(60-140) ASSIGNMENT 2

Due: 11:59pm, Oct. 20, 2017

1. **4.12** (p. 70) Show the output produced by each of the following program fragments. Assume that `i` and `j` are `int` variables.

   (a)
   ```
   i = 5;
   j = ++i * 3 - 2;
   printf("%d %d", i, j);
   ```
   (b)
   ```
   i = 5;
   j = 3 - 2 * i++;
   printf("%d %d", i, j);
   ```
   (c)
   ```
   i = 7;
   j = 3 * i-- + 2;
   printf("%d %d", i, j);
   ```
   (d)
   ```
   i = 7;
   j = 3 + --i * 2;
   printf("%d %d", i, j);
   ```

2. **4.1*** (p. 71) Use the RAPTOR program to design an algorithm with flowchart that asks the user to enter a two-digit number, and then prints the number with its digits reversed. A session with the program should have the following appearance:

   ```
   Enter a two-digit number: 28
   The reverse is: 82
   ```

   Save the flowchart in a file named as `a2_2digits.rap`, and submit the file as your solution to this question.

   (Hint: If `n` is an integer, then `n % 10` is the last digit in `n` and `floor(n / 10)` is `n` with the last digit removed.)

3. **4.1** (p. 71) Implement the algorithm to produce a C program that accomplishes what `a2_2digits.rap` does. Save the program in a file named as `a2_2digits.c`, and submit this file as your solution to this question.

4. **5.3** (p. 94) The following program fragments illustrate the short-circuit behavior of logical expressions. Show the output produced by each, assuming that `i`, `j`, and `k` are `int` variables.

   (a)
   ```
   i = 3; j = 4; k = 5;
   printf("%d ", i < j || ++j < k);
   printf("%d %d %d", i, j, k);
   ```
   (b)
   ```
   i = 7; j = 8; k = 9;
   printf("%d ", i - 7 && j++ < k);
   printf("%d %d %d", i, j, k);
   ```
   (c)
   ```
   i = 7; j = 8; k = 9;
   printf("%d ", (i = j) || (j = k);
   printf("%d %d %d", i, j, k);
   ```
   (d)
   ```
   i = 1; j = 1; k = 1;
   printf("%d ", ++i || ++j && ++k);
   printf("%d %d %d", i, j, k);
   ```

5. **5.3*** (p. 96) Use the RAPTOR program to design an algorithm with flowchart that modifies the `broker.c` program of Section 5.2 by making both of the following change:

   (a) Instead of trade value, ask the user to enter the number of share and the price per share.

   (b) Add statements that compute the commission charged by a rival broker ($33 plus $0.03 per share for fewer than 2000 shares; $33 plus $0.02 per share for 2000 shares or more). Display the rival's commission as well as the commission charged by the original broker.

   Save the flowchart in a file named as `a2_broker.rap`, and submit the file as your solution to this question.

6. **5.3** (p. 96) Implement the algorithm to produce a C program that accomplishes what `a2_broker.rap` does, with an additional requirement to use the *conditional operator* (p. 83) at least once in the program. Save the program in a file named as `a2_broker.c`, and submit this file as your solution to this question.