

Repetition Examples

WHILE EXAMPLES

Example 1

- Find the average of set of exam scores. Allow user to enter any number of scores; stop and report the average when a negative score is entered.

Example 2

- Write a program that allows the user to enter a set of values. When the user enters zero it should stop and report the number of positive and the number of negative values entered.
 - 5, 3, -7, 2, -4, 0 → 3 positive & 2 negative values entered.
 - 0 → 0 positive & 0 negative values entered.
 - 9, 2, 8, 0 → 3 positive & 0 negative values entered.
 - -4, -8, -3, -5, 0 → 0 positive & 4 negative values entered.

Example 2 – Count Positive and Negative

- The main idea is top-down design using the pattern
 1. find the noOfPos & noOfNeg values in a set of values read from the user & terminated by 0.
 2. Report noOfPos & noOfNeg values entered.
- Recognize 0 as a case of sentinel-controlled input:

Read value

While value is not sentinel

Process value

Read value

- If value is positive then add 1 to noOfPos else add 1 to noOfNeg
 - add “noOfPos = 0” and “noOfNeg = 0” before loop
- Extract data/memory requirements
 - noOfPos, noOfNeg, value – int variables
 - SENTINEL – int constant = 0

Example 2 - Demo

- See CountPosNeg.java

Example 3

- Allow user to enter a limit value, followed by a set of positive values terminated by a zero. After the user enters zero, print a message to say whether any of the values exceeded the given limit or not.

```
Enter limit: 8
Enter values (0 to stop):
5
2
7
4
0
Limit NOT exceeded.
```

```
Enter limit: 10
Enter values (0 to stop):
3
12
7
14
6
0
Limit WAS exceeded.
```

Example 3 - Over Limit

1. Ask for & get limitValue
 2. Read a set of positive values terminated by zero
(& using limitValue find if limitExceeded)
 3. if limitExceeded then
 print "Limit WAS exceeded"
else
 print "Limit NOT exceeded"
- Extract data/memory requirements
 - limitValue – int variable
 - limitExceeded – boolean variable

Over Limit - Demo

- See `OverLimit.java`

Example 4

- Allow the user to enter a set of positive values & report whether they were in ascending order or not.
- See `AscendingOrder.java`

Example 5

- Write a program (using while) that asks the user to enter an integer number N, then prints a triangle with N lines of stars or numbers. For example, if N is 4
- See Triangle.java

```
  *
 * * *
* * * * *
* * * * * * *
```

```
  1
 222
33333
4444444
```

Hint: Each level i will have $2*i - 1$ stars
Level i will have $(N-i)$ blank spaces before the star(s)

FOR EXAMPLES

Example 6

- Write a program (using for) that asks the user to enter an integer number N, then prints a triangle with N lines of stars or numbers. For example, if N is 4

```
  *
 * * *
* * * * *
* * * * * * *
```

```
* * * * * * *
 * * * * *
  * * *
   *
```

```
  1
 222
33333
44444444
```

```
  1
 212
32123
4321234
```

```

class triangle
{
    public static void main(String args[])
    {
        for (int i=0; i<4; i++)
        {
            for (int k=0; k<4-i; k++)
            {
                System.out.print(" ");

                for (int j=0; j<i*2+1; j++)
                {
                    System.out.print("*");
                }

                System.out.println("");
            }
        }
    }
}

```

Try doing using while

Example 7

- Ask the user for their name, print it out one character per line, then print “done”.

Enter your name: David

D

a

v

i

d

done.

```
print 1st   char in name
      " 2nd   "   "   "
      " 3rd   "   "   "
      " :     "   "   "
      " last  "   "   "
```

Example 7

- Ask the user for their name, print it out one character per line, then print “done”.

Enter your name: David

D

a

v

i

d

done.

```
for (index = 0; index < name.length(); index++)  
    System.out.println( name.charAt( index) );
```

```
for index = 0 to _____  
    print charAt index in name
```

```
print 1st   char in name  
"    2nd   "    "    "  
"    3rd   "    "    "  
"    :     "    "    "  
"    last  "    "    "
```

```
print charAt 0 in name  
"    "    1    "    "  
"    "    2    "    "  
"    "    :    "    "  
"    "    last "    "
```


Example 7

- Ask the user for their name, print it out one character per line, then print “done”.

```
Enter your name: David
D
a
v
i
d
done.
```



```
Enter your name: David
d
i
v
a
D
done.
```

Finally...

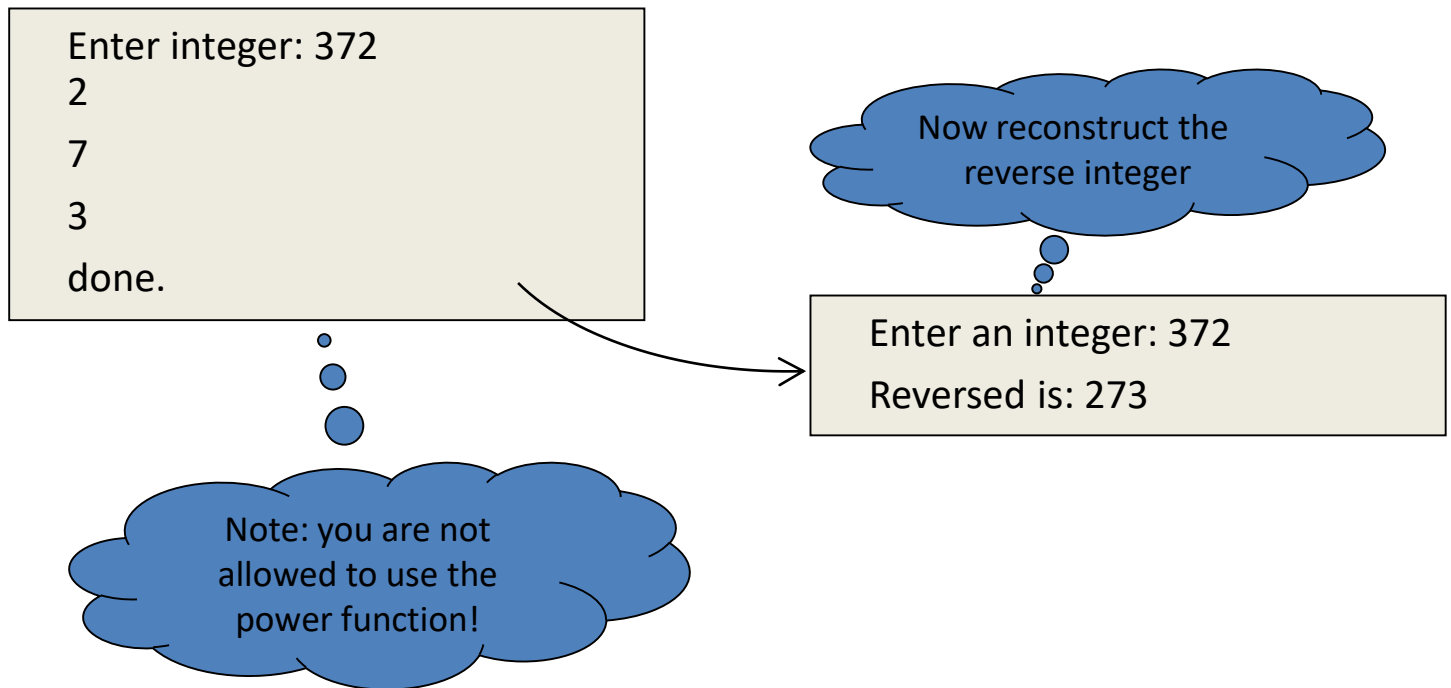
From either sequence of characters,
construct a String, reverseName

Example 7 - Demo

- See ForPlay

Example 8

- Given an integer, print its digits in reverse sequence, one per line.



DO WHILE EXAMPLES

Data entry validation

- See DoWhilePlay