

# Μικροεπεξεργαστές

## Άσκηση 1η

### Δυναμική Κατανάλωση Ισχύος - Switching Activity

#### Άσκηση 1.1

```
With 10 inputs pi=3.200000
With 100 inputs pi=3.240000
With 1000 inputs pi=3.072000
With 4178 inputs pi=3.160364
With 10000 inputs pi=3.142400
>> MCpi
With 10 inputs pi=3.600000
With 100 inputs pi=3.080000
With 1000 inputs pi=3.080000
With 4178 inputs pi=3.166108
With 10000 inputs pi=3.140400
```

Όσο το πλήθος των σημείων αυξάνεται τόσο η τιμή του  $\pi$  πλησιάζει με μεγαλύτερη ακρίβεια στην πραγματική τιμή που θα έπρεπε να έχει.

#### Άσκηση 1.2

```
>> MCOR4(10)
MonteCarloSize = 10
switchesNumber = 3
vectorsNumber = 10
switching activity for 10 inputs is: 0.300000
ans = 0.3000
>> MCOR4(100)
MonteCarloSize = 100
switchesNumber = 9
vectorsNumber = 100
switching activity for 100 inputs is: 0.090000
ans = 0.090000
>> MCOR4(1000)
MonteCarloSize = 1000
switchesNumber = 123
vectorsNumber = 1000
switching activity for 1000 inputs is: 0.123000
ans = 0.1230
>> MCOR4(4178)
MonteCarloSize = 4178
switchesNumber = 427
vectorsNumber = 4178
switching activity for 4178 inputs is: 0.102202
ans = 0.1022
```

Όσο το πλήθος των σημείων αυξάνεται τόσο η τιμή του switching activity πλησιάζει στο 0.1 όπως προκύπτει και η πιθανότητα.

### Άσκηση 1.3

```
>> signalprobs(1,0)
number of inputs: 2
-----> 2 inputs gates for input probabilities (1.000000 0.000000):
AND Gate for input probabilities (1.000000 0.000000):
signal probability is 0.000000 and switching activity is 0.000000
OR Gate for input probabilities (1.000000 0.000000):
signal probability is 1.000000 and switching activity is 0.000000
XOR Gate for input probabilities (1.000000 0.000000):
signal probability is 1.000000 and switching activity is 0.000000
NAND Gate for input probabilities (1.000000 0.000000):
signal probability is 1.000000 and switching activity is 0.000000
NOR Gate for input probabilities (1.000000 0.000000):
signal probability is 0.000000 and switching activity is 0.000000
>> signalprobs(1,0,0)
number of inputs: 3
-----> 3 inputs gates for input probabilities (1.000000 0.000000 0.000000):
AND Gate for input probabilities (1.000000 0.000000 0.000000):
signal probability is 0.000000 and switching activity is 0.000000
OR Gate for input probabilities (1.000000 0.000000 0.000000):
signal probability is 1.000000 and switching activity is 0.000000
XOR Gate for input probabilities (1.000000 0.000000 0.000000):
signal probability is 1.000000 and switching activity is 0.000000
NAND Gate for input probabilities (1.000000 0.000000 0.000000):
signal probability is 1.000000 and switching activity is 0.000000
NOR Gate for input probabilities (1.000000 0.000000 0.000000):
signal probability is 0.000000 and switching activity is 0.000000

>> signalprobs(1,0,0,1)
number of inputs: 4
-----> N inputs gates
AND Gate
signal probability is 0.000000 and switching activity is 0.000000
OR Gate
signal probability is 1.000000 and switching activity is 0.000000
XOR Gate
signal probability is 0.000000 and switching activity is 0.000000
NAND Gate
signal probability is 1.000000 and switching activity is 0.000000
NOR Gate
signal probability is 0.000000 and switching activity is 0.000000
```

```
>> signalprobs(0.5,0.5,0.5,0.5)
number of inputs: 4
-----> N inputs gates
AND Gate
signal probability is 0.062500 and switching activity is 0.117188
OR Gate
signal probability is 0.937500 and switching activity is 0.117188
XOR Gate
signal probability is 0.500000 and switching activity is 0.500000
NAND Gate
signal probability is 0.937500 and switching activity is 0.117188
NOR Gate
signal probability is 0.062500 and switching activity is 0.117188
>>
```