HoP101: Session 3

Getting started with building

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In [55]:
```python
# A B C D E

# 0 -> susceptible
# 1 -> infected
# 2 -> recovered

# T = 0

# LOUSY WAY TO STORE DATA: (We will see why)
# a = 0
# b = 0
# c = 0
# d = 1
# e = 0

# Better way using lists:

state = [0, 0, 0, 1, 0]
#        a  b  c  d  e
```

In [56]:
```python
# T = 1

# If you are susceptible, and have a infected neighbour, you have a 50% chance of l
k = 0.5 # chance of infection

import random

# LOUSY WAY TO CODE: (What if we had a thousand agents!?)
#
# a_new = a
# b_new = b
# c_new = c
# d_new = d
# e_new = e

# if a == 0:
#     if b == 1:
#         if random.random() < k:
```

```python
#              a_new = 1
#         else:
#              a_new = 0

# if e == 0:
#     if e == 1:
#         if random.random() < k:
#             e_new = 1
#         else:
#             e_new = 0

# if b == 0:
#     prob = 1 - (1 - k * (a == 1)) * (1 - k * (c == 1)) # probability of being inf
#     if random.random() < prob:
#         b_new = 1


# if c == 0:
#     prob = 1 - (1 - k * (b == 1)) * (1 - k * (d == 1)) # probability of being inf
#     if random.random() < prob:
#         c_new = 1


# if d == 0:
#     prob = 1 - (1 - k * (c == 1)) * (1 - k * (e == 1)) # probability of being inf
#     if random.random() < prob:
#         d_new = 1

# Better way to code using lists and loops:

new_state = state.copy()

if state[0] == 0:
    if state[1] == 1:
        # probability?
        new_state[0] = 1

if state[len(state) - 1] == 0:
    if state[len(state) - 2] == 1:
        # probability?
        new_state[len(state) - 1] = 1

i = 1
while i < len(state) - 1:
    if state[i] == 0:
        prob = 1 - (1 - k * (state[i-1] == 1)) * (1 - k * (state[i + 1] == 1)) # p
        if random.random() < prob:
            new_state[i] = 1

    i = i + 1

# TODO: DEAL WITH RECOVERY

state = new_state.copy()

print(state)
```

```
[0, 0, 0, 1, 1]
```

In [47]:
```python
# Demo on Lists:

my_list = ["a", "b", "c"]

# i = 0
```

```python
# while i < 3:
#     print(my_list[i])
#     i = i + 1

my_list[1] = "X"
my_list.append("P")

for x in my_list:
    print(x)

print(len(my_list))
```

```
a
X
c
P
4
```