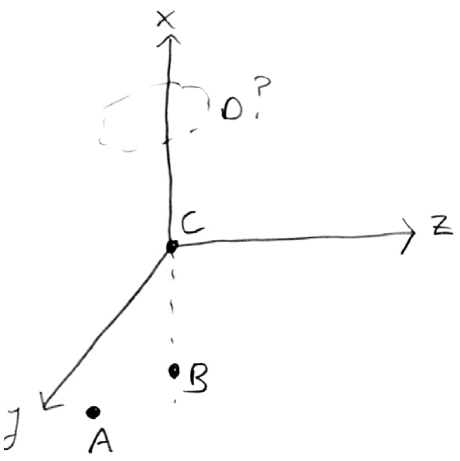


point A is N_i

point B is $C_{\alpha i}$

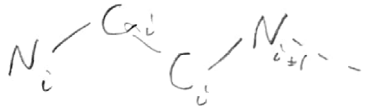
point C is C_i

point D is N_{i+1}

Morgan Nance

Hw #2

Q #1



point C: $(0, 0, 0)$ by definition

C_i

point B: $(-1.5, 0, 0)$ down x-axis by C-C bond length

$C_{\alpha i}$

point A: $(-l\cos\theta, l\sin\theta, 0)$ $\theta = 115°$

N_i $(-1.3\cdot\cos(115°), 1.3\cdot\sin(115°), 0)$

$(0.466, 1.21, 0)$

point D: $(-l\cos\theta, l\sin\theta\cos\phi, l\sin\theta\sin\phi)$ $l = 1.3$, $\theta = 115°$, $\phi = -126.1°$

N_{i+1} $(-1.3\cos(115°), 1.3\cdot\sin(115°)\cdot\cos(-126.1°), 1.3\cdot\sin(115°)\cdot\sin(-126.1°))$

$N_{i+1} = D = (0.634, -0.800, -1.098) \times M$

but couldn't figure out M rotation matrix

Q1.b. I would translate the xyz plane to the next carbonyl carbon and recalculate the xyz coordinates for the next N atom. This would repeat using the previous residue's (ℓ, θ, χ) coordinates to answer the next.

Q 1.d. Without the M rotation matrix, the N_{i+1} is in the wrong spot. I also had a problem with the C and C_α atoms being in the wrong spot.

```
ATOM      1  N   ALA A   1       0.466   1.210   0.000  1.00 39.26
N
ATOM      2  CA  ALA A   1      -1.500   0.000   0.000  1.00 37.65
C
ATOM      3  C   ALA A   1       0.000   0.000   0.000  1.00 40.25
C
ATOM      4  N   ALA A   2       0.634  -0.800  -1.098  1.00 41.55
N
END
```