(60-140) ASSIGNMENT 3

Due: 11:59pm, Nov. 4, 2016

1. **5.8** (p. 94) The following `if` statement is unnecessarily complicated. Simplify it as much as possible. (*Hint:* The entire statement can be replaced by a single assignment.)

```
if (age >=13)
  if (age <=19)
    teenage = true
  else
    teenage = false
else if (age < 13)
  teenage = false
```

2. **5.11** (p. 97) Write a program that asks the user for a two-digit number, and then prints the English word for the number:

```
Enter a two-digit number: 45
you entered the number forty-five.
```

   Hint: Break the number into two digits. Use one `switch` statement to print the word for the first digit ("twenty", "thirty", and so forth). Use a second `switch` statement to print the word for the second digit. Don't forget that the numbers between 11 and 19 require special treatment.

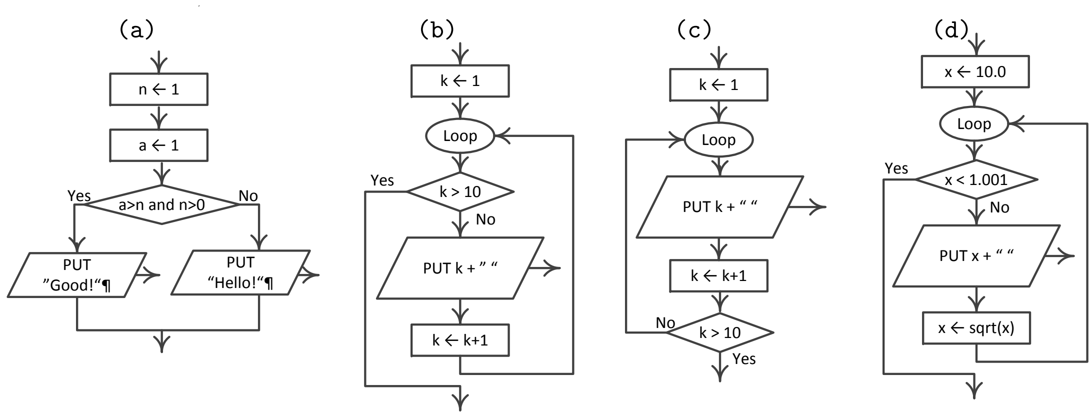
3. **6.1-3** (p. 121) What output does each of the following program fragment produce?

(a)
```
i = 1;
while (i <= 128) {
  printf("%d ", i);
  i *= 2;
}
```

(b)
```
i = 9384;
do {
  printf("%d ", i);
  i /= 10;
} while (i > 0);
```

(c)
```
i = 5;
j = i - 1;
for (; i > 0, j > 0; --i, j = i-1)
  printf("%d ", i);
```

4. What output does each of the following flowcharts produce? Write a program fragment in C for each of the flowcharts, and submit the codes online.



5. **6.11** (p. 124) The value of the mathematical constant ϵ can be expressed as an infinite series:

   `ϵ = 1 + 1/1! + 1/2! + 1/3! + ...`

   Write a program that approximate ϵ by computing the value of

   `ϵ = 1 + 1/1! + 1/2! + 1/3! + ... + 1/n!`

   where n is an integer entered by the user. Save and submit the program as `a3_epsilon0.c`.

6. **6.12*** (p. 124) The attached flowchart `a3_epsilon.rap` provides a modified solution to `Q3.5`. It allows for continuous addition of terms until the current term becomes less than a small (floating-point) number ε entered by the user. Write an equivalent program in C, and save and submit the program as `a3_epsilon1.c`.

   (*Hint:* In implementation, be careful with different types between the two sides of an assignment statement.)