

Extra Exercise: Java

1. The following function is defined:

```
public int foo(int[] arr)
{
    int m = arr[0];
    for (int i=0; i<arr.length; i++)
    {
        if (arr[i] > m)
            m = arr[i];
    }
    return m;
}
```

- (a) What will be the returned value of **foo** for the array $\text{arr} = [2, -3, 3, 4, -7]$?
 (b) What operation does the function perform?
 (c) How will the answer change if instead of

```
if (arr[i] > m)
```

the code would be

```
if (arr[i] < m)
```

?

2. The following function is defined:

```
public boolean bar(int n)
{
    if (n < 2 || (n % 2 == 0 && n != 2))
        return false;

    int i = 3;
    while (i < n)
    {
        if (n % i == 0)
            return false;
        i = i + 2;
    }
    return true;
}
```

Note: the operator `||` means 'or' (like `&&` is 'and'), and the operator `%` is the modulo operator (i.e. it returns the remainder of the division. For example $3\%2 = 1$, $4\%2 = 0$).

- (a) What are the returned values of **bar** for the following numbers: $-3, 1, 2, 3, 4, 5, 9, 11, 16$?
 (b) Which operation does the function perform?

3. The following function is defined:

```
public int baz(int n)
{
    int x = 1;
    for (i=1; i<=n; i++)
    {
        x = x * i;
    }
    return x;
}
```

- (a) What are the returned values of **baz** for the following numbers: $1, 2, 3, 4, 5$?
Note: `i++` means $i = i + 1$ (i.e. it increases i by one).

- (b) Which operation does the function perform?