Koç University
Comp201

Lab Exercise 6

In this exercise, you are expected to understand assembly code. You will also be required to answer a few questions that you will answer as a comment in your main.c file.

Type your name at the top of your main.c file as a comment.

1. Consider assembly code given here: https://godbolt.org/z/ozG113
   a. What happens in the lines 4, 5 and 6 of the assembly code?
   b. Why does the compiler move 1 to DWORD PTR [rbp-8] in line 13?

2. Understand the following assembly language code and implement the equivalent function "someFunction" in the main.c file.

```
someFunction:
        push    rbp
        mov     rbp, rsp
        mov     DWORD PTR [rbp-20], edi
        mov     eax, DWORD PTR [rbp-20]
        add     eax, 2
        mov     DWORD PTR [rbp-8], eax
        mov     DWORD PTR [rbp-4], 1
        cmp     DWORD PTR [rbp-20], 3
        jle     .L2
        mov     eax, DWORD PTR [rbp-20]
        sub     eax, 2
        mov     DWORD PTR [rbp-4], eax
.L2:
        mov     eax, DWORD PTR [rbp-8]
        imul    eax, DWORD PTR [rbp-4]
        mov     DWORD PTR [rbp-12], eax
        add     DWORD PTR [rbp-12], 27
        mov     eax, DWORD PTR [rbp-12]
        pop     rbp
        ret
```

3. Understand the following assembly language code and implement the equivalent function “distsq” in the main.c file.

```
distsq:
        push    rbp
        mov     rbp, rsp
        mov     DWORD PTR [rbp-4], edi
        mov     DWORD PTR [rbp-8], esi
        mov     eax, DWORD PTR [rbp-4]
        imul    eax, eax
        mov     DWORD PTR [rbp-4], eax
        mov     eax, DWORD PTR [rbp-8]
        imul    eax, eax
        mov     DWORD PTR [rbp-8], eax
        mov     edx, DWORD PTR [rbp-4]
        mov     eax, DWORD PTR [rbp-8]
        add     eax, edx
        pop     rbp
        ret
```

4. What is the use of the distsq() function or what can its output be interpreted as?
   Hint: Read the name of the function.