North South University

Department of Computer Science and Engineering

Project: Assignment 1, Summer-2018

Course No: **CSE332 Sec 12, 13** Course Title: **Computer Organization and Architecture**

Due: July 12, 2017 (Thursday)

Drop the homework into my office room before start of the Lecture

Total Marks - 20

Submission Guidelines:

1. Softcopy submission is not allowed.

2. No score for late submission

3. It is a group work. You can maintain the same lab group to solve this. You might have to carry on this one towards your final project. So pay special attention and do brainstorming as a group to answer it.

5. Mention group members ID and submit only one copy as a group

Question (Group Work)

Consider yourself as a computer architect and you are employed in a vendor company. The company told you that they are going to design a new 16 bit RISC type of CPU. As an ISA designer your job is to propose a detail design of the ISA. Few of the issues probably you would have to address are given below:

1) How many operands?

2) Types of operand? (Register based?? Memory based? Mixed?)

3) How many operations? why?

4) Types of operations? (Arithmetic, logical, branch type?? How many from each category? Draw a table with list of instructions, instruction type, their opcode, functionality (if any)

5) How many formats would you choose? Draw the formats along with field name and number of bits in each field

6) List of registers? Draw a register table. (With register name and values)

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You must answer those with your reasoning.

While you are deciding on the above issues, you might consider some sample high level program that can be run on this CPU using your ISA. Say, during the decisions about the types of operation to include, you can think about the type of high level language program it will be able to execute. Design might vary from one group to other and there might be multiple possible solutions. You will be scored based on your clear reasoning.

Some sample high level problems are provided. You can think of few other similar problems and design your ISA accordingly:

a) Collect two data from memory and do ADD/AND/OR operations on them. Store the data into the memory.

b) Calculate the sum of first 10 even/odd numbers.