file =

```
file = readlines("day_3.txt")
```

Getting all tree positions on the original map

world =

```
world = Dict()
```

```
for (index,line) in enumerate(file)
    trees = eachmatch(r"#",line)

    trees_pos = map(x-> x.offset, trees)

    for pos in trees_pos
        world[(index-1,pos-1)] = true
    end
end
```

```
world
```

extending the map to all positions

```
md"extending the map to all positions"
```

```
begin
    tam_column = size(file)[1]
    tam_row = length(file[1])  #the \n ocupy one space

    has_tree(x::Int64,y::Int64) = haskey(world, ( x,y % tam_row))
end
```

```
tam_column
```

```
tam_row
```

toboggan_pos =

```
toboggan_pos = [(x,3*x) for x in 1:tam_column-1]
```

```
[has_tree(x,y) for (x,y) in toboggan_pos]
```

```
sum([has_tree(x,y) for (x,y) in toboggan_pos])
```

Question 2

```
md"# Question 2"
```

```
slope(dx,dy) = sum([has_tree(x,Int64(dy/dx*x)) for x in 0:dx:tam_column-1])
```

```
slope(1,3)
```

- `slope(1,1)*slope(1,3)*slope(1,5)*slope(1,7)*slope(2,1)`

- `[slope(1,1),slope(1,3),slope(1,5),slope(1,7),slope(2,1)]`