

EXERCISE

1. Write a macro to subtract two numbers.

SOURCE CODE

```
#CODE CREATED BY TAMIA NAEEM CTAI-004
.data
msg1 : .asciiz"Enetr the first number : "
msg2 : .asciiz"Enetr the second number : "
output: .asciiz"output : "

.text
.globl main

.macro subtract (%val1,%val2)
move $t3,%val1

move $t4,%val2

sub $t5,$t3,$t4

li $v0,4
la $a0,output
syscall

li $v0,1
move $a0,$t5
syscall

.end_macro
```

```
27  main:
28
29  li $v0,4
30  la $a0,msg1
31  syscall
32
33  li $v0,5
34  syscall
35  move $t0,$v0
36
37  li $v0,4
38  la $a0,msg2
39  syscall
40
41  li $v0,5
42  syscall
43  move $t1,$v0
44
45  subtract($t0,$t1)
```

OUTPUT

```
Enetr the first number : 10
Enetr the second number : 4
output : 6
```

2. Write a macro to multiply two numbers.

SOURCE CODE

```
1  #CODE CREATED BY TAMIA NAEEM CTAI-004
2  .data
3  msg1 : .ascii"Enetr the first number : "
4  msg2 : .ascii"Enetr the second number : "
5  output: .ascii"output : "
6
7  .text
8  .globl main
9
10 .macro multiply (%val1,%val2)
11     move $t3,%val1
12
13     move $t4,%val2
14
15     mul $t5,$t3,$t4
16
17     li $v0,4
18     la $a0,output
19     syscall
20
21     li $v0,1
22     move $a0,$t5
23     syscall
24
25 .end_macro
```

```
26
27  main:
28
29  li $v0,4
30  la $a0,msg1
31  syscall
32
33  li $v0,5
34  syscall
35  move $t0,$v0
36
37  li $v0,4
38  la $a0,msg2
39  syscall
40
41  li $v0,5
42  syscall
43  move $t1,$v0
44
45  multiply($t0,$t1)
```

OUTPUT:

```
Enetr the first number : 6
Enetr the second number : 5
output : 30
-- program is finished running (dropped off bottom) --
```

3. Write a macro to print an integer value.

SOURCE CODE

```

1  #CODE CREATED BY TAMIA NAEEM CTAI-004
2  .data
3  msg : .asciiz"Enter value : "
4  output: .asciiz "you Entered : "
5  .text
6  .globl main
7  .macro print(%val)
8
9  li $v0,4
10 la $a0,output
11 syscall
12
13 move $a0,%val
14 li $v0,1
15 syscall
16 .end_macro
17 main:
18 li $v0,4
19 la $a0,msg
20 syscall
21
22 li $v0,5
23 syscall
24 move $t0,$v0
25 print($t0)|

```

OUTPUT:

```

Enter value : 4
you Entered : 4
-- program is finished running (dropped off bottom) --

```

4. Create a macro that saves and restores a register.

SOURCE CODE

```
#CODE CREATED BY TAMIA NAEEM CTAI-004
.data
msg1 : .asciiz"Enetr the first number : "
msg2 : .asciiz"Enetr the second number : "
output: .asciiz"output : "
remsg1 : .asciiz"\nThe first value was : "
remsg2 : .asciiz"\nThe second value was : "

.text
.globl main

.macro store_and_reuse (%val1,%val2)
move $t3,%val1
move $t4,%val2

sub $t5,$t3,$t4

li $v0,4
la $a0,output
syscall

li $v0,1
move $a0,$t5
syscall
```

```
27  li $v0,4
28  la $a0,remsg1
29  syscall
30
31  li $v0,1
32  move $a0,$t3
33  syscall
34
35  li $v0,4
36  la $a0,remsg2
37  syscall
38
39  li $v0,1
40  move $a0,$t4
41  syscall
42  .end_macro
43
44
45  main:
46
47  li $v0,4
48  la $a0,msg1
49  syscall
50
51  li $v0,5
52  syscall
53  move $t0,$v0
```

```
55  li $v0,4
56  la $a0,msg2
57  syscall
58
59  li $v0,5
60  syscall
61  move $t1,$v0
62
63  store_and_reuse($t0,$t1)
```

OUTPUT:

```
Enetr the first number : 45
Enetr the second number : 33
output : 12
The first value was : 45
The second value was : 33
-- program is finished running (dropped off bottom) --
```


5. Write a macro to load an address into a register.

SOURCE CODE

```
#CODE CREATED BY TAMIA NAEEM CTAI-004
.data
msg : .asciiz "HELLO ITS ME TAMIA NAEEM "

.text

.globl main
.macro load_address(%reg, %arg)
la %reg,%arg
.end_macro

main:

load_address($a0,msg)

li $v0,4
syscall
```

OUTPUT:

```
HELLO ITS ME TAMIA NAEEM
-- program is finished running (dropped off bottom) --
```