## Homework3

Due Date: May 25th

You can either email your answer to fernando@tsc.uc3m.es before the afternoon lecture or hand it in during the afternoon lecture.

1. Prove that for if the sequences $A=\left(a_{1}, \ldots, a_{4}\right)$ and $B=\left(b_{1}, \ldots, b_{4}\right)$ are Golay complementary pairs, then the sequences $C=(A, B)$ and $D=(A,-B)$ are also Golay complementary pairs. First, you can check that for $A=(1,1,1,-1)$ and $B=(1,1,-1,1)$, the result holds.

Hint: If $A$ and $B$ are Golay complementary, it means that $a_{1} a_{2}+$ $a_{2} a_{3}+a_{3} a_{4}=-\left(b_{1} b_{2}+b_{2} b_{3}+b_{3} b_{4}\right), a_{1} a_{3}+a_{2} a_{4}=b_{1} b_{3}+b_{2} b_{4}=0$ and $a_{1} a_{4}=-b_{1} b_{4}$.
2. Prove the theorem in Slide 7 at Lecture 6 B.

Hint: Slide 4.

