Exercise 1: VLIWs slot filling

Consider the following basic block:

\[
\begin{align*}
x &= 10; \\
y &= 15; \\
z &= M[x+y]; \\
x &= 2*z; \\
y &= 20; \\
M[z] &= x+y;
\end{align*}
\]

1. Draw the Data Dependency Graph of this program.

2. Rewrite the program so that there are no DD and UD edges.

3. Write down the rewritten program as a sequence of VLIWs with 2 slots.

Exercise 2: Solving Difference Constraints

Solve the following ILP problem:

\[
\begin{align*}
x &\leq 15 \\
y &\leq 20 \\
x + 2 &\leq y \\
z + 3 &\leq x \\
3 &\leq y \\
z + 5 &\leq y \\
10 &\leq z \\
y - 5 &\leq z
\end{align*}
\]