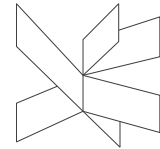


Mandatory Assignment

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1 Calculate the delays

1.1 Calculate the delay. The clock frequency is 16MHz

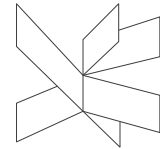
```
delay:
ldi r20, 86
loop1:
dec r20
brne loop1
```

1.2 Calculate the delay. The clock frequency is 16MHz

```
delay:
ldi r20, 100
loop1:
nop
dec r20
brne loop1
nop
nop
```

1.3 Calculate the delay. The clock frequency is 16MHz

```
delay:
ldi r20, 200
loop1:
nop
dec r20
nop
nop
brne loop1
nop
nop
```



1.4 Calculate the delay. The clock frequency is 16MHz

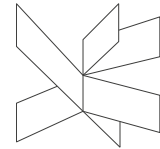
```
delay:
ldi r18, 180
loop2:
ldi r20, 199
loop1:
dec r20
brne loop1
dec r18
brne loop2
```

1.5 Calculate the delay. The clock frequency is 16MHz

```
delay:
ldi r18, 11
loop2:
nop
ldi r20, 15
loop1:
nop
nop
dec r20
nop
brne loop1
nop
nop
dec r18
brne loop2
nop
nop
nop
```

1.6 Calculate the delay. The clock frequency is 16MHz

```
delay:
ldi r16, 14
loop3:
ldi r18, 11
loop2:
ldi r20, 15
loop1:
dec r20
brne loop1
dec r18
brne loop2
dec r16
brne loop3
```



1.7 Calculate the delay. The clock frequency is 16MHz

```
delay:
ldi r16, 14
loop3:
nop
ldi r18, 110
loop2:
nop
ldi r20, 150
loop1:
dec r20
brne loop1
nop
nop
dec r18
brne loop2
dec r16
nop
brne loop3
nop
nop
nop
```

2 Create delays

2.1 Your microcontroller is connected to a 16MHz clock. Create a delay that is around 10 μ s (+- 5%):

2.2 Your microcontroller is connected to a 16MHz clock. Create a delay that is around 168 μ s (+- 5%):

2.3 Your microcontroller is connected to a 16MHz clock. Create a delay that is around 1ms (+- 5%):