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and is composed of five essential characteristics, three service models, and four deployment models.

Characteristics of Cloud Computing :

* Self-provisioning of resources and elasticity. Cloud computing users are able to,

without human assistance, acquire any amount of computing capabilities.

* Pay-per-use. Costs of cloud computing services are based on usage.
* On demand availability. Cloud services are always accessible, platform independent

and are commonly accessed through a web browser or web service API.

* Scalability. Computation resources are perceived to be unlimited in the sense of

matching any resource demands that the user have.

* Resource pooling. Data and resources are divided on a vast amount of servers that

usually are spread geographically; the resources needed are then directed based on the

computational need of the service.

* [Virtualization](http://en.wikipedia.org/wiki/Virtualization) technology allows sharing of servers and storage devices and increased utilization. Applications can be easily migrated from one physical server to another.
* [Maintenance](http://en.wikipedia.org/wiki/Software_maintenance) of cloud computing applications is easier, because they do not need to be installed on each user's computer and can be accessed from different places.

Advantages:

* Cloud computing relies on sharing of resources to achieve coherence and economies of scale, similar to a utility (like the electricity grid) over a network.
* Maintenance is easier.
* The cloud also focuses on maximizing the effectiveness of the shared resources. Cloud resources are usually not only shared by multiple users but are also dynamically reallocated per demand. This can work for allocating resources to users.
* Cost Efficient : Cloud computing is probably the most cost efficient method to use, maintain and upgrade.
* Backup and Recovery : Since all your data is stored in the cloud, backing it up and restoring the same is relatively much easier than storing the same on a physical device.
* Quick Deployment : Lastly and most importantly, cloud computing gives you the advantage of quick deployment.

Disadvantages:

* Can have all your files synchronized between devices so wherever you go, you’ll always have access to your files, but the technology doesn’t fully exist yet.
* It’s getting there, but it’s slow and temperamental, difficult to use and often the average user gets confused as to where the files are actually stored and/or where else they are stored.
* Security in the Cloud : The other major issue while in the cloud is that of security issues. A virus, for instance, hiding in the "cloud" would be able to infect every local computer that connects to it.
* Prone to Attack : Storing information in the cloud could make your company vulnerable to external attacks and threats.

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

**Answer:**

Context-aware computing involves the sensing of available resources to provide appropriate information and services depending on the state of each element in an application’s context. In recent years, futuristic computing environments that utilize contextual information have sparked interest within the general public to experience these new spaces.

**iCAP:**

The interactive Context-aware Application Prototyper (iCAP) is a system aimed at lowering barriers for non-programmers to build context-aware applications without requiring them to write any code. iCAP is a visual environment that acts as the intermediate layer between low-level toolkits and users, allowing users to prototype and deploy their application to a real context-aware environment, or to simulate the application within the iCAP system.

* The simulation feature is important for people in minority and rural areas who are unable to easily obtain the hardware to instrument a ubiquitous computing environment.
* By building an application with iCAP and simulating it, users are able to gain confidence in their programming abilities, and can easily transition to deploying their application when a real context-aware environment becomes available.

1. iCAP interface:

* iCAP provides an intuitive visual environment that takes advantage of human spatial reasoning skills, making it simple for those without any programming experience to prototype context-aware applications.
* The system uses a lightweight, informal visual interface that gives users the familiar feel of sketching and rapid prototyping as if designing on paper. This is especially useful for non-programmers who may be intimidated by technology and find themselves insecure in using a fancy formal interface.

2.Interface:

* Interaction with the iCAP visual interface consists of three simple steps. First, the user sketches numerous inputs and outputs.
* This includes defining different locations and people in the context-aware world. Then these elements are dragged and dropped into the center area to construct rule-based conditions.
* Finally the entire set of rules is prototyped and simulated (or deployed to a context infrastructure) using the prototyping mode in the iCAP system.

Conclusion:

iCAP provides support for non-programmers to explore the domain of context-aware computing through an intuitive visual interface. Without having to write any code, individuals are able to program their environments and experience the richness of ubiquitous computing. iCAP is equipped with features for advanced applications that take advantage of relationship-based and personalization-based features. As the novice programmer becomes comfortable with simple context-aware applications, he can continue to use iCAP and easily create more advanced applications while building experience and confidence in dealing with technology. The next steps with iCAP include further validation of the tool through formal user testing, and improving the expressiveness of the tool with respect to the variety of applications that can be built with it.