

$$\lim_{n \rightarrow \infty} \left| \frac{a_{n+1}}{a_n} \right| = \lim_{n \rightarrow \infty} \left[ \frac{(n+1)!}{100^{n+1}} \cdot \frac{100^n}{n!} \right] = \lim_{n \rightarrow \infty} \frac{n+1}{100} = \infty, \text{ so the series}$$

$\sum_{n=1}^{\infty} \frac{n!}{100^n}$  diverges by the Ratio Test.