

```

> #FOR LOOPS
> #A very simple for loop
for i from 1 to 10 do
  print(i);
end do;
1
2
3
4
5
6
7
8
9
10
(1)

> #loop in increments of more than 1
for i from 1 to 10 by 2 do
  print(i);
end do;
1
3
5
7
9
(2)

> #add a while-condition to the for loop
for i from 1 to 10
while i < 5 do print(i);
end do;
1
2
3
4
(3)

> # a loop that counts down
for i from 10 to 1 by -1 do
  print(i);
end do;
> #create a list with zeroes
my_list := [seq(0, i=1..10)];
my_list := [0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
(4)

> #check the number of elements in the list
nops(my_list);
10
(5)

> #fill the list with powers of 2
for i from 1 to nops(my_list) do
  my_list[i] := 2i;

```

end do;

```
my_list1 := 2  
my_list2 := 4  
my_list3 := 8  
my_list4 := 16  
my_list5 := 32  
my_list6 := 64  
my_list7 := 128  
my_list8 := 256  
my_list9 := 512  
my_list10 := 1024
```

(6)

```
> my_list,  
[2, 4, 8, 16, 32, 64, 128, 256, 512, 1024]
```

(7)

```
> my_list2;  
4
```

(8)

```
> #write a (somewhat) inefficient version of myprime  
myIsprime := proc(n :: integer)
```

```
local i, result;  
result := true;
```

```
for i from 2 to trunc( $\frac{n}{2}$ ) do
```

```
if irem(n, i) = 0 then result := false;
```

```
end if;
```

```
end do;
```

```
return result ;
```

```
end proc;
```

```
myIsprime := proc(n::integer)
```

(9)

```
local i, result;
```

```
result := true;
```

```
for i from 2 to trunc(1/2 * n) do if irem(n, i) = 0 then result := false end if end do;
```

```
return result
```

```
end proc
```

```
> myIsprime(231);  
false
```

(10)

```
> #write our version of factorial
```

```
> myfactorial := n → mul(i, i = 1 ..n);
```

```
myfactorial := n → mul(i, i = 1 ..n)
```

(11)

```
> myfactorial(5);  
120
```

(12)

```
> myfactorial2 := proc(n)
```

```
local result, i;
```

```
result := 1;
```

```
for i from 1 to n do
  result := result*i;
end do;
return result;
end proc;
```

```
myfactorial2 := proc(n) (13)
```

```
  local result, i;
  result := 1; for i to n do result := result*i end do; return result
```

```
end proc
```

```
> myfactorial2(5); 120 (14)
```

```
> #What is the difference between
```

```
> for i from 10 to 1 by -1
  while i > 5 do
    print(i);
  end do;
```

```
10
9
8
7
6 (15)
```

```
> #and
```

```
> for i from 10 to 1 by -1 do
  if i > 5 then print(i);
  end if;
end do;
```

```
10
9
8
7
6 (16)
```

```
>
```