Astrophysics Design Problem

You see two stars in the night sky that have the exact same brightness. Choose a star #1 calculate properties so you can design a star #2 so that it has the same brightness.

1 light year (ly) = 9.46×10^{15} m	1 parsec (pc) = 3.26 ly		$\sigma = 5.67 \times 10^{-8}$ W m^{-2} K^{-4}
$d\ (parsec) = \frac{1}{p\ (arcsecond)}$	$L = \sigma A T^4$	$b = \frac{L}{4\pi d^2}$	$\lambda_{max} T = 2.9 \times 10^{-3}$

Star #1 (circle one)

	Sirius B	**Altair**	**61 Cygni A**	**Barnard's Star**
				
Parallax Angle	0.375 arcseconds	0.198 arcseconds	0.294 arcseconds	0.543 arcseconds
Max Wavelength	271 nm	362 nm	690 nm	1035 nm
Stellar Radius	9.94×10^6 m	1.20×10^9 m	3.82×10^8 m	6.29×10^7 m

Temperature	Luminosity	Distance	Brightness

Star #2 (designed by you 😊)

Determine the luminosity of a main sequence star that is farther away from your calculated star but has the exact same brightness. The distance of this star must be based on your birthday. (for example, a birthday of August 3rd would be written 8.03×10^{18} m). Estimate the temperature by locating its position within the main sequence of the H-R Diagram ($L_{sun} = 3.828 \times 10^{26}$ W).

Star Name	
Distance [m]	m m . d d $\times 10^{18}$ m
Luminosity [W]	
Temperature [K]