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CE6305-501

Homework5

1. Time iterative multiply for 23×25

```
 C      u        v
---  ------    ------
 0   000000    011001  m'pr lsb =1 so add:
+    010111
 --  ------    ------
 0   010111    011001  shift:
 0   001011    101100  m'pr lsb =0 so just shift:
 0   000101    110110  m'pr lsb =0 so just shift:
 0   000010    111011  m'pr lsb =1 so add:
+    010111
 --   ------   ------
 0   011001    111011  shift:
 0   001100    111101  m'pr lsb =1 so add:
 +   010111
 --   ------   ------
 0   100011    111101  shift:
 0   010001    111110  m'pr lsb =0 so just shift:

 0   001000    111111  = 575
```

2. Time iterative multiply for 25×23

```
 C      u        v
---  ------    ------
 0   000000    010111  m'pr lsb =1 so add:
+    011001
 --  ------    ------
 0   011001    010111  Shift:
 0   001100    101011  m'pr lsb =1 so add:
+    011001
 --  ------    ------
 0   100101    101011  shift:
 0   010010    110101  m'pr lsb =1 so add:
+    011001
 --  ------    ------
 0   101011    110101  shift:
 0   010101    111010  m'pr lsb =0 so just shift:
 0   001010    111101  m'pr lsb =1 so add:
+    011001
 --  ------    ------
 0   100011    111101  shift:
 0   010001    111110  m'pr lsb =0 so just shift:

 0   001000    111111  = 575
```

3. Time iterative multiply for -23×25

```
  C      u        v
---  ------    ------
 0   000000    011001  m'pr lsb =1 so add:
+    101001
 --  ------    ------
 1   101001    011001  Shift:
     110100    101100  m'pr lsb =0 so just shift:
     111010    010110  m'pr lsb =0 so just shift:
     111101    001011  m'pr lsb =1 so add:
+    101001
 --  ------    ------
 1   100110    001011  shift:
     110011    000101  m'pr lsb =1 so add:
+    101001
 --  ------    ------
 1   011100    000101  shift:
     101110    000010  m'pr lsb =0 so just shift:

 1   110111    000001  = -575
```

4. 25×-23 (by subtracting multiplicand)

```
  C      u        v
---  ------    ------
 0   000000    101001  m'pr lsb =1 so add:
+    011001
 --  ------    ------
 0   011001    101001  Shift:
 0   001100    110100  m'pr lsb =0 so just shift:
 0   000110    011010  m'pr lsb =0 so just shift:
 0   000011    001101  m'pr lsb =1 so add:
+    011001
 --  ------    ------
 0   011100    001101  shift:
 0   001110    000110  m'pr lsb =0 so just shift:
 0   000111    000011  m'pr lsb =1 so add:
+    011001
 --  ------    ------
 0   100000    000011  shift:
 0   010000    000001  = 1041. Subtract m'cand from U
-    011001
 --  ------    ------
 1   110111    000001  = -575
```

5. 25×-23 (subtract the multiplicand in the last iteration when the multiplier is negative.)

```
  C      u        v
---  ------    ------
 0   000000    101001  m'pr lsb =1 so add:
+    011001
 --  ------    ------
 0   011001    101001  Shift:
 0   001100    110100  m'pr lsb =0 so just shift:
 0   000110    011010  m'pr lsb =0 so just shift:
 0   000011    001101  m'pr lsb =1 so add:
+    011001
 --  ------    ------
 0   011100    001101  shift:
 0   001110    000110  m'pr lsb =0 so just shift:
 0   000111    000011  m'pr lsb =1 so subtract:
-    011001
 --  ------    ------
 1   101110    000011  shift:
 0   110111    000001  = -575
```

6. -25×-23

```
  C      u        v
---  ------    ------
 0   000000    101001  m'pr lsb =1 so add:
+    100111
 --  ------    ------
 1   100111    101001  Shift:
 1   110011    110100  m'pr lsb =0 so just shift:
 1   111001    111010  m'pr lsb =0 so just shift:
 1   111100    111101  m'pr lsb =1 so add:
+    100111
 --  ------    ------
 1   100011    111101  shift:
 1   110001    111110  m'pr lsb =0 so just shift:
 1   111000    111111  m'pr lsb =1 so subtract:
-    100111
 --  ------    ------
 0   010001    111111  shift:
     001000    111111  = 575
```