

CSCI 520
Homework 11

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1-3 *Modify the temperature conversion program to print a heading above the table.*

If we wish to have the Temperature program include a header in its output table, then we should print the header before the table is constructed. This can be accomplished by adding a “printf” statement before the “while” loop. We see this done in the below code.

Modified Temperature Program:

```
#include <stdio.h>
/* print Fahrenheit-Celsius table
   for fahr = 0,20,...,300; floating point version */
main()
{
    float fahr, celsius;
    int lower, upper, step;

    lower = 0; /* lower limit of temperature table*/
    upper = 300; /* upper limit */
    step =20; /*step size*/

    fahr = lower;
    printf("Fahrenheit, Celsius\n");
    while (fahr <= upper) {
        celsius = (5.0/9.0) * (fahr-32.0);
        printf("%10.0f %8.1f\n", fahr, celsius);
        fahr = fahr + step;
    }
}
```

Output:

```
Fahrenheit, Celsius
    0    -17.8
   20    -6.7
   40     4.4
   60    15.6
   80    26.7
  100    37.8
  120    48.9
  140    60.0
  160    71.1
  180    82.2
  200    93.3
  220   104.4
  240   115.6
  260   126.7
  280   137.8
  300   148.9
```

We see here that not only has a header been added, but the spacing was also adjusted to align the numbers to the right.

1-5 *Modify the temperature conversion program to print the table in reverse order, that is from 300 degrees to 0.*

In order to have the program print the table in the reverse order, we can either have the program calculate the values in reverse or reverse the values after they are calculated. For simplicity, we have chosen to calculate the values in reverse order. This is achieved by interchanging the “lower” and “upper” designations and subtracting the “step” value instead of adding it.

Modified Temperature Program:

```
#include <stdio.h>
/* print Fahrenheit-Celsius table
   for fahr = 0,20,...,300; floating point version */
main()
{
    float fahr, celsius;
    int lower, upper, step;

    lower = 0; /* lower limit of temperature table*/
    upper = 300; /* upper limit */
    step =20; /*step size*/

    fahr = upper;
    printf("Fahernheit Celsius\n");
    while (fahr <= upper, fahr >= lower) {
        celsius = (5.0/9.0) * (fahr-32.0);
        printf("%10.0f %8.1f\n", fahr, celsius);
        fahr = fahr - step;
    }
}
```

Output:

Fahrenheit	Celsius
300	148.9
280	137.8
260	126.7
240	115.6
220	104.4
200	93.3
180	82.2
160	71.1
140	60.0
120	48.9
100	37.8
80	26.7
60	15.6
40	4.4
20	-6.7
0	-17.8

We see here that the output has been reversed by making small adjustments to the while loop.

1-7 Write a program to print the value of EOF.

In order to have the program print the End of Function value, we must incorporate a print statement after the while loop.

Modified Code:

```
#include <stdio.h>
/* copy input to output; 2nd version */
main()
{
    int c;

    while((c=getchar())!= EOF)
        putchar(c);

    printf("EOF == %d\n", EOF);
}
```

Output:

EOF == -1

We see here that the function has been modified to print the End-of-Function value, which is -1 in this instance.