Algorithms

What is an algorithm?

An algorithm is a procedure, recipe, process to accopmplish a task. It takes value as input and delivers a value as output.

How to develop an algortihm?

The development of an algorithm has four crucial steps:

1. **Specifiaction**: Be clear what the problem is
2. **Design**: Specify structure of the solution, usually in pseudcode
3. **Development**: Convert pseudocode in chosen language (C, Python, Java etc.)
4. **Testing**: if all inputs deliver all necessary outputs

Example: Linear search in Pseudocode

```
                                  # Linear search last occurence
p = NIL;                          # Here we are defining our variable p as 0
for i = 1 to n do                 # For the range of 1 to n in our array A
    if A[i]==v then p=i;          # we are checking the values (v)
return p;                         # If we find a value which matches our input
                                  # we set it equal to p and return it
```

```
                                          # Linear search first occurence
i = 1;                                    # Set i to 1. While i is less
while i <= n and A[i] != v do i++;        # or equal number of array elements
if i <= n then return i;                  # and there is no match in value
else return NIL;                          # with the array, keeping adding 1.
                                          # If I is less or equal n, return n
                                          # else return 0.
```

Prime number filter

Sorting algotihms

Bubble sort

Selection sort

Insertion sort