

## Laboratory 7b

Title of the Laboratory Exercise: String manipulation

### 1. Introduction and Purpose of Experiment

Students will be able to perform all string manipulations in assembly language

### 2. Aim and Objectives

Aim

To develop assembly language program to perform all string operations like inserting a byte, deleting a byte and copying a string as a sub-string

Objectives

At the end of this lab, the student will be able to

- Identify instructions for performing string manipulation
- Use indexed addressing mode
- Apply looping instructions in assembly language
- Use data segment to represent arrays

### 3. Experimental Procedure

1. Write algorithm to solve the given problem
2. Translate the algorithm to assembly language code
3. Run the assembly code in GNU assembler
4. Create a laboratory report documenting the work

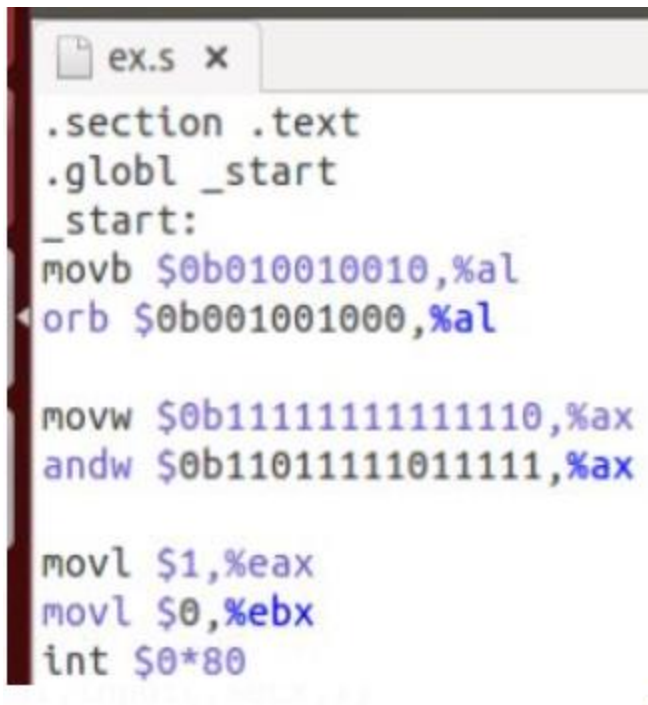
### 4. Questions

Develop an assembly language program to

- a. Set 3<sup>rd</sup> and 6<sup>th</sup> bit high in given 8-bit binary number.
- b. Set 5<sup>th</sup> and 11<sup>th</sup> bit low in given 16-bit binary number.

Develop an assembly language program to replace second and last but one character with 'A'.

### 5. Calculations/Computations/Algorithms



```

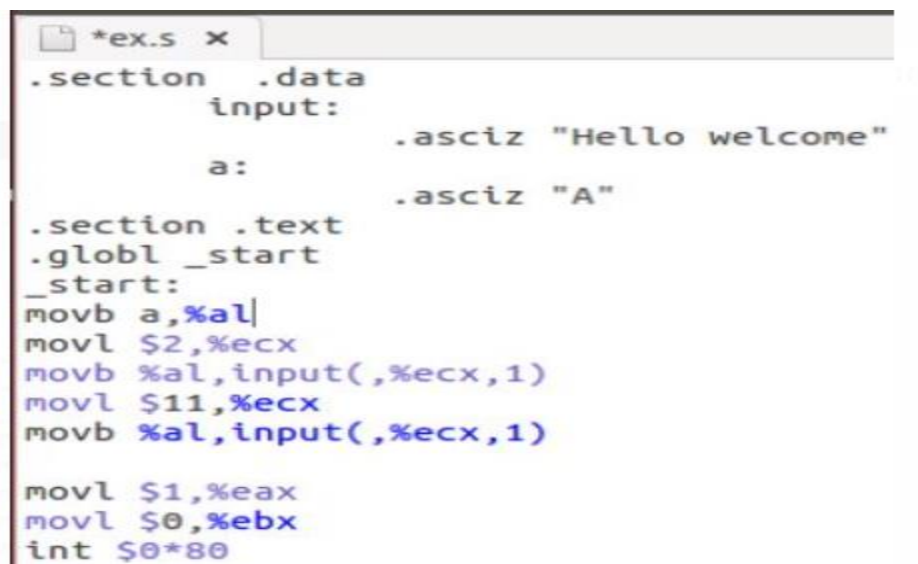
ex.s x
.section .text
.globl _start
_start:
movb $0b010010010,%al
orb $0b001001000,%al

movw $0b11111111111110,%ax
andw $0b11011111011111,%ax

movl $1,%eax
movl $0,%ebx
int $0*80

```

Fig 1 program to Set 3<sup>rd</sup> and 6<sup>th</sup> bit high in given 8-bit binary number and Set 5<sup>th</sup> and 11<sup>th</sup> bit low in given 16-bit binary number.



```

*ex.s x
.section .data
    input:
        .asciz "Hello welcome"
    a:
        .asciz "A"

.section .text
.globl _start
_start:
movb a,%al
movl $2,%ecx
movb %al,input(,%ecx,1)
movl $11,%ecx
movb %al,input(,%ecx,1)

movl $1,%eax
movl $0,%ebx
int $0*80

```

Fig 2 program to Develop an assembly language program to replace second and last but one character with 'A'.

## 6. Presentation of Results



Fig 3 result of program to Set 3<sup>rd</sup> and 6<sup>th</sup> bit high in given 8-bit binary number and Set 5<sup>th</sup> and 11<sup>th</sup> bit low in given 16-bit binary number.

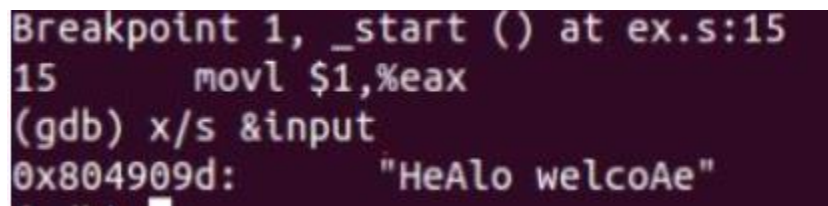


Fig 4 result of 2 program to Develop an assembly language program to replace second and last but one character with 'A'.

#### 1. Conclusions

Specific character can be searched in a string using the scas instruction which stands for string scan.

Elements from an array can be searched using a simple loop and incrementing the current element counter, once found the flag register is updated and the loop is broken.

#### 2. Comments

##### 1. Limitations of Experiments

The string search algorithm is only application for searching for a character in a string, it cannot be used to search for matching a substring in a string.

##### 2. Limitations of Results

When comparing the character of strings, the flag register cannot be checked if using the rep instruction, hence the results are limited to only checking for equality of characters.

##### 3. Learning happened

Ways to search for an element in an array was learnt along with searching for a character in a string.

##### 4. Recommendations

When testing the program for searching a character in a string, make sure that the search key is of length 1

Signature and date

Marks

