Midterm Review

Coding Exercise 1

Write 68K assembly program to modify the data at address $6000 as follows:

From:

0**1111**0000000**1**000

0**1**000**1**0000**1**0**1**000

0**1**000**1**0000000**1**000

0**1**000**1**0000000**1**000

0**1111**0000**11111**0

To:

000000000**11111**0

0000000000001000

0000000000001000

0000000000101000

0000000000001000

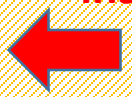
Given the following assembly code snippet. Assume that the value of SP is $9000, <D1> = $ FFFF0000, <D2> = $ AABBCCDD, <D3> = $12345678, <A1> = $A0B0C0D0, <A2> = $40506070, and <A3> = $10203040.

```
                          ORG          $2000
…
00002020                  JSR          FinalTest
00002026                  MOVE.B       D1, D4
…
0000308A        FinalTest MOVEM.W      D1-D3/A1-A3, -(SP)
0000308E        greater   MOVEA.L      #$1122, A3
…
00003098                  MOVE.B       D1, D2
…
000030CD                  CMP.L        D1, D3
000030D0                  BGT          greater
000030D2                  MOVE.B       #1, D3
…
00003144        exit      MOVEM.W      (SP)+, D1-D3/A1-A3
00003148                  RTS
```

Given the following assembly code snippet. Assume that the value of SP is $9000, <D1> = $ FFFF0000, <D2> = $ AABBCCDD, <D3> = $12345678, <A1> = $A0B0C0D0, <A2> = $40506070, and <A3> = $10203040.

```
                          ORG          $2000
…
00002020                  JSR          FinalTest
00002026                  MOVE.B       D1, D4
…
0000308A      FinalTest   MOVEM.W      D1-D3/A1-A3, -(SP)
0000308E      greater     MOVEA.L      #$1122, A3
…
00003098                  MOVE.B       D1, D2
…
000030CD                  CMP.L        D1, D3
000030D0                  BGT          greater
000030D2                  MOVE.B       #1, D3
…
00003144      exit        MOVEM.W      (SP)+, D1-D3/A1-A3
00003148                  RTS
```

After executing this instruction

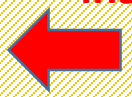


What's the value of SP?

Given the following assembly code snippet. Assume that the value of SP is $9000, <D1> = $ FFFF0000, <D2> = $ AABBCCDD, <D3> = $12345678, <A1> = $A0B0C0D0, <A2> = $40506070, and <A3> = $10203040.

```
                          ORG          $2000
…
00002020                  JSR          FinalTest
00002026                  MOVE.B       D1, D4
…
0000308A      FinalTest   MOVEM.W      D1-D3/A1-A3, -(SP)
0000308E      greater     MOVEA.L      #$1122, A3
…
00003098                  MOVE.B       D1, D2
…
000030CD                  CMP.L        D1, D3
000030D0                  BGT          greater
000030D2                  MOVE.B       #1, D3
…
00003144      exit        MOVEM.W      (SP)+, D1-D3/A1-A3
00003148                  RTS
```

After executing this instruction

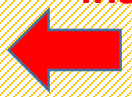


What's the longword value in (SP)?

Given the following assembly code snippet. Assume that the value of SP is $9000, <D1> = $ FFFF0000, <D2> = $ AABBCCDD, <D3> = $12345678, <A1> = $A0B0C0D0, <A2> = $40506070, and <A3> = $10203040.

```
                          ORG          $2000
…
00002020                  JSR          FinalTest
00002026                  MOVE.B       D1, D4
…
0000308A      FinalTest   MOVEM.W      D1-D3/A1-A3, -(SP)
0000308E      greater     MOVEA.L      #$1122, A3
…
00003098                  MOVE.B       D1, D2
…
000030CD                  CMP.L        D1, D3
000030D0                  BGT          greater
000030D2                  MOVE.B       #1, D3
…
00003144      exit        MOVEM.W      (SP)+, D1-D3/A1-A3
00003148                  RTS
```

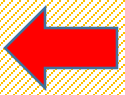
After executing this instruction



What's the value of PC?

Given the following assembly code snippet. Assume that the value of SP is $9000, <D1> = $ FFFF0000, <D2> = $ AABBCCDD, <D3> = $12345678, <A1> = $A0B0C0D0, <A2> = $40506070, and <A3> = $10203040.

```
                          ORG          $2000
…
00002020                  JSR          FinalTest
00002026                  MOVE.B       D1, D4
…
0000308A      FinalTest   MOVEM.W      D1-D3/A1-A3, -(SP)
0000308E      greater     MOVEA.L      #$1122, A3
…
00003098                  MOVE.B       D1, D2
…
000030CD                  CMP.L        D1, D3
000030D0                  BGT          greater
000030D2                  MOVE.B       #1, D3
…
00003144      exit        MOVEM.W      (SP)+, D1-D3/A1-A3
00003148                  RTS
```



At this instruction

What's the displacement value in hexadecimal?

Given the following assembly code snippet. Assume that the value of SP is $9000, <D1> = $ FFFF0000, <D2> = $ AABBCCDD, <D3> = $12345678, <A1> = $A0B0C0D0, <A2> = $40506070, and <A3> = $10203040.

```
                          ORG          $2000
…
00002020                  JSR          FinalTest
00002026                  MOVE.B       D1, D4
…
0000308A      FinalTest   MOVEM.W      D1-D3/A1-A3, -(SP)
0000308E      greater     MOVEA.L      #$1122, A3
…
00003098                  MOVE.B       D1, D2
…
000030CD                  CMP.L        D1, D3
000030D0                  BGT          greater
000030D2                  MOVE.B       #1, D3
…
00003144      exit        MOVEM.W      (SP)+, D1-D3/A1-A3
00003148                  RTS
```

After this instruction

How does the stack look like?

Coding Exercise 2

Write 68K assembly subroutine to calculate factorial of a long. D5 is used to pass the number to the subroutine, and D6 is used to store the result. Use recursion.