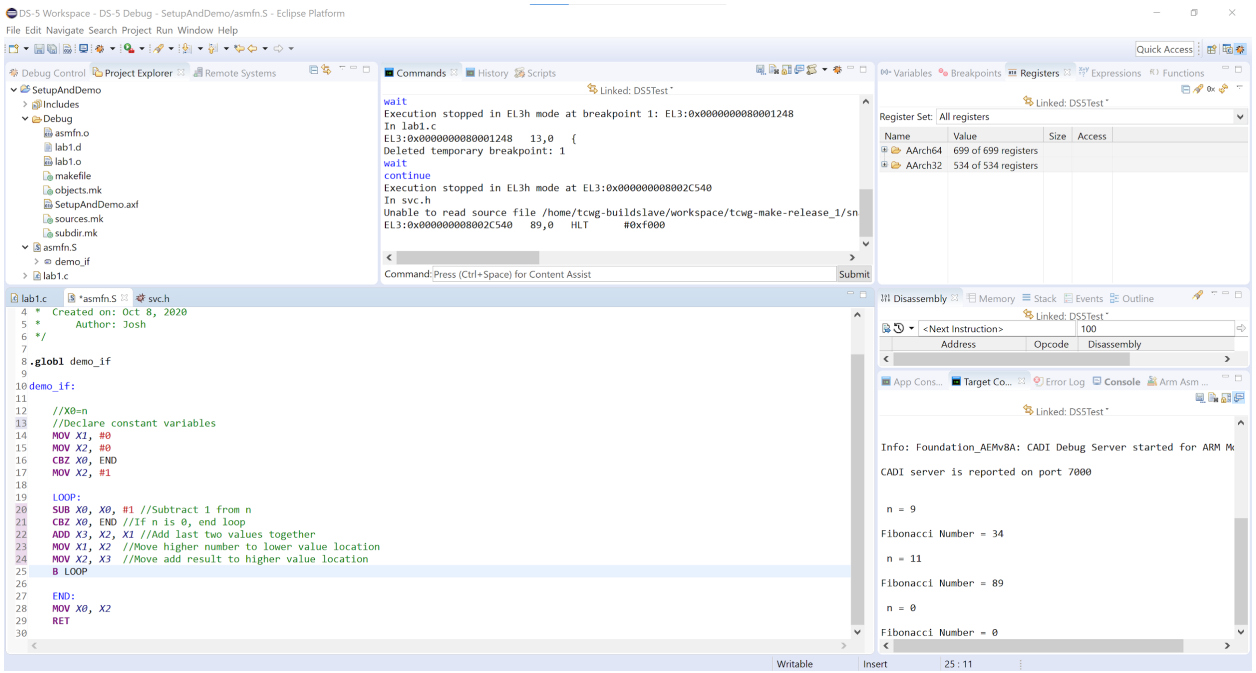
C Code

```c
#include<stdio.h>

extern int demo_if(int n);

int main()
{

    int n = 9;
    printf("\n n = %d", n);
    printf("\nFibonacci Number = %d" ,demo_if(n));

    n = 11;
    printf("\n n = %d", n);
    printf("\nFibonacci Number = %d" ,demo_if(n));

    n = 0;
    printf("\n n = %d", n);
    printf("\nFibonacci Number = %d" ,demo_if(n));
    return(0);
}
```

Assembly Code

```
.globl demo_if

demo_if:

    //X0=n
    //Declare constant variables
    MOV X1, #0
    MOV X2, #0
    CBZ X0, END
    MOV X2, #1

    LOOP:
    SUB X0, X0, #1 //Subtract 1 from n
    CBZ X0, END //If n is 0, end loop
    ADD X3, X2, X1 //Add last two values together
    MOV X1, X2  //Move higher number to lower value location
    MOV X2, X3  //Move add result to higher value location
    B LOOP

    END:
    MOV X0, X2
    RET
```

Full Screen



Output

```
 n = 9

Fibonacci Number = 34

 n = 11

Fibonacci Number = 89

 n = 0

Fibonacci Number = 0
```

Variables used :

n - number in fibonacci sequence wanted

Registers used:

X0 - n, and final return value

X1, X2 - most recent two numbers in sequence

X3 - used for addition of X1 and X2

Function Addresses

```
2      .init                          0x00000000000... 0x00000000800... 52              SHT_PROGBITS      SHF_ALLOC+SHF_EXECINSTR
```

```
demo_if
        0x0000000080001218:     MOV     x1, #0x0
        0x000000008000121C:     MOV     x2, #0x0
        0x0000000080001220:     CBZ     x0, 0x80001240
        0x0000000080001224:     MOV     x2, #0x1
LOOP
        0x0000000080001228:     SUB     x0, x0, #0x1
        0x000000008000122C:     CBZ     x0, 0x80001240
        0x0000000080001230:     ADD     x3, x2, x1
        0x0000000080001234:     MOV     x1, x2
        0x0000000080001238:     MOV     x2, x3
        0x000000008000123C:     B       0x80001228
END
        0x0000000080001240:     MOV     x0, x2
        0x0000000080001244:     RET
main
        0x0000000080001248:     STP     x29, x30, [sp, #-0x20]!
        0x000000008000124C:     MOV     x29, sp
```