# Lab Report

ECPE 170 – Computer Systems and Networks – Spring 2016

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**Lab Topic:** MIPS Assembly Programming (Basic) (Lab #: 10)

## **Lab Part 1 – Arithmetic**

Int Regs [10]	ðx	Data						ı
<b>PC</b> = 0	6	User data se	gment [100000	00][100400	000]			
$\mathbf{EPC} = 0$		[10000000]	[1003ffff] 0	0000000				
Cause = 0								
BadVAddr = 0								
Status = 8053716	64	User Stack [	7ffff7f4][8	0000000]				
		[7ffff7f4]	0000000003	2147481846	2147481844			
$\mathbf{II} = 0$		[7ffff800]	2147481829	0000000000	2147483625	2147483615		
$\mathbf{W} = 0$		[7ffff810]	2147483600	2147483585	2147483564	2147483535		
-		[7ffff820]	2147483520	2147483512	2147483496	2147483478	x h V	
<b>RO</b> [ <b>rO</b> ] = 0		[7ffff830]	2147483455	2147483408	2147483356	2147483346	?	
RO [10] = 0 R1 [at] = 0		[7ffff840]	2147483286	2147483234	2147483201	2147483147	b A	
$82  [\mathbf{v0}] = 0$		[7ffff850]	2147483129	2147483103	2147483090	2147483071		
2 [v0] = 0 23 [v1] = 0		[7ffff860]	2147483020	2147483002	2147482958	2147482864	z N	
<b>R4</b> [ <b>a0</b> ] = 3		[7ffff870]	2147482849	2147482832	2147482774	2147482743		
R5 [a1] = 2147481	502	[7ffff880]	2147482732	2147482715	2147482689	2147482669	1 [ A	
<b>[a1]</b> = 2147481		[7ffff890]	2147482635	2147482587	2147482539	2147482523		
[a2] = 214/401 $[a3] = 0$	600	[7ffff8a0]	2147482505	2147482472		2147482351	h 3	
R8 [t0] = 0		[7ffff8b0]	2147482340	2147482322		2147482285		
R9 [t1] = 0		[7ffff8c0]	2147482217	2147482138	2147482129	2147482106	i	
R10 [t2] = 0		[7ffff8d0]	2147482024	2147481959		2147481898	q D *	
R10 [t2] = 0 R11 [t3] = 0		[7ffff8e0]		1769095424		0778266996	Arithmetic.	
R12 [t4] = 0		[7ffff8f0]		1747910705	0795176303	2003137124	asm.1./home/drew	
		[7ffff900]		1801680226	0841970789		/bitbucket/2016	
R13 [t5] = 0		[7ffff910]		1700751214		1815031863	spring_ecpe170/1	
R14 [t6] = 0 R15 [t7] = 0		[7ffff920]	0808542817		1329791092		ab10/Part.COMPIZ	
R15 [E7] = 0 R16 [s0] = 0		[7ffff930]	1313423967			1647276659	_ B I N _ P A T H = / u s r / b	
R16 [SU] = 0 R17 [S1] = 0		[7ffff940]		1599031623		1145391171	in/.GIO_LAUNCHED	
R17 [S1] = 0 R18 [S2] = 0		[7ffff950]	1397048415			1230004037	_ D E S K T O P _ F I L E _ P I	
R19 [s3] = 0		[7ffff960]	0842218820	1191194674	1281314633	1129207105	D = 3 2 2 0 . G I O _ L A U N C	
		[7ffff970]		1263748420	1599098708	1162627398	HED_DESKTOP_FILE	
R20 [s4] = 0 R21 [s5] = 0		[7ffff980]		1752379250	0795177569		= / usr/share/appl	
		[7ffff990]		1936617321		0778922352	ications/qtspim.	
<b>R22</b> [ <b>s6</b> ] = 0		[7ffff9a0]	1802724708			1598967625	desktop.SESSION_	
R23 [s7] = 0		[7ffff9b0]	1095647565			1651847020	MANAGER = local/ub	
R24 [t8] = 0		[7ffff9c0]	1970564725	1949253690			untu:@/tmp/.ICE-	
R25 [t9] = 0		[7ffff9d0]	2020175477			1966045289	unix/1894, unix/u	
R26 [k0] = 0		[7ffff9e0]			0774860909		buntu:/tmp/.ICE-	
$\mathbf{R27}  [\mathbf{k1}] = 0$		//			2.74000000	0.00010020	2 2 11 2 4 1 / 2 11 P / 1 1 0 D	

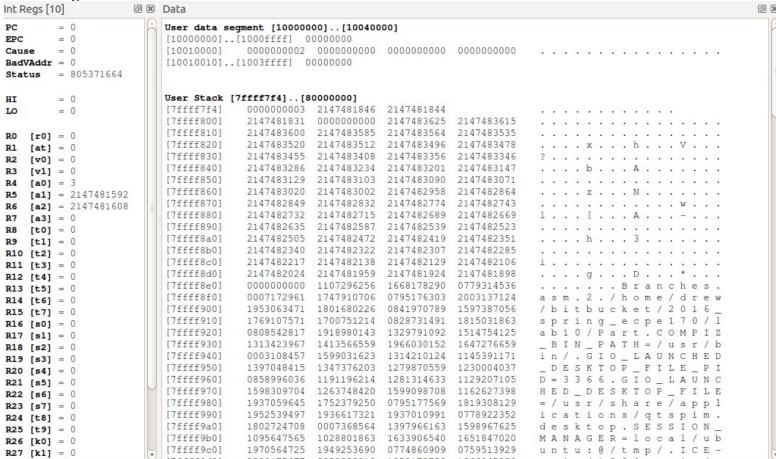
nt Regs [10]	ð X	Data						6
ec = 419442	20	User data se		00][100400	00]			
$\mathbf{PC} = 0$		[10000000].	.000ffff	20000				
ause = 0		[10010000]	000000033	10000000	0000000000	000000000	1	
adVAddr = 0		[10010010].	1003ffff] 0	0000				
<b>tatus</b> = 805371	1664							
<b>I</b> = 0		User Stack [	7ffffr/14][8	0000000]				
<b>o</b> = 3		[7ffff7f4]	0000000003	2147481846	2147481844			
		[7ffff800]	2147481829	0000000000	2147483625	2147483615		
<b>0</b> [r0] = 0		[7ffff810]	2147483600	2147483585	2147483564	2147483535		
1 [at] = 268500	1992	[7ffff820]	2147483520	2147483512	2147483496	2147483478	x h V	
2 [v0] = 10		[7ffff830]	2147483455	2147483408	2147483356	2147483346	?	
3 [v1] = 0		[7ffff840]	2147483286	2147483234	2147483201	2147483147	b A	
4 [a0] = 3		[7ffff850]	2147483129	2147483103	2147483090	2147483071		
[a3] = 3 [a1] = 214748	R1592	[7ffff860]	2147483020	2147483002	2147482958	2147482864	z N	
[a2] = 214748		[7ffff870]	2147482849	2147482832	2147482774	2147482743		
[a2] = 214/40 [a3] = 0	31000	[7ffff880]	2147482732	2147482715	2147482689	2147482669	1 [ A	
[t0] = 15		[7ffff890]	2147482635	2147482587	2147482539	2147482523		
(t1) = 10		[7ffff8a0]	2147482505	2147482472	2147482419	2147482351	h 3	
lo [t2] = 5		[7ffff8b0]	2147482340	2147482322	2147482307	2147482285		
10 [t2] = 3 11 [t3] = 2		[7ffff8c0]	2147482217	2147482138	2147482129	2147482106	i	
2 [t4] = 18		[7ffff8d0]	2147482024	2147481959	2147481924	2147481898	g D *	
.3 [t5] = -3		[7ffff8e0]	0000000000	1769095424	1701668980	0778266996	Arithmetic.	
.4 [t6] = 5		[7ffff8f0]	0007172961	1747910705	0795176303	2003137124	asm.1./home/drew	
.5 [t7] = 10		[7ffff900]	1953063471	1801680226	0841970789	1597387056	/bitbucket/2016	
.6 [s0] = 33		[7ffff910]	1769107571	1700751214	0828731491	1815031863	spring_ecpe170/1	
.7 [s1] = 0		[7ffff920]	0808542817	1918980143	1329791092	1514754125	ab10/Part.COMPIZ	
8 [s2] = 0		[7ffff930]	1313423967	1413566559	1966030152	1647276659	_ B I N _ P A T H = / u s r / b	
9 [s3] = 0		[7ffff940]	0003108457	1599031623	1314210124	1145391171	in/.GIO_LAUNCHED	
20 [s4] = 0		[7ffff950]		1347376203	1279870559	1230004037	_ DESKTOP _ FILE _ PI	
1 [s4] = 0		[7ffff960]	0842218820	1191194674	1281314633	1129207105	D = 3 2 2 0 . G I O L A U N C	
2 [s6] = 0		[7ffff970]	1598309704	1263748420	1599098708	1162627398	HED_DESKTOP_FILE	
2 [86] = 0 3 [87] = 0		[7ffff980]		1752379250	0795177569	1819308129	= / u s r / s h a r e / a p p l	
3 [s/] = 0 4 [t8] = 21		[7ffff990]	1952539497		1937010991	0778922352	ications/qtspim.	
25 [t9] = 21		[7ffff9a0]	1802724708	0007368564	1397966163	1598967625	desktop.SESSION_	
		[7ffff9b0]		1028801863	1633906540	1651847020	MANAGER = local/ub	
26 [k0] = 0		[7ffff9c01	1970564725	1949253690	0774860909	0759513929	untu: @ / tmp / . I C E -	
27 [k1] = 0		[,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	20004723	104020000	**********	**********		

#### Lab Part 2 – Branches





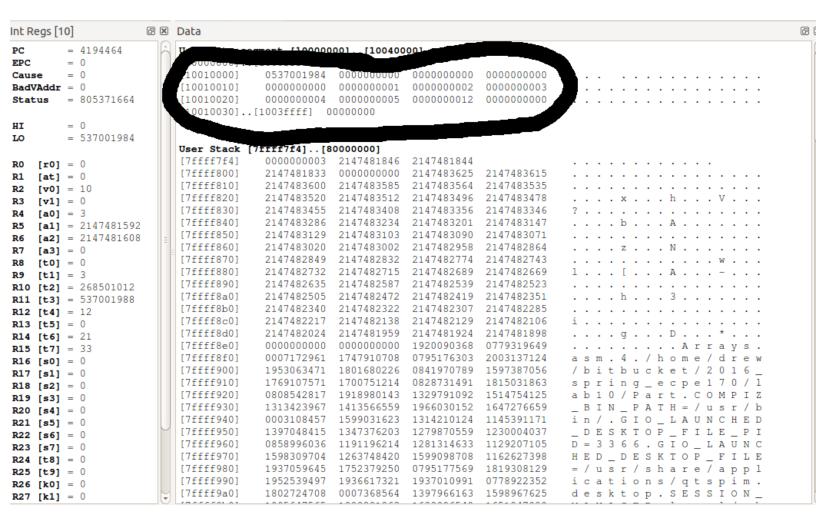
### Lab Part 3 – Loops



t Regs [1	10]	ð X	Data						(
С	= 4194432	A	User data s	ment f		00]			
PC	= 0		[10000000].	LII] 0	0000000				
ause	= 0		[10010000]	0000000077	-1	0000000000	000000000	М	
adVAddr	= 0		[10010010]	1003ffff] 0	0000000	,			
tatus	= 805371664					•			
I I	= 0		User Stack		-1				
)	= 0		[7ffff7f4]	000000000	2147481846	2147481844			
			[7ffff800]	2147481834	0000000000	2147483625	2147483615		
[r0]	= 0		[7ffff810]	2147483600	2147483585	2147483564	2147483535		
	= 268500992		[7ffff820]	2147483520	2147483512	2147483496	2147483478	x h V	
	= 10		[7ffff830]	2147483455	2147483408	2147483356	2147483346	?	
[v1]			[7ffff840]	2147483286	2147483234	2147483201	2147483147	b A	
[a0]			[7ffff850]	2147483129	2147483103	2147483090	2147483071		
	= 2147481592		[7ffff860]	2147483020	2147483002	2147482958	2147482864	z N	
	= 2147481608		[7ffff870]	2147482849	2147482832	2147482774	2147482743		
[a3]		-	[7ffff880]	2147482732	2147482715	2147482689	2147482669	1 [ A	
	= 77		[7ffff890]	2147482635	2147482587	2147482539	2147482523		
	= -1		[7fffff8a0]	2147482505	2147482472	2147482419	2147482351	h 3	
0 [t2]			[7ffff8b0]	2147482340	2147482322	2147482307	2147482285		
1 [t3]			[7ffff8c0]	2147482217	2147482138	2147482129	2147482106	i	
2 [t4]			[7ffff8d0]	2147482024	2147481959	2147481924	2147481898	g D *	
2 [64] 3 [t5]			[7fffff8e0]	0000000000	1107296256	1867276658	0779317359	BraLoops.	
4 [t6]			[7ffff8f0]	0007172961	1747910707	0795176303	2003137124	asm.3./home/drew	
5 [t7]			[7ffff900]	1953063471	1801680226	0841970789	1597387056	/bitbucket/2016_	
6 [s0]			[7ffff910]	1769107571	1700751214	0828731491	1815031863	spring_ecpe170/1	
7 [s1]			[7ffff920]	0808542817	1918980143	1329791092	1514754125	ab10/Part.COMPIZ	
, [31] 8 [s2]			[7ffff930]	1313423967	1413566559	1966030152	1647276659	_ B I N _ P A T H = / u s r / b	
9 [s2]			[7ffff940]	0003108457	1599031623	1314210124	1145391171	in/.GIO_LAUNCHED	
0 [s4]			[7ffff950]	1397048415	1347376203	1279870559	1230004037	_ DESKTOP_FILE_PI	
0 [54] 1 [s5]			[7ffff960]	0858996036	1191196214	1281314633	1129207105	D = 3 3 6 6 . G I O _ L A U N C	
2 [s6]			[7ffff970]	1598309704	1263748420	1599098708	1162627398	HED_DESKTOP_FILE	
2 [S0] 3 [s7]			[7ffff980]		1752379250	0795177569	1819308129	=/usr/share/appl	
3 [8/] 4 [t8]			[7ffff990]	1952539497	1936617321	1937010991	0778922352	ications/qtspim.	
5 [t9]			[7ffff9a0]	1802724708	0007368564	1397966163	1598967625	desktop.SESSION_	
6 [k0]			[7ffff9b0]	1095647565	1028801863	1633906540	1651847020	MANAGER = local/ub	
	= 0		[7ffff9c0]		1949253690	0774860909	0759513929	untu:@/tmp/.ICE-	

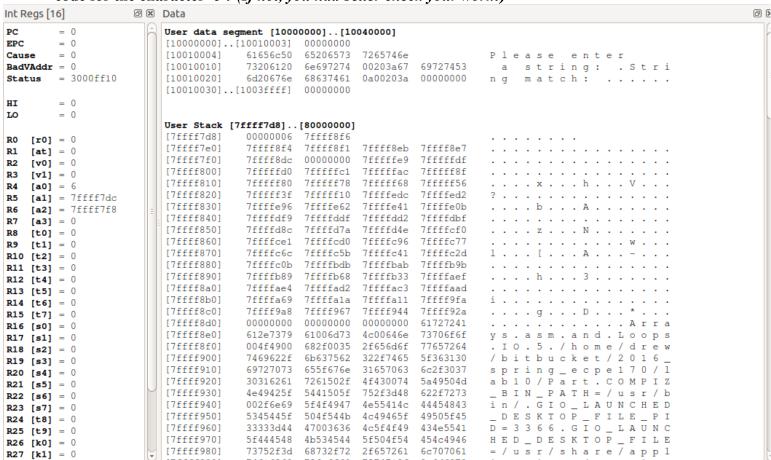
## Lab Part 4 – Arrays

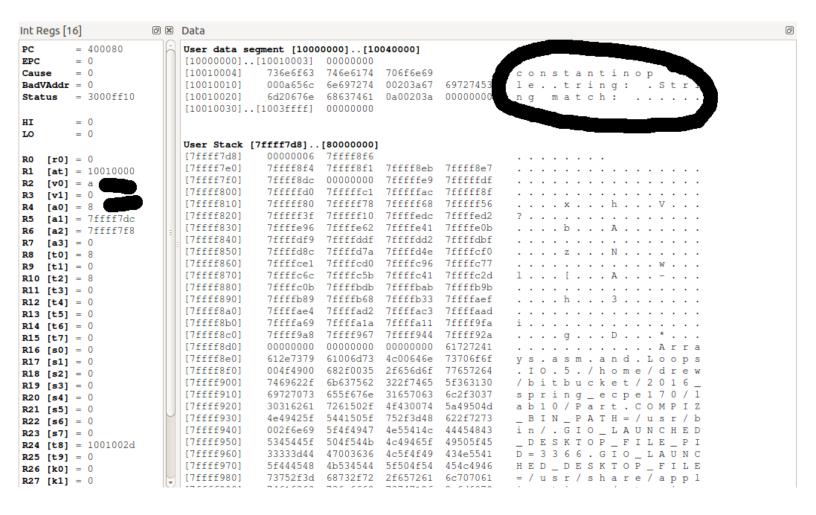
Int R	egs [10	] @	e X	Data						<b>a</b>
PC EPC Caus		= 0 = 0 = 0	Â	User data seg [10000000][ [10010014]	10010013] 0		-			
BadV Stat	Addr us	= 0 = 805371664		[10010020] [10010030][		0000000005 0000000	0000000012	0000000000		
HI		= 0		H 044 17						
LO	:	= 0		User Stack [7 [7ffff7f4]	0000000003	2147481846		01.47.400.615		1
R0	[r0]	= 0		[7ffff800]	2147481833		2147483625	2147483615		
R1	[at]	= 0		[7ffff810]	2147483600			2147483535		
R2	[v0]	= 0		[7ffff820]		2147483512		2147483478	x h V	
R3	[v1]	= 0		[7ffff830]		2147483408		2147483346	?	
R4	[a0]	= 3		[7ffff840]	2147483286		2147483201	2147483147	b A	
R5	[a1]	= 2147481592		[7ffff850]	2147483129		2147483090	2147483071		
R6	[a2]	= 2147481608		[7ffff860]	2147483020	2147483002		2147482864	z N	
	[a3]			[7ffff870]	2147482849	2147482832		2147482743		
	[t0]			[7ffff880]	2147482732	2147482715	2147482689	2147482669	1 [ A	
	[t1]			[7ffff890]	2147482635			2147482523		
	[t2]			[7ffff8a0]	2147482505			2147482351	h 3	
	[t3]			[7ffff8b0]	2147482340			2147482285	:	
	[t4]			[7ffff8c0]	2147482217			2147482106	i	
	[t5]			[7ffff8d0]	2147482024	2147481959		2147481898	g D *	
	[t6]			[7ffff8e0]	0000000000	0000000000		0779319649		
	[t7]			[7ffff8f0] [7ffff900]		1747910708		2003137124	asm.4./home/drew	
	[s0]			[7ffff910]	1769107571	1801680226	0828731491	1597387056	/bitbucket/2016_	
	[s1]			[7ffff920]		1918980143			spring_ecpe170/l ab10/Part.COMPIZ	
	[s2]			[7ffff930]		1413566559		1647276659	_BIN_PATH = / usr/b	
	[s3]			[7ffff940]		1599031623		1145391171	in / . GIO LAUNCHED	
	[s4]			[7ffff950]		1347376203		1230004037	_ DESKTOP _ FILE _ PI	
	[s5]			[7ffff960]	0858996036			1129207105	D = 3 3 6 6 . G I O _ L A U N C	
	[s6]			[7ffff970]	1598309704			1162627398	HED_DESKTOP_FILE	
	[s7]			[7ffff980]		1752379250		1819308129	= / usr/share/appl	
	[t8]			[7ffff990]		1936617321		0778922352	ications/qtspim.	
	[t9]			[7ffff9a0]	1802724708		1397966163	1598967625	desktop.SESSION_	
	[k0]			[7ffff9b0]		1028801863			MANAGER=local/ub	
R27	[k1]	= 0	-						MANAGER-10Ca1/ub	



#### Lab Part 5 – I/O, Loops, and Arrays

(9) Take a screenshot of the MIPS memory panel (data tab) after your program finishes. Put the memory panel in Hex mode (right-click), since Decimal mode will not allow us to distinguish between bytes. Circle two things: the final value of the pointer 'result' in memory, and the corresponding location that result points to. Does that location in memory contain the ASCII code for the character 'e'? (If not, you had better check your work!)





#### -All CodeIn BitBucket