



University of Central Punjab

(Incorporated by Ordinance No. XXIV of 2002 promulgated by Government of the Punjab)

FACULTY OF INFORMATION TECHNOLOGY

Example for returning value from a function.

```
[org 0x100]
jmp start
addme:
push bp
mov bp,sp
pusha

mov ax,[bp+4]
mov bx,[bp+6]
add ax,bx
mov [bp+8],ax ;write the value at the reserved location.

popa
pop bp
ret 4; n*2 => where n is the number of parameters passed initially.

start:
push word 0;space reserved for returning value
push word [num1]
push word [num2]
call addme
pop word [result];when function returns the value at the head on stack will be
our final result.
mov ax,0x4c00
int 21h
num1: dw 100
num2: dw 50
result: dw 0
```



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Example to calculate a factorial of a value using recursion.

```
jmp start
fact:
push bp
mov bp,sp
pusha
mov ax,[bp+4]
cmp ax,1;base case
jne continue
mov word [bp+6],1
popa
pop bp
ret 2
```

```
continue:
push word 0
mov bx,ax
dec bx
push bx
call fact
pop bx
mul bx
mov [bp+6],ax
popa
pop bp
ret 2
```

```
start:
push word 0
push word 5
call fact
pop cx
```

```
mov ax,0x4c00
int 21h
```

```
int a = 1;
int b = N;
do {
    a = a * b;
    b = b - 1;
} while (b != 0)
```

```
initially:      a =  1, b = 5
after iter 1:   a =  5, b = 4
after iter 2:   a = 20, b = 3
after iter 3:   a = 60, b = 2
after iter 4:   a = 120, b = 1
after iter 5:   a = 120, b = 0
Done!
```



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TASK 1:

- a) Make a separate subroutine to find the length of a string.
- b) Write a subroutine which will encrypt a string according to a value passed as a parameter.

Encrypt(string,value)

Array[i]=Array[i]+(value)

.....

Let string is :

Array: db 'A quick brown fox jumps over the lazy dog.',0

Value: db 5

After execution:

Array: db 'F.....'

- c) Make another subroutine which will calculate and returns the number of consonants (not a vowel) from part b.



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Task 2:

Write a ***single subroutine*** which will copy one string to another in reverse order.

Use recursion approach to code this problem. (***Function must return 1 character at a time*** and then copy it into the second string.)

Hint: Find null(0) as a base case.

Let :

String1: db 'Hello World!',0

String2: times 50 db 0

After execution:

String2: db '!dlroW olleH',0