2) Calculation of energy of a photon:

```
#include <stdio.h>
#include <math.h>
#define plank_constant 6.62607015e-34f
#define speed_of_light 3e8f
int main() {
    float wavelength, energy;
printf("Enter the wavelength of the photon (in meters): ");
scanf("%f", &wavelength);
energy = (planck_constant * speed_of_light) / wavelength
printf("The energy of the photon is: %e Joules\n", energy);
return 0;
}
```

output:

Enter the Wavelength (in meters) $= 7.5 \times 10^{14} s^{-1}$

Enter the Energy of photon $= 4.96 \times 10^{-19} J$

calculation:

$1 \lambda = 10^{-10}$ meters

$v = c/\lambda = \frac{3 \times 10^8 m/s}{4.0 \times 10^{-9} m} = 7.5 \times 10^{14} s^{-1}$

Energy $= h\lambda$

$= 6.626 \times 10^{-14} JS \times 7.5 \times 10^{14} s^{-1}$

$= 4.9695 \times 10^{-19} J$

3.) Calculation of entropy change phase transition.

$$\Delta S = \frac{\Delta H}{T}$$

dH -> Enthalpy (Joul
T -> Temperature (Kelv
ds -> Entropy.

```
#include <stdio.h>
#include <math.h>
int main() {
    float dH, T, ds;
    printf("Enter the enthalpy (Joules): ");
    printf("\n");
    printf("Enter the temperature (Kelvin): ");
    scanf("%f %f", &dH, &T);
    ds = dH / T;
    printf("Entropy = %.2f J/K\n", ds);
    return 0;
}
```

output:

```
Enter the enthalpy (Joules) = 52
Enter the temperature (Kelvin) = 63
Entropy = 0.83 J/K
```