Answer on Question 3655, Physics, Mechanics | Kinematics | Dynamics

V_H - horizontal velocity
V_V - vertical velocity

V_0 = 35 m/s, α = 53°, H_0 = 1m, L = 110m
$V_H = V_0 \cos(\alpha)$ = 35 m/s*cos(53°) = 35 m/s*0.6018 = 21.0630 m/s
$V_V(t) = V_0 \sin(\alpha) - gt$ = 35*sin(53°) - 9.8 t = 35*0.7986-9.8t = (27.9510 - 9.8t) m/s
Let`s find H_{max}.
$V_V(T) = 0$
$V_0 \sin(\alpha) = gT \Rightarrow T = (V_0 \sin(\alpha))/g$ = (35 m/s*0.7986)/(9.8 m/s^2) = 2.8521 (s)
$H_{max} = H_0 + TV_V(0) - (gT^2)/2$ = 1 + 2.8521*27.9510 - (9.8*2.8521^2)/2 = 40.8601(m)
Let t_f be the time when ball moved 110m horizontal.
$t_f = L/V_H$ = 110/21.0630 = 5.2224(s)
$H_f = H_{max} - (g(t_f - T)^2)/2$ = 40.8601 - (9.8*(5.2224-2.8521)^2)/2 = 13.3303m
So, the ball will fly 12.3303 meters higher the bench.

Now let write some relations which will help us to define on which bench ball will hit:

$$h = H_{max} - \frac{g\,t^2}{2},$$

$$L_0 + x = V_H\,t,$$

where $L_0 = L - V_H\,T$ is a horizontal distance from the highest point of trajectory to the first bench. According to this definition the point $h = x$ will show us in what bench the ball fell:

$$\frac{g\,t^2}{2} + V_H\,t - (L_0 + H_{max}) = 0 \;\rightarrow\; T_{bench} = 2.65\;s$$

Then total time of flight before the conditions come true is $t_{tot} = T + T_{bench} = 5.5\;s$. And total distance accounted from the starting point is $L_{tot} = V_H\,T_{tot} = 21 \cdot 5.5 = 115.6\;m$. It is clearly shows that the ball will hit sixth bench.