VIT®

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

Microprocessors and Interfacing

(CSE – 3002)

DIGITAL ASSIGNMENT - 1

Name: **Vibhu Kumar Singh**

Reg. No: **19BCE0215**

Teacher: **Mr. Konguvel E.**

Vibhu Kumar Singh
19BCE0215
__/__/____

CSE 2006

Microprocessors & Interfacing

DIGITAL ASSIGNMENT-1

Ans1) 8087 ALP to calculate volume of sphere:

```
DATA SEGMENT
    RADIUS DD 2.57
    CONSTANT EQU 1.333
    Volume DD01 DUP<??>
DATA ENDS
ASSUME CS: CODE, DS: DATA
Volume proc near
Code segment
 start:
        MOV AX,DATA
        MOV DS,AX
        FILD RADNS
        FSTP ST(2)
        FMUL ST(2)
        FMUL ST(2)
        FSTP ST(1)
        FLD CONSTANT
        FMUL ST(0), ST(1)
        FSTP ST(3)
        FLD PI
        FMUL ST(0),ST(3)
        FST Volume
        RETP
```

Vibhu Kumar Singh
19BCE0245

```
Volume   ENDP
CODE     ENDP
END      START.
```

Ans2) 8087 ALP to calculate $A = \frac{xyz}{\sqrt{x^2+y^2+z^2}}$, assuming x,y,z are integers.

```
FILD x
FMUL z
FSTP ST(1)
FILD y
FMUL
F ADD ST(1)
FILD z
FMUL
FADD ST(1)
F SQRT ST
F STP ST(2)
FILD x
FISTP ST(1)
FILD x
FISTP ST(1)
FILD y
FMUL ST, ST(1)
FISTP ST(1)
FILD z
FMUL ST, ST(1)
FDIV ST, ST(2)
INT 3
```

Vithu Kumar Singh
19BCE0215

Ans 3) Arduino code to blink 4 lights with 0.5s on time, and 0.5 sec off time

```
void setup () {
  pinMode (0, OUTPUT) ;
  pinMode (1, OUTPUT) ;
  pinMode (2, OUTPUT) ;
  pinMode (3, OUTPUT) ;
}

Void loop c) {
  digitalWrite (0, HIGH) ;
  delay (500) ;
  digitalWrite (0, LOW) ; digitalWrite (1, HIGH) ;
  delay (500) ;

  digitalWrite (1, LOW) ;
  digitalWrite (2, HIGH) ;
  delay (500) ;

  digitalWrite (2, LOW) ;
  digitalWrite (3, HIGH) ;
  delay (500) ;

  digitalWrite (3, LOW) ;
  delay (500) ;
}
```

Vidhu Kumar Singh
19BCE0215

Ans4) Arduino code for blinking 4 leds lights with 3 secs on time and 1.5 secs off time.

```
Void setup() {
  pinMode(1, OUTPUT);
  pinMode(2, OUTPUT);
  pinMode(3, OUTPUT);
  pinMode(4, OUTPUT);
}

Void loop() {
  digitalWrite(1, HIGH);
  delay(1500);
  digitalWrite(1, LOW);
  digitalWrite(2, HIGH);
  delay(3000);
  digitalWrite(2, LOW);
  digitalWrite(3, HIGH);
  delay(3000);
  digitalWrite(3, LOW);
  digitalWrite(4, HIGH);
  delay(3000);
  digitalWrite(4, LOW);
  delay(1500);
}
```

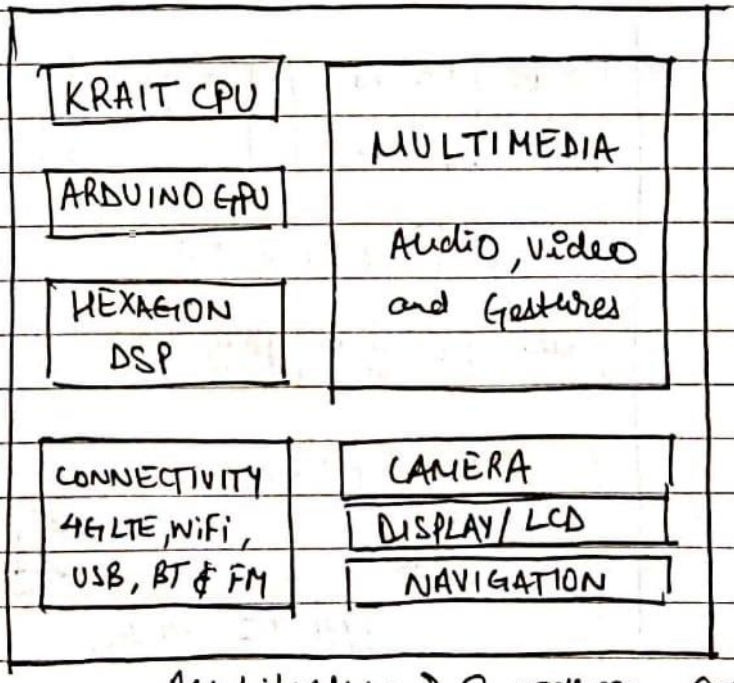
Vithu Kumar Singh
19BCE0215

Ans 5) Draw and explain shortly the architecture of any ~~one~~ one of the following processor

a. Snapdragon
b. ARM processor in iPAD

a.) Snapdragon 600.

The Qualcomm Snapdragon 600 APQ8064T is a high-end SoC for mostly Android based smartphones and tablets that was announced at the beginning of 2013. The chip includes four ARMv7 compatible Krait-300 cores that offer a slightly improved architecture compared to the Krait cores in the S4 processors. However, the performance of cortex-A15 cores should not be reached, but the power consumption should be better.

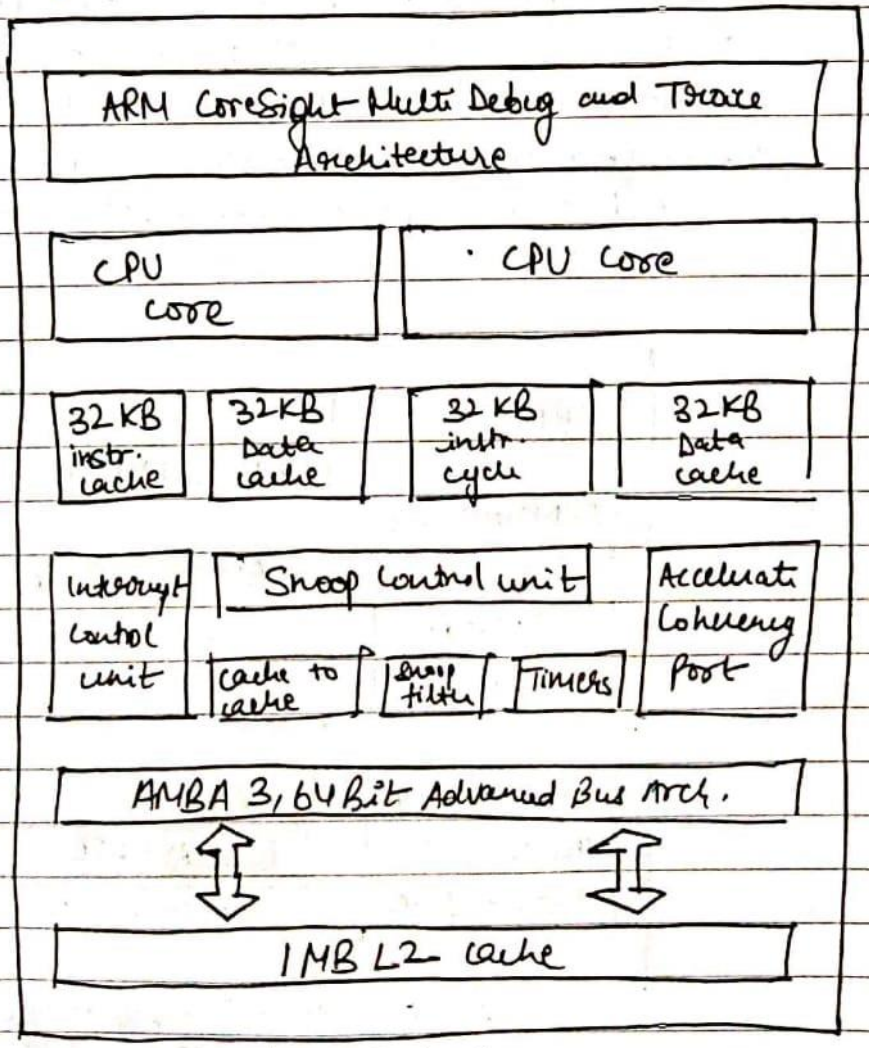


Architecture of Snapdragon 600

Vibhu Kumar Singh
19BCE0215

b) Cortex-A9 MPCore

The cortex A9 processor is a performance and power optimized multi-core processor. It features a dual-~~s~~ issue, partially out-of-order pipline and a flexible system architecture with configurable caches and system coherency using AcP port. The cortex-A9 processor achieves a better than 50% performance over the Cortex-A8 processor in a single-core configuration.



Architecture