Full Name:_____

A-number:_____

ECE 5720, Fall 2020

Take Home 1

Due: September 15, 2020 (3:00 PM)

Instructions:

- Write your A-number on top of every sheet.
- Make sure that your exam is not missing any sheets, then write your full name on the front.
- The exam has a maximum score of 20 points. You must show your steps clearly to get any credit. Good luck!

1 (10):	
2 (10):	
TOTAL (20):	

Problem 1. (10 points):

Condider the following assembly code for a C `for` loop:

```
loop:
        movslq        %esi, %rsi
        leaq         -1(%rdi,%rsi), %rax
        cmpq          %rax, %rdi
        jnb          .L1
.L5:
        movzbl          (%rax), %edx
        subq          $1, %rax
        addb          (%rdi), %dl
        movb          %dl, (%rdi)
        xorb          1(%rax), %dl
        movb          %dl, 1(%rax)
        xorb          %dl, (%rdi)
        addq          $1, %rdi
        cmpq          %rax, %rdi
        jb          .L5
.L1:
        rep ret
```

Based on the assembly code above, fill in the blanks below in its corresponding C source code. (Note: you may only use the symbolic variables `h`, `t` and `len` in your expressions below — *do not use register names.*)

```
void loop(char *h, int len)
{
   char *t;

   for (_______________; _____________; h++,t--) {

      ___________________;

      ___________________;

      ___________________;
   }

   return;
}
```

Problem 2. (10 points):

Condider the following assembly code for a C `for` loop:

```
decode_me:
        cmpl        %esi, %edi
        jle        .L4
        movl        %edi, %edx
        movl        $1, %eax
        subl        %esi, %edx
.L3:
        subl        $1, %edi
        addl        $1, %esi
        imull        %edx, %eax
        subl        $2, %edx
        cmpl        %esi, %edi
        jg        .L3
        rep ret
.L4:
        movl        $1, %eax
        ret
```

Based on the assembly code above, fill in the blanks below in its corresponding C source code. (Note: you may only use the symbolic variables `x`, `y`, and `result` in your expressions below — *do not use register names.*)

```
int decode_me(int x, int y)
{
   int result;

   for (_____________; _____________; x--,y++ ) {

      ___________;

   }


   return result;
}
```