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

Solution:-

Dalvik is the process virtual machine (VM) in Google's Android operating system.The Dalvik VM is register-based and consists of frames. Each frame consists of a particular number of registers as well as the program counter and a reference to the .dex file.

The storage unit in the instruction stream is a 16-bit unsigned quantity

Instructions aren't gratuitously limited to a particular type. There are separately enumerated and indexed constant pools for references to strings, types, fields, and methods.

Bitwise literal data is represented in-line in the instruction stream.

Syntax of DVM Instructions:-

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Dest-then-source ordering for arguments.

Some opcodes have a disambiguating name suffix to indicate the type(s) they operate on:

Type-general 32-bit opcodes are unmarked.

Type-general 64-bit opcodes are suffixed with -wide.

Type-specific opcodes are suffixed with their type (or a straightforward abbreviation), one of: -boolean -byte -char -short -int -long -float -double -object -string -class -void.

Examples of DVM Instructions:-

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1>  **Instruction Name:** move

**Syntax:** move vA, vB

where,

A: destination register (4 bits)

B: source register (4 bits)

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

**Example:** 0110 - move v0, v1

Moves v1 into v0.

2>  **Instruction Name:** int-to-byte

**Syntax:** int-to-byte vx,vy

where,

vx: destination registre

vy: source register

**Explanation:** Converts the int value in vy to a byte value and stores it in vx.

**Example:** 8D00 - int-to-byte v0, v0

Converts the integer in v0 into a byte and puts the byte value into v0

3> **Instruction Name:** add-int

**Syntax:** add-int vx,vy,vz

where,

vx: destination registre

vy,vz: source register

**Explanation:** Calculates vy+vz and puts the result into vx.

**Example:** 9000 0203 - add-int v0, v2, v3

Adds v3 to v2 and puts the result into v0.

4> **Instruction Name:** sub-int

**Syntax:** sub-int vx,vy,vz

where,

vx: destination registre

vy,vz: source register

**Explanation:** Calculates vy-vz and puts the result into vx.

**Example:** 9100 0203 - sub-int v0, v2, v3

Subtracts v3 from v2 and puts the result into v0.

5> **Instruction Name:** mul-int

**Syntax:** mul-int vx, vy, vz

where,

vx: destination registre

vy,vz: source register

**Explanation:** Multiplies vz with wy and puts the result int vx.

**Example:** 9200 0203 - mul-int v0,v2,v3

Multiplies v2 with w3 and puts the result into v0

6> **Instruction Name:** div-int

**Syntax:** div-int vx,vy,vz

where,

vx: destination registre

vy,vz: source register

**Explanation:** Divides vy with vz and puts the result into vx.

**Example:** 9303 0001 - div-int v3, v0, v1

Divides v0 with v1 and puts the result into v3.

7> **Instruction Name:** rem-int

**Syntax:** rem-int vx,vy,vz

where,

vx: destination registre

vy,vz: source register

**Explanation:** Calculates vy % vz and puts the result into vx.

**Example:** 9400 0203 - rem-int v0, v2, v3

Calculates v3 % v2 and puts the result into v0.

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Q2> Differentiate between mobile and cloud computing

Solution:-

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| --- | --- |
| **Mobile Computing** | **Cloud Computing** |
| * Mobile computing is **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 includes ad hoc and infrastructure networks, protocols, data formats etc. Hardware includes mobile devices or device components. Mobile software deals with the characteristics and requirements of mobile applications. * Cloud Computing **allows you to store your files and folders in a cloud area on the Internet**, allowing access to all of your files and folders anywhere in the world – but it **needs a physical device with Internet access to access it**. * **Advantages**:-   Cost Effective  Almost Unlimited Storage  Backup and Recovery  Automatic Software Integration  Easy Access to Information  Quick Deployment   * **Disadvantages**:-   Security  Prone to Attack  Technical Dysfunctioning | * **Distributed computing over a network**, and means the ability **to run a program or application on many connected computers at the same time**. * Cloud computing relies on **sharing of resources** to achieve coherence and economies of scale, similar to a **utility over a network**. Focuses on maximizing the effectiveness of the shared resources * Mobile computing is **taking a physical device with you**. This could be a laptop or a mobile phone or some device which enables you to telework – **working wherever you go because of the small size of the device being used**. * **Advantages**:-   Location flexibility  Saves time  Enhanced Productivity  Ease of research  Entertainment  Streamlining of Business   * **Disadvantages**:-   Limited processing power  Limited transmission power  Low bandwidth  Limited battery power |

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

Solution:-

Context-aware applications determine information such as current location, activity, time and so on and make assumptions with regard to users’ needs in the current situation, then present information believed to be appropriate in the circumstances.

EXAMPLE:- **Google Latitude** uses the following ways to locate exact position on Earth-GPS,Tower/Signal INFO,IP adress and Digital Compass Signal to show direction. The context taken into account is the Location and Time..It also shows your friends location on the map if they are using the same application or sharing location