CMPT 125: Assignment 1

- Due Jan. 16 in the beginning of class
- Please hand in hard copy in the assignment box in CSIL lab
- You may write or type your answers

Question 1
(15 marks, each part is 5 marks)

a) Using an example, explain the difference between initialization and declaration in C. You can use pseudocode for your explanation.

b) Consider the code snippet given below. The variable "sum" is of type int. Will this compile? Explain why or why not (3-4 sentences).

```c
int sum = 2 + "2";
```

c) Is it possible for a pointer to refer an address of another pointer? If yes, explain (3-4 sentences) with an example.
Question 2  
(3 marks for parts a and b, 4 marks for part c)

Based on your knowledge of pointers and memory addresses, answer the questions following the code snippet below:

```c
#include <stdio.h>

int hcf(int *x, int *y) {
    *x = *y;
    int a = *x;
    int b = *y;
    while (b != 0) {
        int tmp = b;
        b = a % b;
        a = tmp;
    }
    return a;
}

int main() {
    int a = 54;
    int b = 24;
    int result = hcf(&a, &b);
    return 0;
}
```

Part a  
What will be the value of the result variable after calling hcf function?

Part b  
What will be the value of the variables a and b just before the program terminates?

Part c  
Briefly explain (in 1 or 2 sentences) your answers to part a and part b of this question.
Question 3
(20 marks, each part is 5 marks)

For the following snippets, how many times is the `printf` statement executed? Briefly explain (up to 3 sentences).

**Part a**

```c
int i, j;
int n = 100;
for (i = 1; i <= n; i++) {
    for (j = 3*i; j <= n; j++) {
        printf("programming is fun\n");
    }
}
```

**Part b**

```c
int i, j;
int n = 1000000;
for (i = 1; i <= n; i++) {
    for (j = 1; j <= 10000; j++) {
        printf("%d %d\n", i, j);
    }
}
```

**Part c**

```c
int i = 0;
int n = 10;
int j;
while (i < n) {
    i++;
    j = i;
    while (i < n) {
        printf("hello %d\n", i);
        i++;
    }
    i = j;
}
```
Part d

```c
int i = 0;
int n = 10;
int j;

while (i < n) {
    i++;
    j = i;
    while (i < n) {
        printf("hello %d\n", i);
        i++;
        break;
    }
    i = j;
}
```
Question 4
(10 marks)
Write a function that draws an isosceles triangle of given height using for/while loop.

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<thead>
<tr>
<th>Sample input 1:</th>
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<tbody>
<tr>
<td>3</td>
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<th>Sample output 1:</th>
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