Task: A university invests $600,000 at simple interest, part at 6%, half that amount at 4.5%, and the rest at 3.5%. What is the most the university can invest at 3.5% and be guaranteed at least $24,600 in interest per year?

Solution:

let x amt invested at 4.5%

$2x$ amt invested at 6%

$600000 - 3x$ amt invested at 3.5%

So, we can write the equation:

$$0.045x + 0.06 \cdot 2x + 0.035 \cdot (600000 - 3x) = 24600$$

Let solve it and find x:

$$0.045x + 0.12x + 21000 - 0.105x = 24600$$

$$0.06x = 3600$$

$$x = 60000$$

Hence, we can calculate amt invested at 3.5%:

$$600000 - 3x = 420000$$

Answer: most that the university can invest at 3.5% equals $420000.