

### Assignment 3

#### Theory Assignment:

1.  $T_1(15, 1, 14)$   $T_2(20, 2, 26)$   $T_3(22, 3)$

Resulting frame size

we have tasks:

$$T_1(15, 1, 14), T_2(20, 2, 26), T_3(22, 3, 22)$$

: Requirement 1:  $f \geq 3$

Requirement 2:

$$\lfloor P_i/f \rfloor - P_i/f = 0$$

so

we must have  $f = 3, 4, 5, 10, 11, 15, 20, 22$

Requirement 3:

$$2f - \gcd(P_i, f) \leq D_i$$

	$f$	$2f - \gcd(P_i, f) \leq D_i$	
$i=1$	3	$2 \times 3 - \gcd(15, 3) \leq 14$ (TRUE)	$\Rightarrow$ so $f=3$ satisfies all conditions
$i=2$	3	$2 \times 3 - \gcd(20, 3) \leq 26$ (TRUE)	
$i=3$	3	$2 \times 3 - \gcd(22, 3) \leq 22$ (TRUE)	

3.  $T_1(5, 0.1)$   $T_2(7, 1)$   $T_3(12, 6)$   $T_4(45, 9)$

we have task sets

$$T_1(5, 0.1), T_2(7, 1), T_3(12, 6), T_4(45, 9)$$

or

$$T_1(5, 0.1, 5), T_2(7, 1, 7), T_3(12, 6, 12), T_4(45, 9, 45)$$

Requirement 1:

$$f > 9$$

but we cannot have a frame size larger than period ( $T_1=5$ ).

so we have to break task  $T_3$  &  $T_4$ .

$$T_3(12, 6) \Rightarrow (12, 3), (12, 3)$$

$$T_4(45, 9) \Rightarrow (45, 3), (45, 3), (45, 3)$$

so  $f > 3$

Requirement 2:

$$f = 1, 2, 3, 4, 5, 6, 7, 9, 12, 15, 45$$

$$f = 3$$

$$2 \times 3 - \gcd(3, 5) \leq 5 \quad (\text{True})$$

$$2 \times 3 - \gcd(3, 7) \leq 7 \quad (\text{True})$$

$$2 \times 3 - \gcd(3, 12) \leq 12 \quad (\text{True})$$

$$2 \times 3 - \gcd(3, 45) \leq 45 \quad (\text{True})$$

so

$f = 3$



2.  $T_1(4, 1)$   $T_2(5, 2, 7)$   $T_3(20, 5)$

$T_1(4, 1)$  ,  $T_2(5, 2, 7)$  ,  $T_3(20, 5)$   
or  
 $T_1(4, 1, 4)$  ,  $T_2(5, 2, 7)$  ,  $T_3(20, 5, 20)$

Requirement 1:

$$f \geq 5$$

but we cannot have a frame size larger than period ( $T_1 \rightarrow 4$ )

dividing  $T_3$  as

$$T_3 \Rightarrow (20, 1), (20, 3), (20, 1)$$

similarly

we get

$$f = 4$$