Foundations of Computer Science (COMP109)

Tutorial X (bring solutions between 04.12.2017 – 08.12.2017)

X.1. Find the 8-bit two's complements for the following integers:

- 25
- 68
- 116

X.2. Using 8-bit representtions, compute

- $25 + (-68)$
- $(-25) + (-68)$

X.3. A woman has six dresses, five pairs of trousers and three shirts. Assuming that the woman can either wear a dress or she can wear trousers with a shirt, how many different outfits does she have? (Explain how you got your answer using the "sum rule" and the "product rule".)

X.4. What are the values of the following expressions?

- $\sum_{i=3}^{6}(i^2 + 6)$
- $\prod_{j=1}^{5}(j/2)$
- $4!$
- $0!$

X.5. A football squad has 18 players; 11 players make a team. How many different teams are possible?

X.6. If a phone number is allowed to start with any digit, including 0, how many 6-digit phone numbers have distinct digits?

X.7. A National Lottery lotto draw selects a set of six different numbers from $1, 2, \ldots, 49$. Each choice is equally likely.

You choose a set of six numbers in advance. If your numbers come up, you win the jackpot. What are the chances that your selection is correct?