İstanbul Bilgi University
Department of Computer Engineering

SPRING, 2019

Campus: Santral

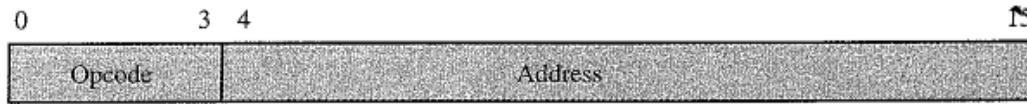**CMPE 312: OPERATING SYSTEMS**

Homework

(Duration: minutes)

Name :

Student ID :

NOTE: Do this HW at home. We will check at lecture' time. No need to handle it.

```
0              3  4                                              15
┌──────────────┬────────────────────────────────────────────────┐
│   Opcode     │                   Address                        │
└──────────────┴────────────────────────────────────────────────┘
```

(a) Instruction format

```
0    1                                                          15
┌────┬───────────────────────────────────────────────────────────┐
│ S  │                    Magnitude                               │
└────┴───────────────────────────────────────────────────────────┘
```

(b) Integer format

Program counter (PC) = Address of instruction
Instruction register (IR) = Instruction being executed
Accumulator (AC) = Temporary storage

(c) Internal CPU registers

1. {100 points} Example of program execution:

   (a) {20 points} Define your own hypothetical machine by fixing the hexadecimal code for at least 3 instructions; one of them MUST be a "jump"

   (b) {20 points} Create your own piece of code containing one jump instruction, and

   (c) {60 points} Execute it by showing the relevant portion of memory's cells, and registers' contents at every steps of the fetch-execute cycle [1]

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[1]Ref: 'A Top-Level View of Computer Function and Interconnection'by William Stalling