

CPS111 Homework Answers Chapter 1

p.34 - 3, 4, 9

p.35 – 1

p. 34 #3

m=3 a2=1 a1=4 a0=9
b2=0 b1=2 b0=9

Step	i	c3	c2	c1	c0	carry
1						0
2	0					
4					18	
5					8	1
6	1					
4				7		
5						0
6	2					
4			1			
5						0
6	3					
7		0				
8						PRINT: 0178

p.34 #4

One solution:

- Step 8 Set the value of i to m
- Step 9 Set the value of $flag$ to *false*
- Step 10 While the value of i is greater or equal to 1, repeat steps 11 through 12
- Step 11 If c_i is not equal to zero then print c_i & set $flag$ to *true*
else if $flag$ is equal to *true* then print 0
- Step 12 Subtract 1 from the value of i
- Step 13 print c_0 (always print this digit no matter what)

p.34 #9

Algorithm:

- Step 1 input the value of a
- Step 2 input the value of b
- Step 3 set the value of $result$ to 0
- Step 4 While a is greater than 0 then repeat step 5 through 6
- Step 5 set the value of $result$ to $result + b$

Step 6 Subtract 1 from the value of a
 Step 7 print the value of $result$

TRACE of Algorithm

$a = 3$ $b = 4$

Step	a	b	result
1	3		
2		4	
3			0
5			4
6	2		
5			8
6	1		
5			12
6	0		
7			Display 12

p.35 #1

Examples:

$$\begin{array}{r} 1234 \\ - 1125 \\ \hline 109 \end{array}$$

$$\begin{array}{r} 1005 \\ - 996 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 1050 \\ - 996 \\ \hline 54 \end{array}$$

Note: m is the number of digits in the numbers.

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Step 1  input the value of  $a$ 
Step 2  input the value of  $b$ 
Step 3  set the value of  $c$  to 0
Step 4  set the value of  $i$  to 0
Step 5  While  $i$  is less than  $m$  then repeat steps 6 through 14
Step 6    if  $a_i$  is less than  $b_i$  then perform steps 7 through 12
Step 7      set the value of  $place$  to  $i+1$ 
Step 8      while  $a_{place}$  is equal to 0 then repeat steps 9 through 10
Step 9        set the value of  $a_{place}$  to 9
Step 10       add 1 to  $place$ 
Step 11       subtract 1 from the value of  $a_{place}$ 
Step 12       add 10 to the value of  $a_i$ 
Step 13     set the value of  $c_i$  to  $a_i - b_i$ .
Step 14     add 1 to the value of  $i$ 
Step 15 Stop

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1234	a	m=4
- 1125	b	
<u>109</u>		

[illegible]

Trace of example (assuming a is greater than b)

1005

a

 $m=4$

- 996

b

9

[illegible]

$$\begin{array}{r} 1050 \\ - 996 \\ \hline 9 \end{array}$$
[illegible]