Fall 2013 GNG 1106 B Midterm

- The exam runs for 80 minutes and the full mark is 100 points.
- Closed book, with non-programmable calculator is allowed.
- **Write your name and student number on the cover page of the exam paper. Answer each question in the blank space in the exam paper under each question. Ask for a booklet to write your answers only if the space in the exam paper is not enough, in which case you must also put your name and student number on the cover of the booklet. Submit the exam paper back, and the exam booklet, if you have used it.**

Your Name:

Your Student Number:

Question 1 (8 points $\times$ 3 = 24 points) *For each of the following code segments, check if it has the correct* **syntax**. *If not, correct it.*

1.
```
int x, myFloat;
```

2.
```
int x, myFloat=0;
```

3.
```
int x=0;
scanf("%d", x);
```

,

Question 2 (10 points) *What will be printed by the following code?*

```
#include <stdio.h>

int main(void)
{
        int x=1, y=2, z=3;
        printf("x=%d, y=%d, z=%d\n", x, y, z);
        y=z;
        z=x;
        x=y;
        printf("x=%d, y=%d, z=%d\n", x, y, z);
        return 0;
}
```

Question 3 (14 points) *What will be printed by the following code?*

```
#include <stdio.h>

int jack(int a, int b)
{
        int tmp;
        tmp=a;
        a=b;
        b=tmp;
        return tmp-a;
}


int jackCaller(int a, int b)
{
        int tmp;
        tmp=jack(a, b);
        printf("a=%d, b=%d\n", a, b);
        return tmp;
}


int main(void)
{
        int a=30;
        int b=5;
        int c;

        c=jack(a, b);
        printf("a=%d, b=%d, c=%d\n", a, b , c);
        a=jack(b, c);
        printf("a=%d, b=%d, c=%d\n", a, b , c);
        printf("The output is %d\n", jackCaller(a, jackCaller(b, c)));
        return 0;

}
```

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Question 4 (20 points) *Implement a function with the following prototype*

void printBinaryRepresentationOfInteger(int a);

The function, when called, is to print a sequence of 8 binary values (0's and 1's) that is the binary representation of integer a that is between 0 and 255. For example, when calling the function by void printBinaryRepresentationOfInteger(7)*, it prints "00000111"; when calling the function by* void printBinaryRepresentationOfInteger(9)*, it prints "00001001". To be more precise, every integer x in the range from 0 to 255 can be represented as*

$$x = b_7 2^7 + b_6 2^6 + b_5 2^5 + b_4 2^4 + b_3 2^3 + b_2 2^2 + b_1 2^1 + b_0 2^0;$$

The function, when calling with a=x, essentially prints the sequence of numbers $b_7, b_6, b_5, b_4, b_3, b_2, b_1, b_0$.

NOTE: you are required to implement this function using loop or recursion. You will loose marks if you use other methods to implement the function, even if your implementation is correct.

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Question 5 (14 points) *What will be printed by the following code?*

```
#include <stdio.h>

int abc(int x)
{
        static int y=0;
        y=y+x/3;
        printf("in abc: x=%d, y=%d\n", x, y);
        return y;
}

int main(void)
{

        int x=33;

        while(1)
        {
                x=x-abc(x);
                printf("in main: x=%d\n", x);
                if (x<=0)
                        break;
        }

        return 0;
}
```

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Question 6 (18 points) *What will be printed by the following code?*

```
#include <stdio.h>

void haha(int x)
{
        double tmp;
        tmp= (double) x/2;

        printf("At a T intersection\n");

        if (x<=0)
                printf("Stop\n");
        else
        {
                if (tmp!= x/2)
                {
                        printf("make left turn\n');
                        haha(x-5);
                }
                else
                {
                        printf("make right turn\n");
                        haha(x-7);
                }

        }
}

int main(void)
{
        haha(28);
        return 0;
}
```

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