

cs330-13

Source file: 13Prob0633.pep

=====

;Caroline King #13

; Assignment 24

; Prob 0633

```
        BR        main
; main
guess:  .EQUATE 0           ;local variable #2d
main:   SUBSP     2,i        ; push #guess
        STRO     msgIn,d
        DECI     guess,s
        LDWX     guess,s
        ASLX
        BR       guessJT,x
guessJT: .ADDRSS  case0
        .ADDRSS  case0
        .ADDRSS  case2
        .ADDRSS  case3
case0:   STRO     msg0,d
        BR       endCase
case2:   STRO     msg2,d
        BR       endCase
case3:   STRO     msg3,d
        BR       endCase
endCase: LDBA     '\n',i
        STBA     charOut,d
        ADDSP    2,i        ;pop #guess
        STOP
msgIn:   .ASCII   "Pick a number 0...3: \x00"
msg0:    .ASCII   "Too low \x00"
msg2:    .ASCII   "Right on \x00"
msg3:    .ASCII   "Too high \x00"
        .END
```

Listing file: 13Prob0633.pepl

Addr	code	Object Symbol	Mnemon	Operand	Comment
					;Caroline King #13
					; Assignment 24
					; Prob 0633
0000	120003		BR	main	
					; main
		guess:	.EQUATE	0	;local variable #2d
0003	580002	main:	SUBSP	2,i	; push #guess
0006	490037		STRO	msgIn,d	
0009	330000		DECI	guess,s	
000C	CB0000		LDWX	guess,s	
000F	0B		ASLX		
0010	130013		BR	guessJT,x	
0013	001B	guessJT:	.ADDRSS	case0	
0015	001B		.ADDRSS	case0	
0017	0021		.ADDRSS	case2	
0019	0027		.ADDRSS	case3	
001B	49004D	case0:	STRO	msg0,d	
001E	12002D		BR	endCase	
0021	490056	case2:	STRO	msg2,d	
0024	12002D		BR	endCase	
0027	490060	case3:	STRO	msg3,d	
002A	12002D		BR	endCase	
002D	D0000A	endCase:	LDDBA	'\n',i	
0030	F1FC16		STBA	charOut,d	
0033	500002		ADDSP	2,i	;pop #guess
0036	00		STOP		
0037	506963	msgIn:	.ASCII	"Pick a number 0...3: \x00"	
	6B2061				
	206E75				
	6D6265				
	722030				
	2E2E2E				
	333A20				
	00				
004D	546F6F	msg0:	.ASCII	"Too low \x00"	
	206C6F				
	772000				
0056	526967	msg2:	.ASCII	"Right on \x00"	
	687420				
	6F6E20				
	00				
0060	546F6F	msg3:	.ASCII	"Too high \x00"	
	206869				
	676820				
	00				
006A			.END		

Symbol table

Symbol	Value	Symbol	Value
case0	001B	case2	0021
case3	0027	charOut	FC16
endCase	002D	guess	0000
guessJT	0013	main	0003
msg0	004D	msg2	0056
msg3	0060	msgIn	0037

Testing 13Prob0633.pep with input: 0  
Expected output: Too low  
=====  
Pick a number 0...3: Too low

Testing 13Prob0633.pep with input: 1  
Expected output: Too low  
=====  
Pick a number 0...3: Too low

Testing 13Prob0633.pep with input: 2  
Expected output: Right on  
=====  
Pick a number 0...3: Right on

Testing 13Prob0633.pep with input: 3  
Expected output: Too high  
=====  
Pick a number 0...3: Too high

```
cs330-13
Source file: 13Prob0639.pep
=====
;Caroline King #13
;Assignmnet 24
;Prob 0639

        BR      main
data:    .EQUATE 0          ;struct field #2d
next:    .EQUATE 2          ;struct field #2h
;
;***** main ()
first:   .EQUATE 8          ;local variable #2h
p:       .EQUATE 6          ;local variable #2h
first2:  .EQUATE 4          ;local variable #2h
p2:      .EQUATE 2          ;local variable #2h
value:   .EQUATE 0          ;local variable #2d
main:    SUBSP    6,i        ;push #first #p #value
        LDWA     0,i        ;first = 0
        STWA     first,s
        DECI     value,s    ;scanf("%d", &value);
while:   LDWA     value,s    ;while (value != -9999)
        CPWA     -9999,i
        BREQ     endWh
        LDWA     first,s    ;p = first
        STWA     p,s
        LDWA     4,i        ;first = (struct node *) malloc(sizeof(struct node))
        CALL     malloc    ;allocate #data #next
        STWX     first,s
        LDWA     value,s    ;first->data = value
        LDWX     data,i
        STWA     first,sfx
        LDWA     p,s        ;first->next = p
        LDWX     next,i
        STWA     first,sfx
        DECI     value,s    ;scanf("%d", &value)
        BR       while
endWh:   LDWA     first,s    ;for (p = first
        STWA     p,s
for:     LDWA     p,s        ;p != 0
        CPWA     0,i
        BREQ     endFor
        LDWX     data,i    ;printf("%d ", p->data)
        DECO     p,sfx
        LDBA     ' ',i
        STBA     charOut,d
        LDWX     next,i    ;p = p->next)
        LDWA     p,sfx
        STWA     p,s
        BR       for
endFor:  LDWA     0,i
        STWA     first2,s
        LDWA     0,i
        STWA     p2,s
        LDWA     first,s
        STWA     p,s
for2:    BREQ     endFor2
        LDWA     first2,s
        STWA     p2,s
        LDWA     4,i
        CALL     malloc
```

```

    STWX    first2,s
    LDWX    data,i
    LDWA    p,sfx
    LDWX    data,i
    STWA    first2,sfx
    LDWA    p2,s
    LDWX    next,i
    STWA    first2,sfx
    LDWX    next,i
    LDWA    p,sfx
    STWA    p,s
    BR      for2
endFor2: LDWA    first2,s
        STWA    p2,s
for3:   BREQ    endfor3
        LDWX    data,i
        DECO    p2,sfx
        LDBA    ' ',i
        STBA    charOut,d
        LDWX    next,i
        LDWA    p2,sfx
        STWA    p2,s
        BR      for3
endfor3: LDBA    '\n',i
        STBA    charOut,d
        ADDSP   6,i           ;pop #value #p #first
        STOP

;
;***** malloc()
;
;   Precondition: A contains number of bytes
;   Postcondition: X contains pointer to bytes
malloc: LDWX    hpPtr,d       ;returned pointer
        ADDA    hpPtr,d       ;allocate from heap
        STWA    hpPtr,d       ;update hpPtr
        RET
hpPtr:  .ADDRSS heap          ;address of next free byte
heap:   .BLOCK 1              ;first byte in the heap
        .END
```

Listing file: 13Prob0639.pepl

```

-----
      Object
Addr  code  Symbol  Mnemon  Operand  Comment
-----
      ;Caroline King #13
      ;Assignmmnet 24
      ;Prob 0639
0000  120003          BR      main
      data:      .EQUATE 0      ;struct field #2d
      next:      .EQUATE 2      ;struct field #2h
      ;
      ;***** main ()
      first:     .EQUATE 8      ;local variable #2h
      p:         .EQUATE 6      ;local variable #2h
      first2:    .EQUATE 4      ;local variable #2h
      p2:        .EQUATE 2      ;local variable #2h
      value:     .EQUATE 0      ;local variable #2d
0003  580006 main:     SUBSP   6,i      ;push #first #p #value
0006  C00000          LDWA     0,i      ;first = 0
0009  E30008          STWA     first,s
000C  330000          DECI     value,s      ;scanf("%d", &value);
000F  C30000 while:    LDWA     value,s      ;while (value != -9999)
0012  A0D8F1          CPWA     -9999,i
0015  18003F          BREQ     endWh
0018  C30008          LDWA     first,s      ;p = first
001B  E30006          STWA     p,s
001E  C00004          LDWA     4,i      ;first = (struct node *)
      malloc(sizeof(struct node))
0021  2400D6          CALL     malloc      ;allocate #data #next
0024  EB0008          STWX     first,s
0027  C30000          LDWA     value,s      ;first->data = value
002A  C80000          LDWX     data,i
002D  E70008          STWA     first,sfx
0030  C30006          LDWA     p,s      ;first->next = p
0033  C80002          LDWX     next,i
0036  E70008          STWA     first,sfx
0039  330000          DECI     value,s      ;scanf("%d", &value)
003C  12000F          BR      while
003F  C30008 endWh:    LDWA     first,s      ;for (p = first
0042  E30006          STWA     p,s
0045  C30006 for:      LDWA     p,s      ;p != 0
0048  A00000          CPWA     0,i
004B  180066          BREQ     endFor
004E  C80000          LDWX     data,i      ;printf("%d ", p->data)
0051  3F0006          DECO     p,sfx
0054  D00020          LDBA     ' ',i
0057  F1FC16          STBA     charOut,d
005A  C80002          LDWX     next,i      ;p = p->next)
005D  C70006          LDWA     p,sfx
0060  E30006          STWA     p,s
0063  120045          BR      for
0066  C00000 endFor:    LDWA     0,i
0069  E30004          STWA     first2,s
006C  C00000          LDWA     0,i
006F  E30002          STWA     p2,s
0072  C30008          LDWA     first,s
0075  E30006          STWA     p,s
0078  1800AB for2:    BREQ     endFor2
007B  C30004          LDWA     first2,s

```

```

007E E30002      STWA    p2,s
0081 C00004      LDWA    4,i
0084 2400D6      CALL    malloc
0087 EB0004      STWX    first2,s
008A C80000      LDWX    data,i
008D C70006      LDWA    p,sfx
0090 C80000      LDWX    data,i
0093 E70004      STWA    first2,sfx
0096 C30002      LDWA    p2,s
0099 C80002      LDWX    next,i
009C E70004      STWA    first2,sfx
009F C80002      LDWX    next,i
00A2 C70006      LDWA    p,sfx
00A5 E30006      STWA    p,s
00A8 120078      BR      for2
00AB C30004 endFor2: LDWA    first2,s
00AE E30002      STWA    p2,s
00B1 1800CC for3:  BREQ    endfor3
00B4 C80000      LDWX    data,i
00B7 3F0002      DECO    p2,sfx
00BA D00020      LDBA    ' ',i
00BD F1FC16      STBA    charOut,d
00C0 C80002      LDWX    next,i
00C3 C70002      LDWA    p2,sfx
00C6 E30002      STWA    p2,s
00C9 1200B1      BR      for3
00CC D0000A endfor3: LDBA    '\n',i
00CF F1FC16      STBA    charOut,d
00D2 500006      ADDSP   6,i          ;pop #value #p #first
00D5 00          STOP
;
;***** malloc()
;      Precondition: A contains number of bytes
;      Postcondition: X contains pointer to bytes
00D6 C900E0 malloc: LDWX    hpPtr,d      ;returned pointer
00D9 6100E0      ADDA    hpPtr,d      ;allocate from heap
00DC E100E0      STWA    hpPtr,d      ;update hpPtr
00DF 01          RET
00E0 00E2 hpPtr:  .ADDRSS heap      ;address of next free byte
00E2 00 heap:    .BLOCK 1          ;first byte in the heap
00E3              .END

```

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# Symbol table

Symbol	Value	Symbol	Value
charOut	FC16	data	0000
endFor	0066	endFor2	00AB
endWh	003F	endfor3	00CC
first	0008	first2	0004
for	0045	for2	0078
for3	00B1	heap	00E2
hpPtr	00E0	main	0003
malloc	00D6	next	0002
p	0006	p2	0002
value	0000	while	000F



```
Testing 13Prob0639.pep with input:
10 20 30 40 50 -9999
Expected output:
50 40 30 20 10
10 20 30 40 50
=====
50 40 30 20 10 10 20 30 40 50
```

