

## Lab 3 : The arrays

1. The following program fragment prints the digits of the number 'x' in base three, but in reverse order:

```
int x = 22;

while (x > 0) {

    printf("%d", x % 3);

    x = x / 3;

}

printf("\n");
```

For example, if x is 22, which is represented as 211 in base 3, the program will output "112". Write a small program that includes this program fragment, and verify that it will print "112" when x is set to 22.

2. Do you understand the algorithm? If not, consider the same algorithm but replace each '3' with '10'. It will print the digits of x (in base 10) in reverse order. Try it if you are not completely sure, and then see if you understand the base 10 algorithm.
3. Modify your program from the previous exercise so that it uses an array to store each digit of the base three representation of the number. Then print out the digits in the correct order. Verify that your program will now print "211" when x is set to 22.

Out-of-bounds Array Indices:

4. Write a program that prompts for and accepts three numbers from the user, storing them in a 3-element array. Your program should then ask the user for an index number, check whether the given index is valid, and either print out the value stored at the given location or print an error message (if the index is invalid).

Once the program is working correctly, modify it so that it does not verify the correctness of the array index. What happens when you enter inappropriate index values? You may want to try reasonably small errors (say index=3) as well as ridiculous indices (say index=123456789). Do you understand the results that you get?