Assignment 2 Team 5

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Task 1

a)

b)

i)

Hyperperiod $H = lcm(20, 24, 30, 32, 28, 27, 35, 21, 42, 36) = 30240$

ii)

Possible frame sizes are
$F \in \{2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 24, 27, 28, 30, 32, 35, 36, 40, 42, 45, 48, 54, 57,$
$60, 63, 70, 72, 80, 84, 90, 96, 105, 108, 112, 120, 126, 135, 140, 144, 160, 168, 180, 189, 210, 216, 224,$
$240, 252, 270, 280, 288, 315, 336, 360, 378, 420, 432, 480, 504, 540, 560, 630, 672, 720, 756, 840, 864,$
$945, 1008, 1080, 1120, 1260, 1440, 1512, 1680, 1890, 2016, 2160, 2520, 3024, 3360, 3780, 4320, 5040,$
$6048, 7560, 10080, 15120\}$
Which are 94 possibilities without taking into account the 1 and the 30240.

iii)

Smallest frame size F which satisfies the second constraint is $max(3, 2, 3, 3, 1, 1, 4, 1, 5, 4) =$
5

iv)

$$2 * 12 - gcd(12, 20) = 24 - 2 = 22 > 20 \tag{1}$$

Not working for $F = 12$
   All Tasks are working for $F = 10$ because $2 * F$ is always smaller than p_i

$$2 * 10 - gcd(10, 20) = 20 - 10 = 10 \leq 20 \tag{2}$$

v)

$\#of frames = \frac{hyperperiod\ H}{framesize\ F} = \frac{30240}{20} = 1512$

c)

Task i	p_i	e_i	1st exec.	2nd exec.	3rd exec.
0	200	1	0	200	400
1	200	2	1	201	401
2	300	3	3	300	603
3	300	4	6	303	606
4	200	5	10	203	403
5	600	6	15	615	1215

d)

Frame #	frame start	frame end	tasks
0	0	120	0,1,2,3,4,5
1	120	240	0,1,4
2	240	360	2,3
3	360	480	0,1,4
4	480	600	-