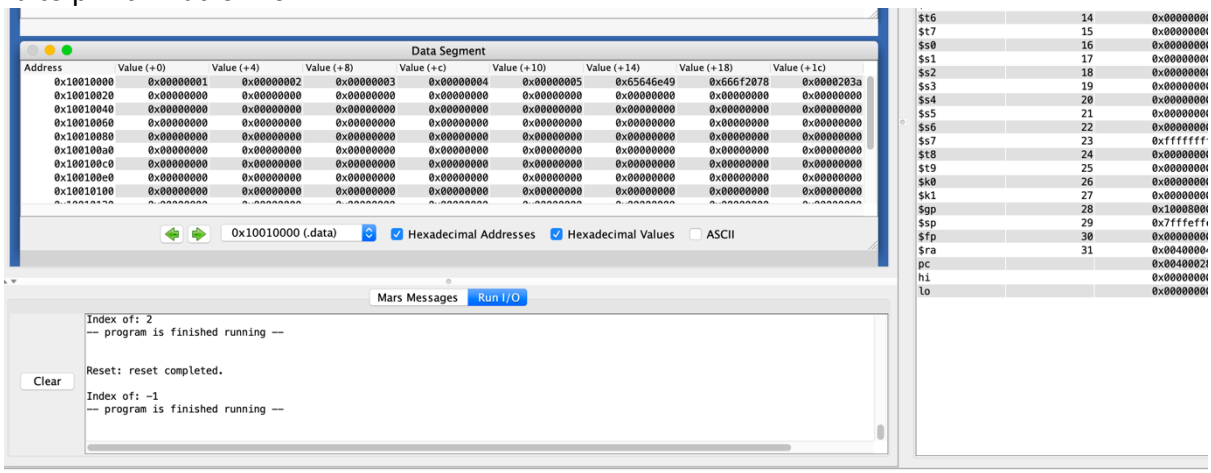
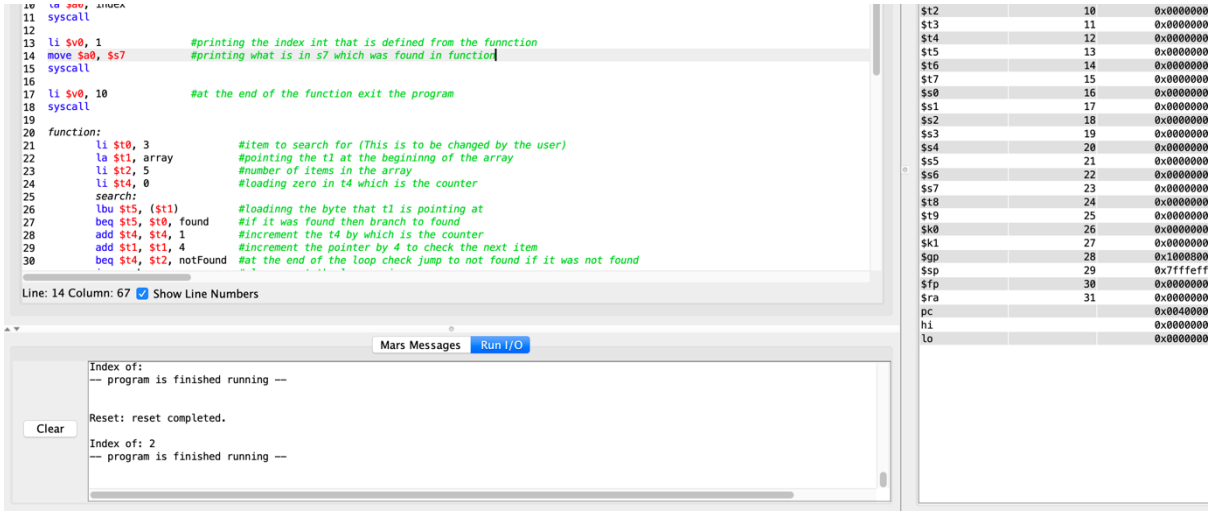
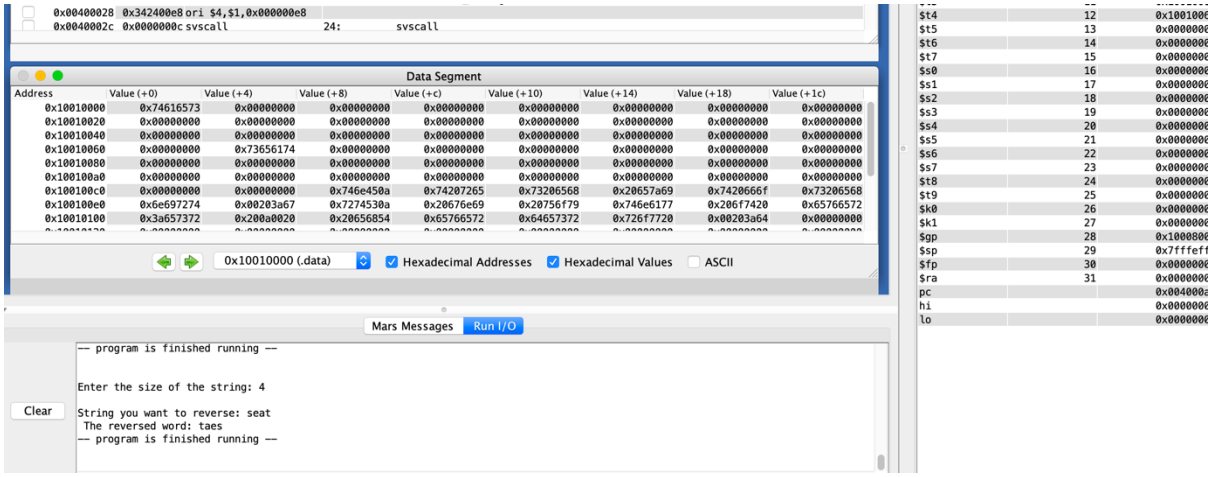
Problem 1:

In this problem we were asked to search for an element and print the index, else -1. What I've done is the function only which was what the question asked for. The array contains 5 elements for example from 1-5. The t0 is to be set to change the item to search for. This is assuming that this function would be used in a custom program. I have the main label and the function label, with jal to function to have the ra set to the printing instruction after that and then exit the program. The function will search by incrementing the pointer of array, and checks if it was found. If it was found then the s7 register is set to the index, and jr the ra to print what is in s7.

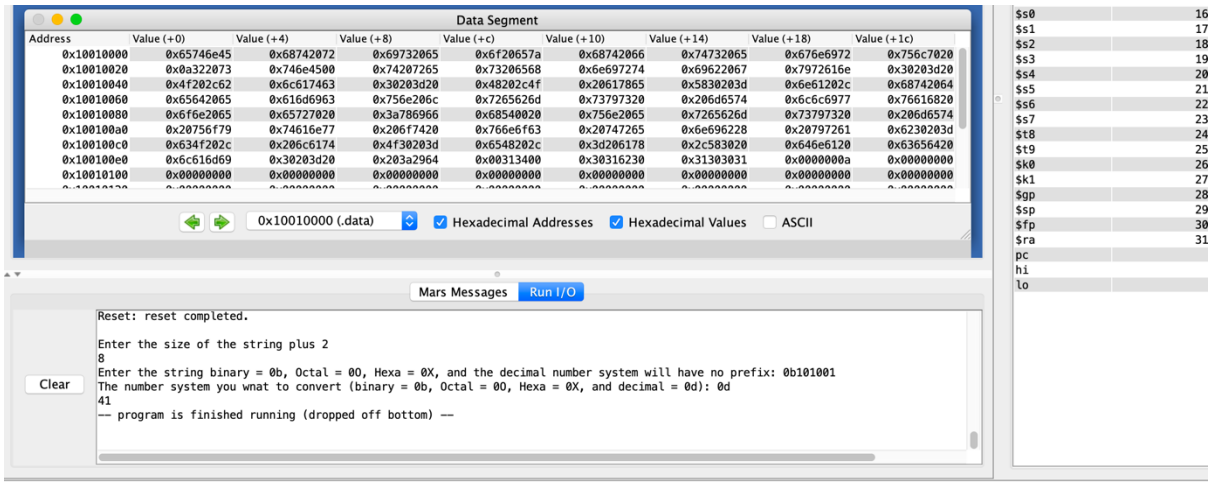


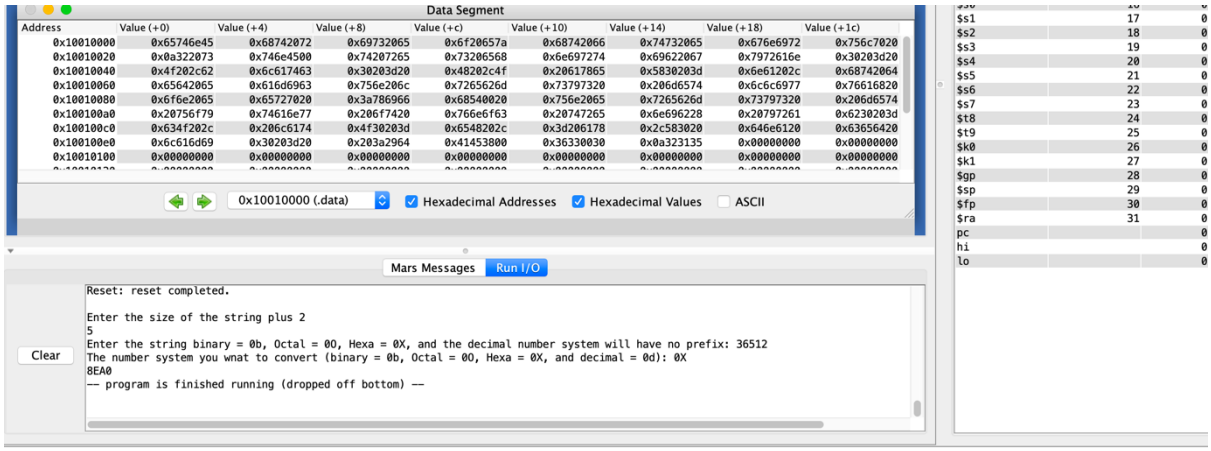


Problem 2:
In this problem, I simply had a pointer to the beginning of the string entered. I also reserved space for another string to be storing the reverse. I set the pointer of the second string to the end. In a loop, I load the byte in the first pointer of the first string, and then I store its item in the other pointer of the second string. I increment the pointer of the first string and decrement the second pointer, until the pointer points to zero, then print the reversed string.



Problem 3:
In this problem, I made the conversion into 6 main function to convert from a number to another, instead of 12. I made any number entered converted to a decimal number. This decimal number is then converted to binary or hexa or octal based on the user's desired input. First of all I retrieve the user input size which is very important in my program to keep looping over the string plus which makes in consideration the two bytes for the prefixes. This string is parsed from the beginning and checked if it contains b, O, or X in their second element in the string. The handlers are activated based in the that, otherwise it goes to the decimal handler immediately. The handlers makes the string ready to enter the decimal conversion function by increasing the pointer and decreasing to the size. After the number goes to the decimal conversion, the user is then asked to enter the prefix related to the desired conversion. The conversion is made through the check1 function and goes to either binary, or octal, or hexa functions. After the conversion is made the result is stored in the bin_string, or octal_string, or hexa_string, or dec_string, and then printed. The conversion from the number to another was made by parsing the string and then loading them into registers which are then compared with their appropriate signs. The hexa letter are translated into their equivalent ascii numbers such that is works. **We assumed the user is entering the exact numbers as the characters in the string, otherwise the program will go into an infinite loop.** The conversion from the number to another was made by parsing the string and then loading them into registers which are then compared with their appropriate signs.


Data Segment
Address Value (+0) Value (+4) Value (+8) Value (+c) Value (+10) Value (+14) Value (+18) Value (+1c)
0x10010000 0x65746e45 0x68742072 0x69732065 0x6f20657a 0x68742066 0x74732065 0x676e6972 0x756c7020
0x10010020 0x0a322073 0x746e4500 0x74207265 0x73206568 0x6e697274 0x69622067 0x7972616e 0x30203d20
0x10010040 0x4f202c62 0x6c617463 0x30203d20 0x48202c4f 0x20617865 0x5830203d 0x6e61202c 0x68742064
0x10010060 0x65642065 0x616d6963 0x756e206c 0x7265626d 0x73797320 0x206d6574 0x6c6c6977 0x76616820
0x10010080 0x6f6e2065 0x65727020 0x3a786966 0x68540020 0x756e2065 0x7265626d 0x73797320 0x206d6574
0x100100a0 0x20756f79 0x74616e77 0x206f7420 0x766e6f63 0x20747265 0x6e696228 0x20797261 0x6230203d
0x100100c0 0x634f202c 0x206c6174 0x4f30203d 0x6548202c 0x3d206178 0x2c583020 0x646e6120 0x63656420
0x100100e0 0x6c616d69 0x30203d20 0x203a2964 0x00313400 0x30316230 0x31303031 0x0000000a 0x00000000
0x10010100 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x10010000 (.data)
Hexadecimal Addresses
Hexadecimal Values
ASCII
Mars Messages
Run I/O
Clear
Reset: reset completed.
Enter the size of the string plus 2
8
Enter the string binary = 0b, Octal = 0O, Hexa = 0X, and the decimal number system will have no prefix: 0b101001
The number system you wnat to convert (binary = 0b, Octal = 0O, Hexa = 0X, and decimal = 0d): 0d
41
-- program is finished running (dropped off bottom) --
$s0 16
$s1 17
$s2 18
$s3 19
$s4 20
$s5 21
$s6 22
$s7 23
$t8 24
$t9 25
$k0 26
$k1 27
$gp 28
$sp 29
$fp 30
$ra 31
pc
hi
lo


Data Segment
Address Value (+0) Value (+4) Value (+8) Value (+c) Value (+10) Value (+14) Value (+18) Value (+1c)
0x10010000 0x65746e45 0x68742072 0x69732065 0x6f20657a 0x68742066 0x74732065 0x676e6972 0x756c7020
0x10010020 0x0a322073 0x746e4500 0x74207265 0x73206568 0x6e697274 0x69622067 0x7972616e 0x30203d20
0x10010040 0x4f202c62 0x6c617463 0x30203d20 0x48202c4f 0x20617865 0x5830203d 0x6e61202c 0x68742064
0x10010060 0x65642065 0x616d6963 0x756e206c 0x7265626d 0x73797320 0x206d6574 0x6c6c6977 0x76616820
0x10010080 0x6f6e2065 0x65727020 0x3a786966 0x68540020 0x756e2065 0x7265626d 0x73797320 0x206d6574
0x100100a0 0x20756f79 0x74616e77 0x206f7420 0x766e6f63 0x20747265 0x6e696228 0x20797261 0x6230203d
0x100100c0 0x634f202c 0x206c6174 0x4f30203d 0x6548202c 0x3d206178 0x2c583020 0x646e6120 0x63656420
0x100100e0 0x6c616d69 0x30203d20 0x203a2964 0x41453800 0x36330030 0x0a323135 0x00000000 0x00000000
0x10010100 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000
0x10010000 (.data)
Hexadecimal Addresses
Hexadecimal Values
ASCII
Mars Messages
Run I/O
Clear
Reset: reset completed.
Enter the size of the string plus 2
5
Enter the string binary = 0b, Octal = 0O, Hexa = 0X, and the decimal number system will have no prefix: 36512
The number system you wnat to convert (binary = 0b, Octal = 0O, Hexa = 0X, and decimal = 0d): 0X
8EA0
-- program is finished running (dropped off bottom) --
$s1 17 0
$s2 18 0
$s3 19 0
$s4 20 0
$s5 21 0
$s6 22 0
$s7 23 0
$t8 24 0
$t9 25 0
$k0 26 0
$k1 27 0
$gp 28 0
$sp 29 0
$fp 30 0
$ra 31 0
pc 0
hi 0
lo 0