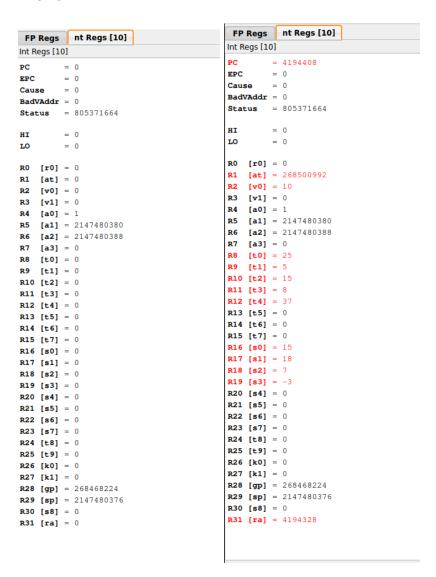# Lab Report

## ECPE 170 – Computer Systems and Networks – Spring 2016

**Name:** Nicolas Ahn

**Lab Topic:** Lab Name (Lab #: )

**Question #1** Take two screenshots of the MIPS register panel: one before your program runs, and one after your program finishes.  Put the register panel in Decimal mode (right-click) so it is easy to see register values.

**Answer:**

| FP Regs | nt Regs [10] |
| --- | --- |

Int Regs [10]

```
PC        = 0
EPC       = 0
Cause     = 0
BadVAddr  = 0
Status    = 805371664

HI        = 0
LO        = 0

R0   [r0]  = 0
R1   [at]  = 0
R2   [v0]  = 0
R3   [v1]  = 0
R4   [a0]  = 1
R5   [a1]  = 2147480380
R6   [a2]  = 2147480388
R7   [a3]  = 0
R8   [t0]  = 0
R9   [t1]  = 0
R10  [t2]  = 0
R11  [t3]  = 0
R12  [t4]  = 0
R13  [t5]  = 0
R14  [t6]  = 0
R15  [t7]  = 0
R16  [s0]  = 0
R17  [s1]  = 0
R18  [s2]  = 0
R19  [s3]  = 0
R20  [s4]  = 0
R21  [s5]  = 0
R22  [s6]  = 0
R23  [s7]  = 0
R24  [t8]  = 0
R25  [t9]  = 0
R26  [k0]  = 0
R27  [k1]  = 0
R28  [gp]  = 268468224
R29  [sp]  = 2147480376
R30  [s8]  = 0
R31  [ra]  = 0
```

| FP Regs | nt Regs [10] |
| --- | --- |

Int Regs [10]

```
PC        = 4194408
EPC       = 0
Cause     = 0
BadVAddr  = 0
Status    = 805371664

HI        = 0
LO        = 0

R0   [r0]  = 0
R1   [at]  = 268500992
R2   [v0]  = 10
R3   [v1]  = 0
R4   [a0]  = 1
R5   [a1]  = 2147480380
R6   [a2]  = 2147480388
R7   [a3]  = 0
R8   [t0]  = 25
R9   [t1]  = 5
R10  [t2]  = 15
R11  [t3]  = 8
R12  [t4]  = 37
R13  [t5]  = 0
R14  [t6]  = 0
R15  [t7]  = 0
R16  [s0]  = 15
R17  [s1]  = 18
R18  [s2]  = 7
R19  [s3]  = -3
R20  [s4]  = 0
R21  [s5]  = 0
R22  [s6]  = 0
R23  [s7]  = 0
R24  [t8]  = 0
R25  [t9]  = 0
R26  [k0]  = 0
R27  [k1]  = 0
R28  [gp]  = 268468224
R29  [sp]  = 2147480376
R30  [s8]  = 0
R31  [ra]  = 4194328
```

**Question #2** Take two screenshots of the MIPS memory panel (data tab): one before your program runs, and one after your program finishes.   Put the memory panel in Decimal mode (right-click), so it is easy to see memory values.  In the after-execution capture, circle the memory location (not register) that contains the final calculated value of Z.

**Answer:**

**Data** | **Text**

Data

**User data segment [10000000]..[10040000]**
[10000000]..[1003ffff]   00000000


**User Stack [7ffff338]..[80000000]**
| | | | | |
|---|---|---|---|---|
| [7ffff338] | 0000000001 | 2147480578 | | | . . . . . . . . . |
| [7ffff340] | 0000000000 | 2147483632 | 2147483510 | 2147483491 | . . . . . . . . . v . . . c . . . |
| [7ffff350] | 2147483471 | 2147483421 | 2147483388 | 2147483365 | O . . . . . . . . . . . . . . . |
| [7ffff360] | 2147483321 | 2147483289 | 2147483248 | 2147483228 | . . . . . . . . p . . . \ . . . |
| [7ffff370] | 2147483200 | 2147483172 | 2147483129 | 2147483114 | @ . . . $ . . . . . . . . . . . |
| [7ffff380] | 2147483082 | 2147483061 | 2147483009 | 2147482987 | . . . . . . . . . . . . . k . . . |
| [7ffff390] | 2147482946 | 2147482933 | 2147482915 | 2147482899 | B . . . 5 . . . # . . . . . . . |
| [7ffff3a0] | 2147482881 | 2147482864 | 2147481345 | 2147481312 | . . . . . . . . . . . . . . . . |
| [7ffff3b0] | 2147481295 | 2147481209 | 2147481175 | 2147481152 | . . . . y . . . W . . . @ . . . |
| [7ffff3c0] | 2147481132 | 2147481100 | 2147481088 | 2147481058 | , . . . . . . . . . . . . . . . |
| [7ffff3d0] | 2147481047 | 2147481039 | 2147481021 | 2147480990 | . . . . . . . . . . . . . . . . |
| [7ffff3e0] | 2147480900 | 2147480762 | 2147480739 | 2147480685 | D . . . . . . . . . . . m . . . |
| [7ffff3f0] | 2147480645 | 2147480627 | 0000000000 | 0000000000 | E . . . 3 . . . . . . . . . . . |
| [7ffff400] | 1747910656 | 0795176303 | 1801677166 | 0841968741 | . . / h o m e / n i c k e l / 2 |
| [7ffff410] | 1597125168 | 1769107571 | 1700751214 | 0828731491 | 0 2 2 _ s p r i n g _ e c p e 1 |
| [7ffff420] | 1815031863 | 0959472225 | 1918988335 | 1630417268 | 7 0 / l a b 0 9 / p a r t 1 . a |
| [7ffff430] | 1593863539 | 1937059645 | 1768042354 | 1953574766 | s m . _ = / u s r / b i n / q t |
| [7ffff440] | 1835626611 | 1145851648 | 1027888976 | 1836017711 | s p i m . O L D P W D = / h o m |
| [7ffff450] | 1768828773 | 1818585955 | 0842019375 | 1886609202 | e / n i c k e l / 2 0 2 2 _ s p |
| [7ffff460] | 1735289202 | 1885562207 | 0808923493 | 1430406144 | r i n g _ e c p e 1 7 0 . D B U |
| [7ffff470] | 1163091795 | 1330205523 | 1430413134 | 1145134931 | S _ S E S S I O N _ B U S _ A D |
| [7ffff480] | 1397051972 | 1853177171 | 1882880105 | 1030255713 | D R E S S = u n i x : p a t h = |
| [7ffff490] | 1853190703 | 1702065455 | 0808529778 | 1647259696 | / r u n / u s e r / 1 0 0 0 / b |
| [7ffff4a0] | 1191211893 | 1163087172 | 1330205523 | 1651850574 | u s . G D M S E S S I O N = u b |
| [7ffff4b0] | 1970564725 | 1919907885 | 1095762023 | 0792545364 | u n t u - x o r g . P A T H = / |
| [7ffff4c0] | 1701670760 | 1667853871 | 0795633003 | 1668246574 | h o m e / n i c k e l / . l o c |
| [7ffff4d0] | 1647275105 | 0792358505 | 0796029813 | 1633906540 | a l / b i n : / u s r / l o c a |
| [7ffff4e0] | 1651715948 | 0792358505 | 0796029813 | 1633906540 | l / s b i n : / u s r / l o c a |
| [7ffff4f0] | 1768042348 | 1966029422 | 1932489331 | 0980314466 | l / b i n : / u s r / s b i n : |
| [7ffff500] | 1920169263 | 1852400175 | 1651715898 | 0792358505 | / u s r / b i n : / s b i n : / |
| [7ffff510] | 0980314466 | 1920169263 | 1835099951 | 0792359781 | b i n : / u s r / g a m e s : / |
| [7ffff520] | 0796029813 | 1633906540 | 1634152300 | 0980641133 | u s r / l o c a l / g a m e s : |
| [7ffff530] | 1634628399 | 1768042352 | 1932474990 | 0795894126 | / s n a p / b i n : / s n a p / |
| [7ffff540] | 0007235938 | 1598506072 | 1096040772 | 1380533343 | b i n . X D G _ D A T A _ D I R |
| [7ffff550] | 1966030163 | 1932489331 | 1701994856 | 1969386799 | S = / u s r / s h a r e / u b u |
| [7ffff560] | 0762672238 | 1735552888 | 1937059642 | 1869361010 | n t u - x o r g : / u s r / l o |
| [7ffff570] | 0795631971 | 1918986355 | 0792342373 | 0796029813 | c a l / s h a r e / : / u s r / |
| [7ffff580] | 1918986355 | 0792342373 | 0796025206 | 0794978668 | s h a r e / : / v a r / l i b / |
| [7ffff590] | 1885433459 | 1701064548 | 1869900659 | 1146617968 | s n a p d / d e s k t o p . X D |
| [7ffff5a0] | 1431461703 | 1296651342 | 1229217605 | 1915698514 | G _ R U N T I M E _ D I R = / r |
| [7ffff5b0] | 1966042741 | 0796026227 | 0808464433 | 1599361280 | u n / u s e r / 1 0 0 0 . Q T _ |
| [7ffff5c0] | 1298091337 | 1280656463 | 1651064133 | 1392538485 | I M _ M O D U L E = i b u s . S |
| [7ffff5d0] | 1280724040 | 1140863037 | 1280332617 | 0977099073 | H L V L = 0 . D I S P L A Y = : |
| [7ffff5e0] | 1313275052 | 1508377305 | 1207237332 | 1270348207 | 0 . G N O M E _ T E R M I N A L |

Data

**User data segment [10000000]..[10040000]**

```
[10000000]..[1000ffff]   00000000
[10010000]       0000000037  0000000000  0000000000  0000000000    % . . . . . . . . . . . . . . . . .
[10010010]..[1003ffff]   00000000
```

**User Stack [7ffff338]..[80000000]**

```
[7ffff338]    0000000001   2147480578                                 . . . . . . . .
[7ffff340]    0000000000   2147483632  2147483510  2147483491         . . . . . . . . . . v . . . . c . . . .
[7ffff350]    2147483471   2147483421  2147483388  2147483365         O . . . . . . . . . . . . . . . . .
[7ffff360]    2147483321   2147483289  2147483248  2147483228         . . . . . . . . . . . . p . . . \ . . .
[7ffff370]    2147483200   2147483172  2147483129  2147483114         @ . . . . $ . . . . . . . . . . . .
[7ffff380]    2147483082   2147483061  2147483009  2147482987         . . . . . . . . . . . . . . k . . . .
[7ffff390]    2147482946   2147482933  2147482915  2147482899         B . . . . 5 . . . . # . . . . . . . .
[7ffff3a0]    2147482881   2147482864  2147481345  2147481312         . . . . . . . . . . . . . . . . . .
[7ffff3b0]    2147481295   2147481209  2147481175  2147481152         . . . . . y . . . W . . . . @ . . . .
[7ffff3c0]    2147481132   2147481100  2147481088  2147481058         , . . . . . . . . . . . . . . . . .
[7ffff3d0]    2147481047   2147481039  2147481021  2147480990         . . . . . . . . . . . . . . . . . .
[7ffff3e0]    2147480900   2147480762  2147480739  2147480685         D . . . . . . . . . . . . . m . . . .
[7ffff3f0]    2147480645   2147480627  0000000000  0000000000         E . . . 3 . . . . . . . . . . . . .
[7ffff400]    1747910656   0795176303  1801677166  0841968741         . . / h o m e / n i c k e l / 2
[7ffff410]    1597125168   1769107571  1700751214  0828731491         0 2 2 _ s p r i n g _ e c p e l
[7ffff420]    1815031863   0959472225  1918988335  1630417268         7 0 / l a b 0 9 / p a r t 1 . a
[7ffff430]    1593863539   1937059645  1768042354  1953574766         s m . _ - / u s r / b i n / q t
[7ffff440]    1835626611   1145851648  1027888976  1836017711         s p i m . O L D P W D - / h o m
[7ffff450]    1768828773   1818585955  0842019375  1886609202         e / n i c k e l / 2 0 2 2 _ s p
[7ffff460]    1735289202   1885562207  0808923493  1430406144         r i n g _ e c p e l 7 0 . D B U
[7ffff470]    1163091795   1330205523  1430413134  1145134931         S _ S E S S I O N _ B U S _ A D
[7ffff480]    1397051972   1853177171  1882880105  1030255713         D R E S S - u n i x : p a t h -
[7ffff490]    1853190703   1702065455  0808529778  1647259696         / r u n / u s e r / 1 0 0 0 / b
[7ffff4a0]    1191211893   1163087172  1330205523  1651850574         u s . G D M S E S S I O N - u b
[7ffff4b0]    1970564725   1919907885  1095762023  0792545364         u n t u - x o r g . P A T H - /
[7ffff4c0]    1701670760   1667853871  0795633003  1668246574         h o m e / n i c k e l / . l o c
[7ffff4d0]    1647275105   0792358505  0796029813  1633906540         a l / b i n : / u s r / l o c a
[7ffff4e0]    1651715948   0792358505  0796029813  1633906540         l / s b i n : / u s r / l o c a
[7ffff4f0]    1768042348   1966029422  1932489331  0980314466         l / b i n : / u s r / s b i n :
[7ffff500]    1920169263   1852400175  1651715898  0792358505         / u s r / b i n : / s b i n : /
[7ffff510]    0980314466   1920169263  1835099951  0792359781         b i n : / u s r / g a m e s : /
[7ffff520]    0796029813   1633906540  1634152300  0980641133         u s r / l o c a l / g a m e s :
[7ffff530]    1634628399   1768042352  1932474990  0795894126         / s n a p / b i n : / s n a p /
[7ffff540]    0007235938   1598506072  1096040772  1380533343         b i n . X D G _ D A T A _ D I R
[7ffff550]    1966030163   1932489331  1701994856  1969386799         S - / u s r / s h a r e / u b u
[7ffff560]    0762672238   1735552888  1937059642  1869361010         n t u - x o r g : / u s r / l o
[7ffff570]    0795631971   1918986355  0792342373  0796029813         c a l / s h a r e / : / u s r /
[7ffff580]    1918986355   0792342373  0796025206  0794978668         s h a r e / : / v a r / l i b /
[7ffff590]    1885433459   1701064548  1869900659  1146617968         s n a p d / d e s k t o p . X D
[7ffff5a0]    1431461703   1296651342  1229217605  1915698514         G _ R U N T I M E _ D I R - / r
[7ffff5b0]    1966042741   0796026227  0808464433  1599361280         u n / u s e r / 1 0 0 0 . Q T _
```

**Question #3** Take two screenshots of the MIPS register panel: one before your program runs, and one after your program finishes.  Put the register panel in Decimal mode (right-click) so it is easy to see register values.
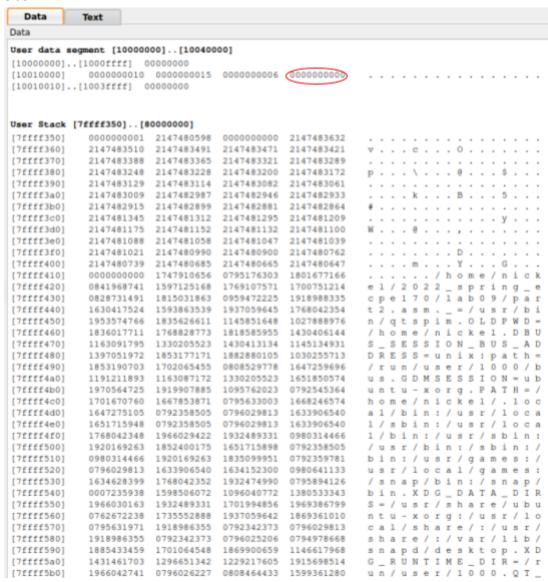
**Answer:**

```
PC          = 0              PC          = 4194484
EPC         = 0              EPC         = 0
Cause       = 0              Cause       = 0
BadVAddr    = 0              BadVAddr    = 0
Status      = 805371664      Status      = 805371664

HI          = 0              HI          = 0
LO          = 0              LO          = 0

R0  [r0] = 0                 R0  [r0] = 0
R1  [at] = 0                 R1  [at] = 268500992
R2  [v0] = 0                 R2  [v0] = 10
R3  [v1] = 0                 R3  [v1] = 0
R4  [a0] = 1                 R4  [a0] = 1
R5  [a1] = 2147480404        R5  [a1] = 2147480404
R6  [a2] = 2147480412        R6  [a2] = 2147480412
R7  [a3] = 0                 R7  [a3] = 0
R8  [t0] = 0                 R8  [t0] = 0
R9  [t1] = 0                 R9  [t1] = 0
R10 [t2] = 0                 R10 [t2] = 0
R11 [t3] = 0                 R11 [t3] = 0
R12 [t4] = 0                 R12 [t4] = 0
R13 [t5] = 0                 R13 [t5] = 0
R14 [t6] = 0                 R14 [t6] = 0
R15 [t7] = 0                 R15 [t7] = 0
R16 [s0] = 0                 R16 [s0] = 10
R17 [s1] = 0                 R17 [s1] = 15
R18 [s2] = 0                 R18 [s2] = 6
R19 [s3] = 0                 R19 [s3] = 0
R20 [s4] = 0                 R20 [s4] = 0
R21 [s5] = 0                 R21 [s5] = 0
R22 [s6] = 0                 R22 [s6] = 0
R23 [s7] = 0                 R23 [s7] = 0
R24 [t8] = 0                 R24 [t8] = 0
R25 [t9] = 0                 R25 [t9] = 0
R26 [k0] = 0                 R26 [k0] = 0
R27 [k1] = 0                 R27 [k1] = 0
R28 [gp] = 268468224         R28 [gp] = 268468224
R29 [sp] = 2147480400        R29 [sp] = 2147480400
R30 [s8] = 0                 R30 [s8] = 0
R31 [ra] = 0                 R31 [ra] = 4194328
```

**Question #4** Take two screenshots of the MIPS memory panel (data tab): one before your program runs, and one after your program finishes.   Put the memory panel in Decimal mode

(right-click), so it is easy to see memory values.  In the after-execution capture, circle the memory location (not register) that contains the final calculated value of Z.

**Answer:**

Obs:



| Data | Text |
| --- | --- |

Data

```
User data segment [10000000]..[10040000]
[10000000]..[1000ffff]   00000000
[10010000]      0000000010  0000000015  0000000006  (0000000000)   . . . . . . . . . . . . . . . .
[10010010]..[1003ffff]   00000000


User Stack [7ffff350]..[80000000]
[7ffff350]      0000000001  2147480598  0000000000  2147483632   . . . . . . . . . . . . . . . .
[7ffff360]      2147483510  2147483491  2147483471  2147483421   v . . . . c . . . . O . . . . . . .
[7ffff370]      2147483388  2147483365  2147483321  2147483289   . . . . . . . . . . . . . . . . . .
[7ffff380]      2147483248  2147483228  2147483200  2147483172   p . . . . \ . . . . @ . . . . $ . . . .
[7ffff390]      2147483129  2147483114  2147483082  2147483061   . . . . . . . . . . . . . . . . . .
[7ffff3a0]      2147483009  2147482987  2147482946  2147482933   . . . . . k . . . . B . . . . 5 . . . .
[7ffff3b0]      2147482915  2147482899  2147482881  2147482864   # . . . . . . . . . . . . . . . .
[7ffff3c0]      2147481345  2147481312  2147481295  2147481209   . . . . . . . . . . . . . . . . y . . .
[7ffff3d0]      2147481175  2147481152  2147481132  2147481100   W . . . . @ . . . . , . . . . . . .
[7ffff3e0]      2147481088  2147481058  2147481047  2147481039   . . . . . . . . . . . . . . . . . .
[7ffff3f0]      2147481021  2147480990  2147480947  2147480762   . . . . . . . . . D . . . . . . .
[7ffff400]      2147480739  2147480685  2147480665  2147480647   . . . . m . . . . Y . . . . G . . .
[7ffff410]      0000000000  1747910656  0795176303  1801677166   . . . . . . . / h o m e / n i c k
[7ffff420]      0841968741  1597125168  1769107571  1700751214   e l / 2 0 2 2 _ s p r i n g _ e
[7ffff430]      0828731491  1815031863  0959472225  1918988335   c p e l 7 0 / l a b 0 9 / p a r
[7ffff440]      1630417524  1593863539  1937059645  1768042354   t 2 . a s m . _ = / u s r / b i
[7ffff450]      1953574766  1835626611  1145851648  1027888976   n / q t s p i m . O L D P W D =
[7ffff460]      1836017711  1768828773  1818585955  1430406144   / h o m e / n i c k e l . D B U
[7ffff470]      1163091795  1330205523  1430413134  1145134931   S _ S E S S I O N _ B U S _ A D
[7ffff480]      1397051972  1853177171  1882880105  1030255713   D R E S S = u n i x : p a t h =
[7ffff490]      1853190703  1702065455  0808529778  1647259696   / r u n / u s e r / 1 0 0 0 / b
[7ffff4a0]      1191211893  1163087172  1330205523  1651850574   u s . G D M S E S S I O N = u b
[7ffff4b0]      1970564725  1919907885  1095762023  0792545364   u n t u - x o r g . P A T H = /
[7ffff4c0]      1701670760  1667853871  0795633003  1668246574   h o m e / n i c k e l / . l o c
[7ffff4d0]      1647275105  0792358505  0796029813  1633906540   a l / b i n : / u s r / l o c a
[7ffff4e0]      1651715948  0792358505  0796029813  1633906540   l / s b i n : / u s r / l o c a
[7ffff4f0]      1768042348  1966029422  1932489331  0980314466   l / b i n : / u s r / s b i n :
[7ffff500]      1920169263  1852400175  1651715898  0792358505   / u s r / b i n : / s b i n : /
[7ffff510]      0980314466  1920169263  1835099951  0792359781   b i n : / u s r / g a m e s : /
[7ffff520]      0796029813  1633906540  1634152300  0980641133   u s r / l o c a l / g a m e s :
[7ffff530]      1634628399  1768042352  1932474990  0795894126   / s n a p / b i n : / s n a p /
[7ffff540]      0007235938  1598506072  1096040772  1380533343   b i n . X D G _ D A T A _ D I R
[7ffff550]      1966030163  1932489331  1701994856  1969386799   S = / u s r / s h a r e / u b u
[7ffff560]      0762672238  1735552888  1937059642  1869361010   n t u - x o r g : / u s r / l o
[7ffff570]      0795631971  1918986355  0792342373  0796029813   c a l / s h a r e / : / u s r /
[7ffff580]      1918986355  0792342373  0796025206  0794978668   s h a r e / : / v a r / l i b /
[7ffff590]      1885433459  1701064548  1869900659  1146617968   s n a p d / d e s k t o p . X D
[7ffff5a0]      1431461703  1296651342  1229217605  1915698514   G _ R U N T I M E _ D I R = / r
[7ffff5b0]      1966042741  0796026227  0808464433  1599361280   u n / u s e r / 1 0 0 0 . Q T _
```
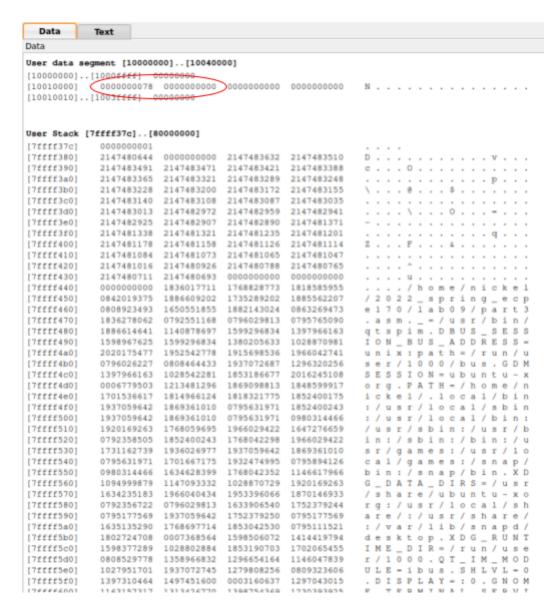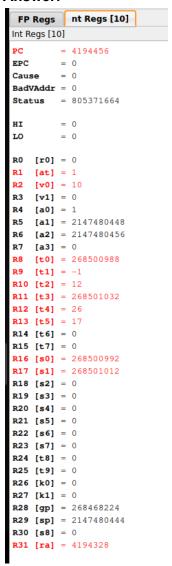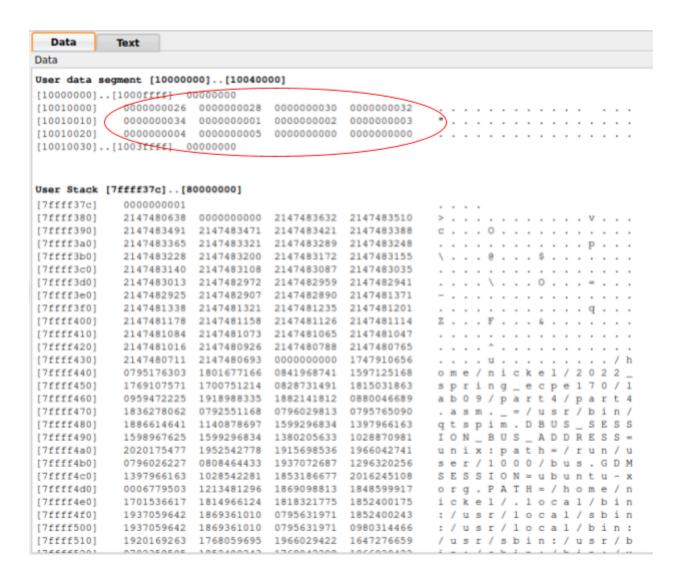
**Question #5** Take a screenshot of the MIPS register panel after your program finishes.  Put the register panel in Decimal mode (right-click) so it is easy to see register values.

**Answer:**

| FP Regs | nt Regs [10] |
|---------|--------------|

Int Regs [10]

```
PC        = 4194428
EPC       = 0
Cause     = 0
BadVAddr  = 0
Status    = 805371664

HI        = 0
LO        = 0

R0   [r0]  = 0
R1   [at]  = 268500992
R2   [v0]  = 10
R3   [v1]  = 0
R4   [a0]  = 1
R5   [a1]  = 2147480448
R6   [a2]  = 2147480456
R7   [a3]  = 0
R8   [t0]  = 78
R9   [t1]  = 0
R10  [t2]  = 0
R11  [t3]  = 0
R12  [t4]  = 0
R13  [t5]  = 0
R14  [t6]  = 0
R15  [t7]  = 0
R16  [s0]  = 0
R17  [s1]  = 0
R18  [s2]  = 0
R19  [s3]  = 0
R20  [s4]  = 0
R21  [s5]  = 0
R22  [s6]  = 0
R23  [s7]  = 0
R24  [t8]  = 0
R25  [t9]  = 0
R26  [k0]  = 0
R27  [k1]  = 0
R28  [gp]  = 268468224
R29  [sp]  = 2147480444
R30  [s8]  = 0
R31  [ra]  = 4194328
```

**Question #6** Take a screenshot of the MIPS memory panel (data tab) after your program finishes.   Put the memory panel in Decimal mode (right-click), so it is easy to see memory values. **Circle the memory location (not register) that contains the final calculated values of I and Z.**

**Answer:**

| Data | Text |
|---|---|

Data

User data segment [10000000]..[10040000]

| | | | | | |
|---|---|---|---|---|---|
| [10000000]..[1000ffff] | 00000000 | | | | |
| [10010000] | 0000000078 | 0000000000 | 0000000000 | 0000000000 | N . . . . . . . . . . . . . . . |
| [10010010]..[1003ffff] | 00000000 | | | | |

User Stack [7ffff37c]..[80000000]

| | | | | | |
|---|---|---|---|---|---|
| [7ffff37c] | 0000000001 | | | | . . . . |
| [7ffff380] | 2147480644 | 0000000000 | 2147483632 | 2147483510 | D . . . . . . . . . . . . . V . . . |
| [7ffff390] | 2147483491 | 2147483471 | 2147483421 | 2147483388 | c . . . . O . . . . . . . . . . . |
| [7ffff3a0] | 2147483365 | 2147483321 | 2147483289 | 2147483248 | . . . . . . . . . . . . . . p . . . |
| [7ffff3b0] | 2147483228 | 2147483200 | 2147483172 | 2147483155 | \ . . . . @ . . . . $ . . . . . . . |
| [7ffff3c0] | 2147483140 | 2147483108 | 2147483087 | 2147483035 | . . . . . . . . . . . . . . . . . |
| [7ffff3d0] | 2147483013 | 2147482972 | 2147482959 | 2147482941 | . . . . . \ . . . . O . . . . - . . . |
| [7ffff3e0] | 2147482925 | 2147482907 | 2147482890 | 2147481371 | - . . . . . . . . . . . . . . . . |
| [7ffff3f0] | 2147481338 | 2147481321 | 2147481235 | 2147481201 | . . . . . . . . . . . . . q . . . |
| [7ffff400] | 2147481178 | 2147481158 | 2147481126 | 2147481114 | Z . . . . F . . . . & . . . . . . . |
| [7ffff410] | 2147481084 | 2147481073 | 2147481065 | 2147481047 | . . . . . . . . . . . . . . . . . |
| [7ffff420] | 2147481016 | 2147480926 | 2147480788 | 2147480765 | . . . . . ^ . . . . . . . . . . . |
| [7ffff430] | 2147480711 | 2147480693 | 0000000000 | 0000000000 | . . . . . u . . . . . . . . . . . |
| [7ffff440] | 0000000000 | 1836017711 | 1768828773 | 1818585955 | . . . . . / h o m e / n i c k e l |
| [7ffff450] | 0842019375 | 1886609202 | 1735289202 | 1885562207 | / 2 0 2 2 _ s p r i n g _ e c p |
| [7ffff460] | 0808923493 | 1650551855 | 1882143024 | 0863269473 | e l 7 0 / l a b 0 9 / p a r t 3 |
| [7ffff470] | 1836278062 | 0792551168 | 0796029813 | 0795765090 | . a s m . _ = / u s r / b i n / |
| [7ffff480] | 1886614641 | 1140878697 | 1599296834 | 1397966163 | q t s p i m . D B U S _ S E S S |
| [7ffff490] | 1598967625 | 1599296834 | 1380205633 | 1028870981 | I O N _ B U S _ A D D R E S S = |
| [7ffff4a0] | 2020175477 | 1952542778 | 1915698536 | 1966042741 | u n i x : p a t h = / r u n / u |
| [7ffff4b0] | 0796026227 | 0808464433 | 1937072687 | 1296320256 | s e r / 1 0 0 0 / b u s . G D M |
| [7ffff4c0] | 1397966163 | 1028542281 | 1853186677 | 2016245108 | S E S S I O N = u b u n t u - x |
| [7ffff4d0] | 0006779503 | 1213481296 | 1869098813 | 1848599917 | o r g . P A T H = / h o m e / n |
| [7ffff4e0] | 1701536617 | 1814966124 | 1818321775 | 1852400175 | i c k e l / . l o c a l / b i n |
| [7ffff4f0] | 1937059642 | 1869361010 | 0795631971 | 1852400243 | : / u s r / l o c a l / s b i n |
| [7ffff500] | 1937059642 | 1869361010 | 0795631971 | 0980314466 | : / u s r / l o c a l / b i n : |
| [7ffff510] | 1920169263 | 1768059695 | 1966029422 | 1647276659 | / u s r / s b i n : / u s r / b |
| [7ffff520] | 0792358505 | 1852400243 | 1768042298 | 1966029422 | i n : / s b i n : / b i n : / u |
| [7ffff530] | 1731162739 | 1936026977 | 1937059642 | 1869361010 | s r / g a m e s : / u s r / l o |
| [7ffff540] | 0795631971 | 1701667175 | 1932474995 | 0795894126 | c a l / g a m e s : / s n a p / |
| [7ffff550] | 0980314466 | 1634628399 | 1768042352 | 1146617966 | b i n : / s n a p / b i n . X D |
| [7ffff560] | 1094999879 | 1147093332 | 1028870729 | 1920169263 | G _ D A T A _ D I R S = / u s r |
| [7ffff570] | 1634235183 | 1966040434 | 1953396066 | 1870146933 | / s h a r e / u b u n t u - x o |
| [7ffff580] | 0792356722 | 0796029813 | 1633906540 | 1752379244 | r g : / u s r / l o c a l / s h |
| [7ffff590] | 0795177569 | 1937059642 | 1752379250 | 0795177569 | a r e / : / u s r / s h a r e / |
| [7ffff5a0] | 1635135290 | 1768697714 | 1853042530 | 0795111521 | : / v a r / l i b / s n a p d / |
| [7ffff5b0] | 1802724708 | 0007368564 | 1598506072 | 1414419794 | d e s k t o p . X D G _ R U N T |
| [7ffff5c0] | 1598377289 | 1028802884 | 1853190703 | 1702065455 | I M E _ D I R = / r u n / u s e |
| [7ffff5d0] | 0808529778 | 1358966832 | 1296654164 | 1146047839 | r / 1 0 0 0 . Q T _ I M _ M O D |
| [7ffff5e0] | 1027951701 | 1937072745 | 1279808256 | 0809323606 | U L E = i b u s . S H L V L = 0 |
| [7ffff5f0] | 1397310464 | 1497451600 | 0003160637 | 1297043015 | . D I S P L A Y = : 0 . G N O M |
| [7ffff600] | 1143157317 | 1313426770 | 1398754360 | 1230303035 | E T E R M I N A L S E R V |

**Question #7** Take a screenshot of the MIPS register panel after your program finishes.  Put the register panel in Decimal mode (right-click) so it is easy to see register values.

**Answer:**

```
 FP Regs    nt Regs [10]
Int Regs [10]

PC        = 4194456
EPC       = 0
Cause     = 0
BadVAddr  = 0
Status    = 805371664

HI        = 0
LO        = 0

R0   [r0] = 0
R1   [at] = 1
R2   [v0] = 10
R3   [v1] = 0
R4   [a0] = 1
R5   [a1] = 2147480448
R6   [a2] = 2147480456
R7   [a3] = 0
R8   [t0] = 268500988
R9   [t1] = -1
R10  [t2] = 12
R11  [t3] = 268501032
R12  [t4] = 26
R13  [t5] = 17
R14  [t6] = 0
R15  [t7] = 0
R16  [s0] = 268500992
R17  [s1] = 268501012
R18  [s2] = 0
R19  [s3] = 0
R20  [s4] = 0
R21  [s5] = 0
R22  [s6] = 0
R23  [s7] = 0
R24  [t8] = 0
R25  [t9] = 0
R26  [k0] = 0
R27  [k1] = 0
R28  [gp] = 268468224
R29  [sp] = 2147480444
R30  [s8] = 0
R31  [ra] = 4194328
```

**Question #8** Take a screenshot of the MIPS memory panel (data tab) after your program finishes.   Put the memory panel in Decimal mode (right-click), so it is easy to see memory values.  Circle the final values of array A.

**Answer:**

**Question #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!)

**Answer:**

**Data** | **Text**

Data

**User data segment [10000000]..[10040000]**

```
[10000000]..[1000ffff]   00000000
[10010000]    74736574   000a0808   00000000   00000000    t e s t . . . . . . . . . . . .
[10010010]..[100100ff]   00000000
[10010100]    73726946   616d2074   20686374   61207461    F i r s t   m a t c h   a t   a
[10010110]    65726464   00207373   6568540a   74616d20    d d r e s s   . . T h e   m a t
[10010120]    6e696863   68632067   63617261   20726574    c h i n g   c h a r a c t e r
[10010130]    65207369   206f4e00   6374616d   6f662068    i s   e . N o   m a t c h   f o
[10010140]    00646e75   10010001   00000000   00000000    u n d . . . . . . . . . . . .
[10010150]..[1003ffff]   00000000
```

**User Stack [7ffff37c]..[80000000]**

```
[7ffff37c]    00000001                                      . . . .
[7ffff380]    7ffff43e   00000000   7ffffff0   7ffffff76    > . . . . . . . . . . v . . .
[7ffff390]    7fffff63   7fffff4f   7fffff1d   7ffffefc    c . . . O . . . . . . . . . .
[7ffff3a0]    7ffffee5   7ffffeb9   7fffffe99   7ffffe70    . . . . . . . . . . P . . . .
[7ffff3b0]    7ffffe5c   7ffffe40   7fffffe24   7ffffe13    \ . . . . @ . . . . $ . . . . .
[7ffff3c0]    7ffffe04   7ffffde4   7fffffdcf   7ffffd9b    . . . . . . . . . . . . . . . .
[7ffff3d0]    7ffffd85   7ffffd5c   7fffffd4f   7ffffd3d    . . . . . \ . . . . O . . . = . . .
[7ffff3e0]    7ffffd2d   7ffffd1b   7fffffd0a   7ffff71b    - . . . . . . . . . . . . . . .
[7ffff3f0]    7ffff6fa   7ffff6e9   7ffff693   7ffff671    . . . . . . . . . . . . q . . .
[7ffff400]    7ffff65a   7ffff646   7ffff626   7ffff61a    Z . . . . F . . . . & . . . . . .
[7ffff410]    7ffff5fc   7ffff5f1   7ffff5e9   7ffff5d7    . . . . . . . . . . . . . . . .
[7ffff420]    7ffff5b8   7ffff55e   7ffff4d4   7ffff4bd    . . . . . ^ . . . . . . . . . .
[7ffff430]    7ffff487   7ffff475   00000000   682f0000    . . . . . u . . . . . . . . / h
[7ffff440]    2f656d6f   6b63696e   322f6c65   5f323230    o m e / n i c k e l / 2 0 2 2 _
[7ffff450]    69727073   655f676e   31657063   6c2f3037    s p r i n g _ e c p e l 7 0 / l
[7ffff460]    39306261   7261702f   702f3574   35747261    a b 0 9 / p a r t 5 / p a r t 5
[7ffff470]    6d73612e   2f3d5f00   2f727375   2f6e6962    . a s m . _ = / u s r / b i n /
[7ffff480]    70737471   44006d69   5f535542   53534553    q t s p i m . D B U S _ S E S S
[7ffff490]    5f4e4f49   5f535542   52444441   3d535345    I O N _ B U S _ A D D R E S S =
[7ffff4a0]    78696e75   7461703a   722f3d68   752f6e75    u n i x : p a t h = / r u n / u
[7ffff4b0]    2f726573   30303031   7375622f   4d444700    s e r / 1 0 0 0 / b u s . G D M
[7ffff4c0]    53534553   3d4e4f49   6e756275   782d7574    S E S S I O N = u b u n t u - x
[7ffff4d0]    0067726f   48544150   6f682f3d   6e2f656d    o r g . P A T H = / h o m e / n
[7ffff4e0]    656b6369   6c2e2f6c   6c61636f   6e69622f    i c k e l / . l o c a l / b i n
[7ffff4f0]    73752f3a   6f6c2f72   2f6c6163   6e696273    : / u s r / l o c a l / s b i n
[7ffff500]    73752f3a   6f6c2f72   2f6c6163   3a6e6962    : / u s r / l o c a l / b i n :
[7ffff510]    7273752f   6962732f   752f3a6e   622f7273    / u s r / s b i n : / u s r / b
[7ffff520]    2f3a6e69   6e696273   69622f3a   752f3a6e    i n : / s b i n : / b i n : / u
[7ffff530]    672f7273   73656d61   73752f3a   6f6c2f72    s r / g a m e s : / u s r / l o
[7ffff540]    2f6c6163   656d6167   732f3a73   2f70616e    c a l / g a m e s : / s n a p /
[7ffff5501]   3a6e6962   616e732f   69622f70   4458006e    b i n : / s n a p / b i n . X D
```