1. (a) For each player we can use as utility the amount of money he/she gets:

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1,1,1</td>
<td>1,0,1</td>
<td>1,0,1</td>
</tr>
<tr>
<td>N</td>
<td>0,1,1</td>
<td>0,0,2</td>
<td>0,0,2</td>
</tr>
<tr>
<td>N</td>
<td>0,1,1</td>
<td>0,0,2</td>
<td>0,0,2</td>
</tr>
</tbody>
</table>

CARLA: 2

(b) For Ann
- 2 weakly dominates 3,
- 2 strictly dominates 4
- 3 weakly dominates 4.

(c) Thus 2 is a weakly dominant strategy for Ann. The same is true for the other players (the game is symmetric).

(d) (2,2,2) is thus a dominant-strategy equilibrium.

2. (a1) Note that if x is Al’s final score and y is Brynn’s final score then Al gets an A if and only if $x > \frac{x+y}{2}$ if and only if $2x > x + y$ if and only if $x > y$. Similarly, Brynn gets an A if and only if $y > x$. Now, if $a > b + 10$ (i.e. $a - b > 10$) then $x$ is at least $a$ and $y$ is at most $b + 10$ hence $x > y$ always and Al gets an A no matter what and Brynn gets a B no matter what. Thus cases (ii) and (iii) are trivial. The other cases are solved similarly. The games are as follows.
(i)  \[
\begin{array}{c|cc|c}
   & \text{Brynn} & \checkmark \\
\hline
\text{Al} & \text{no check} & B, B & B, A \\
   & \checkmark & A, B & B, B \\
\end{array}
\]

(ii)  \[
\begin{array}{c|cc|c}
   & \text{Brynn} & \checkmark \\
\hline
\text{Al} & \text{no check} & A, B & A, B \\
   & \checkmark & A, B & A, B \\
\end{array}
\]

(iii)  \[
\begin{array}{c|cc|c}
   & \text{Brynn} & \checkmark \\
\hline
\text{Al} & \text{no check} & B, A & B, A \\
   & \checkmark & B, A & B, A \\
\end{array}
\]

(iv)  \[
\begin{array}{c|cc|c}
   & \text{Brynn} & \checkmark \\
\hline
\text{Al} & \text{no check} & A, B & B, A \\
   & \checkmark & A, B & A, B \\
\end{array}
\]

(v)  \[
\begin{array}{c|cc|c}
   & \text{Brynn} & \checkmark \\
\hline
\text{Al} & \text{no check} & B, A & B, A \\
   & \checkmark & A, B & B, A \\
\end{array}
\]

(a2) In cases (i), (iv) and (v) checking the box is a weakly dominant strategy for each student. In cases (ii) and (iii) the two strategies are equivalent (the outcome is the same no matter what the students do) and thus every strategy is weakly dominant.

(b1) The game is as follows

\[
\begin{array}{c|cc|c}
   & \text{Bob} & \checkmark \\
\hline
\text{Alice} & \text{no check} & B, B, B & B, A, B \\
   & \checkmark & A, B, B & B, B, A \\
\end{array}
\]

\[
\begin{array}{c|cc|c}
   & \text{Bob} & \checkmark \\
\hline
\text{Alice} & \text{no check} & B, B, A & A, B, B \\
   & \checkmark & B, A, B & B, B, B \\
\end{array}
\]

**Carla** chooses: no check

(b2) Nobody has a dominant strategy (no check is best if the other two choose \(\checkmark\), while \(\checkmark\) is best if the other two choose no check).