1. We want to use the generalized PHP here. The students are the pigeons and the ages are the holes. We have 65 pigeons and since we have an age range of 17–37, there are 21 holes. Now, $65 > 21 \cdot 3$ so some hole must contain 4 pigeons—that is, there must be $x = 4$ students with the same age.

2. The function $f$ is not injective because $f(1) = f(9)$ and $1 \neq 9$. For every element $y \in Y$, there is an element $x \in X$ such that $y = f(x)$ so $f$ is surjective.