

# **CS2310: Foundations of Computer System Design Lab**

**August-November 2021 Semester**

## **Assignment 8**

**Date: 2<sup>nd</sup> November, 2021**

**Deadline for Submission: 11.59PM on 12<sup>th</sup> November, 2021**

1. Implementation of Hack CPU. The Hack ALU implemented in the Assignment 7 should be used. For registers, available chips can be used.
2. Implementation of Hack Computer. The above implementation of Hack CPU should be used. The Hack Computer should have a 64x16-bit memory, for which the available chip can be used. Locations 0 to 15 in memory are reserved. Locations 16 to 63 can be used to store data and instructions.
3. Execution of sequences of instructions for the following higher level language statements:

$d = a + b - c$  (All operands are unsigned)

if  $(a > b)$  then  $c = a - b$  else  $c = b - a$  (All operands are unsigned)

int  $i = 1$

int  $sum = 0$

while  $(i < 100)$

{  $sum = sum + i;$

$i = i + 1;$

}