(2) (a) We'll have to find k and r so that $x = k \ln 2 + r$ and $|r| < \frac{1}{2} \log 2$ ie. $k = \text{round}\left(\frac{x}{\ln 2}\right)$ and $r = x - \text{round}\left(\frac{x}{\ln 2}\right) \cdot \ln 2$

Then

$$e^x = e^{k \ln 2 + r}$$
$$= e^{k \ln 2} e^r$$
$$= 2^k e^r \quad \text{where} \quad \begin{cases} k = \text{round}\left(\frac{x}{\ln 2}\right) \\ r = x - \text{round}\left(\frac{x}{\ln 2}\right) \ln 2 \end{cases}$$

For own myexp we can set $x = k \ln 2 + r' \ln 2$ where k is same as earlier but $r' = r / \ln 2$ and therefore $e^x = 2^k 2^{r'}$.