

AT&T i386 IA32 UIUC ECE391 GCC Highlighter & Snippet & Linter

This is the VS Code Extension for UIUC ECE 391, MIT 6.828, and all other AT&T-based i386(IA-32/x86-32) assembly languages. Current VS Code extensions for assembly are mostly industry-oriented, but this extension is designed for college students and researchers in this area.

Features

- Syntax Highlighting.

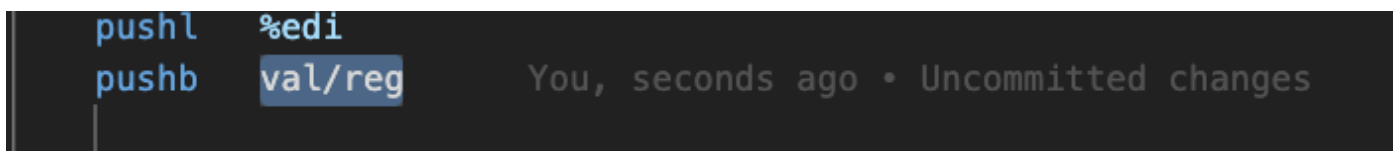
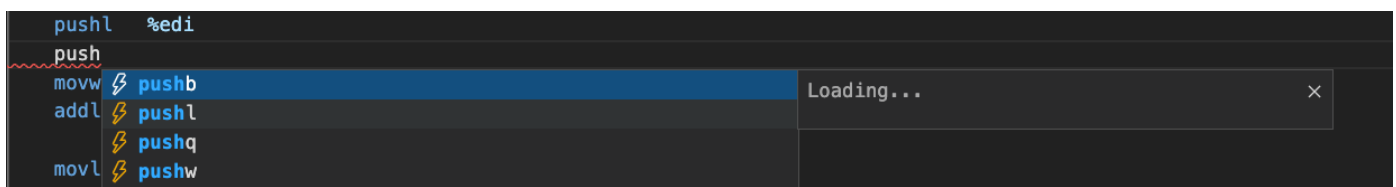
```
# void mp1_poke(void);
#
# Interface: Register-based arguments (not C-style)
#   Inputs: %cl  - The byte you wish to write
#           %eax - Offset from the start of video memory that you wish
#           to write to
#   Outputs: Text-mode video screen is written to at location %eax with
#           the byte in %cl
# Registers: Clobbers EDX
mp1_poke:

movl    vmem_base_addr(,1),%edx
movb    %cl, (%edx,%eax,1)
ret

mp1_rtc_tasklet:
ret

mp1_ioctl:
ret
```

- Self Complete.



- File icons designed for UIUC students.

- Linter line checking.

Memory at both sides of instruction.

```
Two arguments are memory(label) at the same time. Prof. Lumetta blesses you!
illegal.asm(98, 1): You can't use memory for both argument. This is not only slow but also too complicated for a compiler to manage.
View Problem No quick fixes available
movl MEMORY_PLACE_1, MEMORY_PLACE_2 You, seconds ago • Uncommitted changes
```

Code before `.data`, after `.end`, and misplacement of data code and text code.

```
Data in the text section. Prof. Lumetta blesses you!
illegal.asm(103, 1): The compiler can't recognize your data in the code (.text) section. Only put commands here!
View Problem No quick fixes available
.long 1, 2, 3 You, seconds ago • Uncommitted changes
```

```
Instruction before start of program Prof. Lumetta blesses you!
illegal.asm(7, 1): Please double check whether this line is after the .data directive.
View Problem No quick fixes available
pushl %eax
.data
```

Instruction does not exist.

```
Instruction doesn't exist or out of course scope. Prof. Lumetta blesses you!  
illegal.asm(110, 1): pu hme %eax cannot be found in the course handbook.  
View Problem No quick fixes available  
pushme %eax
```

Wrong argument number.

```
The argument number in the instruction is not correct. Prof. Lumetta blesses you!  
illegal.asm(110, 1): The instruction has too many or too few arguments. Return to the course notes!  
View Problem No quick fixes available  
pushl %eax, %ebx
```

The datatype of command does not match the registers.

```
Instruction type different from register type Prof. Lumetta blesses you!  
illegal.asm(97, 1): The instruction pushl does not match the data in their lengths. E.g., movl %ax, %bx is wrong.  
View Problem No quick fixes available  
pushl %ax You, seconds ago • Uncommitted changes
```

Immediate value without '\$'.

```
An immediate number must be led with a $ Prof. Lumetta blesses you!  
illegal.asm(104, 1): All immediate values must have $ at its very beginning. Only for memory displacement can you use a number without $.  
View Problem No quick fixes available  
movl 1000000, %eax
```

Register without '%'

```
An register must be led with a % Prof. Lumetta blesses you!  
illegal.asm(104, 1): All registers must have % at its very beginning.  
View Problem No quick fixes available  
movl eax, %ebx
```

- Linter block checking.

Alignment issues.

```
No alignment in memory Prof. Lumetta blesses you!  
illegal.asm(43, 1): It's strongly recommended to set an alignment before data with more than 2 bytes.  
View Problem No quick fixes available  
.long mp1_ioctl_add, mp1_ioctl_remove, mp1_ioctl_find, mp1_ioctl_sync  
  
| .align 4 You, seconds ago • Uncommitted changes  
function_jump_table:  
    .long mp1_ioctl_add, mp1_ioctl_remove, mp1_ioctl_find, mp1_ioctl_sync
```

```

Alignment type wrong Prof. Lumetta blesses you!
illegal.asm(41, 1): The alignment does not fix in the data type. You should use 2 for short/word, 4 for long, and 8 for quad.
View Problem No quick fixes available
.align 8 You, seconds ago • Uncommitted changes
function_jump_table:
.long mp1_ioctl_add, mp1_ioctl_remove, mp1_ioctl_find, mp1_ioctl_sync

```

Calling issues.

```

mp1_rtc_tasklet:
Enter callee without moving esp to ebp Prof. Lumetta blesses you!
illegal.asm(97, 1): You entered the callee with only pushing ebp but forget to rewrite ebp with the current stack pointer register (esp).
View Problem No quick fixes available
pushl %ebp

```

```

mp1_rtc_tasklet:
Lack of callee-saved registers Prof. Lumetta blesses you!
illegal.asm(97, 1): It's strongly recommended to push these callee-save registers, in case your code work in user space but not kernel space.
View Problem No quick fixes available
pushl %ebp
movl %esp, %ebp

```

```

mp1_rtc_tasklet:
pushl %ebp
movl %esp, %ebp

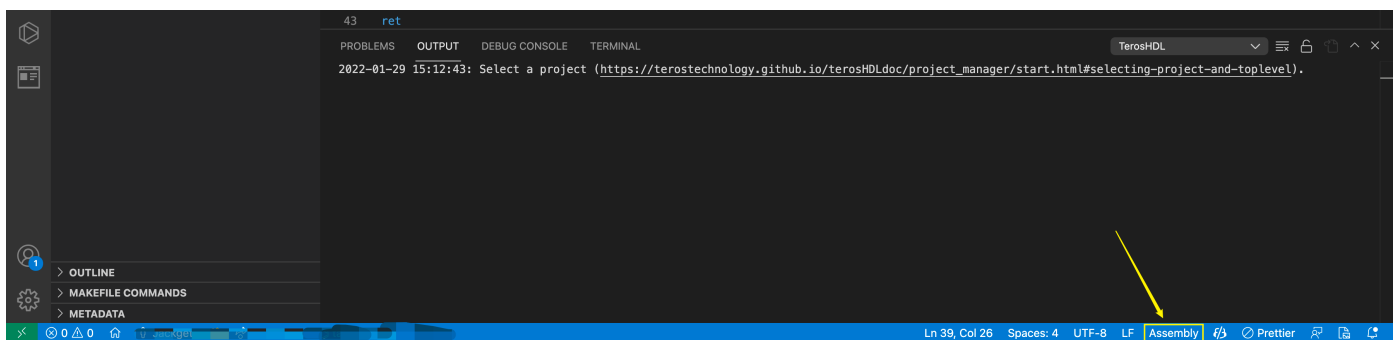
pushl %ebx
pushl %esi

Not all callee-saved registers are saved Prof. Lumetta blesses you!
illegal.asm(103, 1): Oops! It seems that this register is not a standard callee-save register. Please take a check: ebx, edi and esi are the registers to be saved!
View Problem No quick fixes available
pushl %eip

```

Requirements

- To make this extension work, you need to change your source code to `.s` or `.S`.
- Select the language to “AT&T i386 Assembly” using the language change button.



- To use the icon theme, press `shift+ctrl+p` at the same time, then choose `Preferences: File Icon Theme`, then choose `ECE 391 UIUC`.

Known Issues

- No issues hitherto.

Request A Feature

Please contact the author at haob2@illinois.edu.

Release Notes

Please see `./CHANGELOG.md`.