1. Define two Hamilton cycles to be the same if they use the same edges. How many Hamilton cycles are there in $K_{2021}$?

2. The grid graph $G_m$ has $m^2$ vertices arranged into a square grid with each vertex having an edge to each of the vertex to the left, to the right, above and below (if they exist).
   (a) For which $m$ is $G_m$ bipartite?
   (b) For which $m$ does $G_m$ have a Hamilton cycle?
   (c) For which $m$ is $G_m$ planar?

3. Consider the graph obtained from a cycle with $2m$ vertices ($m \geq 3$) by joining all pairs of diametrically opposite vertices (so that every vertex has degree 3).
   (a) What is this graph called for $m = 3$?
   (b) For what $m$ is this graph planar?
   (c) What is the chromatic number for $m = 2021$?

4. For the code with the following generator matrix:
   \[
   \begin{pmatrix}
   1 & 0 & 1 & 0 \\
   0 & 1 & 0 & 1 \\
   0 & 0 & 1 & 1
   \end{pmatrix}
   \]
   (a) How many strings in the code?
   (b) What is the distance?
   (c) Is the code 1-error-detecting?
   (d) Is the code 1-error-correcting?