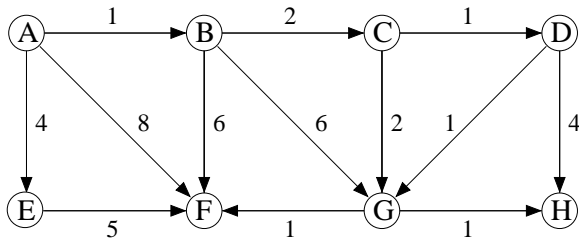# University of Nevada, Las Vegas Las Vegas Computer Science 477/677 Fall 2019
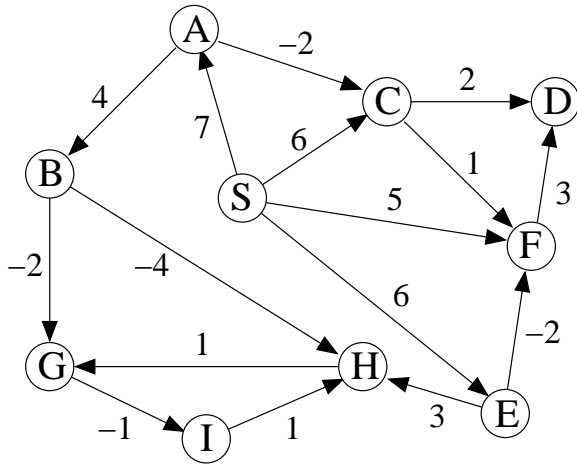## Assignment 5: Due Wednesday October 9, 2019

Name: _____

You are permitted to work in groups, get help from others, read books, and use the internet. But the handwriting on this document must be your own. Print out the document, staple, and fill in the answers. You may attach extra sheets, but only by stapling. Turn in the pages to the graduate assistant at the beginning of class, September 11.

1. Work Problem 4.1 on page 120 of your textbook.

2. Work Problem 4.2 on page 120 of your textbook.

A —-2→ C —2→ D

4 · 7 · 6 · 1 · 3

B · S · 5 · F

-2 · -4 · 6 · -2

G —1→ H

-1 · 1 · 3 · E

I

3. You can transform WARM to COOL in six steps by replacing one letter at each step, as shown below. This sequence is sometimes called a *ladder*. All words in the ladder must be common (not proper) English words. You would like to write a program which finds the shortest ladder between any two given English words, to be input by the user. You will make use of a list of all common 4-letter English words, which you find on the internet. Describe your program. (You don't necessarily have to write pseudo-code.)

Update: I have found a shorter ladder. The word "corp" is probably illegal anyway, since it is an abbreviation for "corporation" and is not in the Scrabble list.

WARM
WARD
CARD
CARP
CORP
COOP
COOL

WARM
WORM
WORK
CORK
COOK
COOL

4. You are working on computer which lacks multipliation and addition. However, it can add or subtract 1 or 2. What does this function do? What is its loop invariant?

```
int double(int n)
 // input condition: n >= 0
 {
  int p = n;
  int q = 0;
  while(p > 0)
   {
    p = p-1;
    q = q+2;
   }
  return q;
 }
```