

**CSI 465 Compiler Design**  
**LAB 6: Nested Structures**

Objectives:

- a) Understand how nesting various structures are implemented in assembly language.
- b) Understand the interrelationship of for loops, while loops, and if-else statements.

1) Exercises:

- a) Type the following code in a program in Frances.

```
int x =1, y =0;
while( x <9)
    if( x > 5)
        x = x*2;
    else
        x = x+1;
```

- i) Write the assembly code associated with each line next to the line.
- ii) Explain exactly what is occurring in this assembly code.
- iii) Is this what you expected? Why or why not?

- b) Type the following code in a program in Frances.

```
int x = 1, y = 0;
if(x > 5)
    while(x < 9)
        x = x+1;
```

- i) Write the assembly code associated with each line next to the line.
- ii) How does this differ from the nesting the conditional in the loop?
- iii) Is this what you expected? Why or why not?

- c) Type the following code in a program in Frances.

```
int x =1, y =0;
for(y=3; y<7; ++y)
    while(x < 9)
        x = x+1;
```

- i) Write the assembly code associated with each line next to the line.
- ii) Explain exactly what is occurring in this assembly code.
- iii) Is this what you expected? Why or why not?

- d) Type the following code in a program in Frances.

```
int x = 1, y = 0;
while(x < 9)
    for(y=3; y<7; ++y)
        x = x+1;
```

- i) How does the assemble code differ from the previous example?

e) Type the following code in a program in Frances.

```
int x = 0, y = 0, z = 0;
for(x=1; x<3; ++x)
    for(y=2; y<5; ++y)
        for(z=3; z<7; ++z)
            x = x+1;
```

i) Write the assembly code associated with each line next to the line.