### **Coordinates**

CC = (42.3126653, -71.0366086)

Uhall = (42.3131102, -71.0347790)

Wheatly = (42.3121882, -71.0382675)

McCormack = (42.3126490, -71.0394695)

ISC = (42.3141399, -71.0411653)

Res Hall = (42.3165175, -71.0396415)

Jfk station = (42.3207083, -71.0522607)

Using the estimated time to reach the destination at a normal walking speed of 3 miles per hour

It doesn't consider paths just the quickest way to get there.

### **Oxygen Level**

* We inhale and exhale proximity 0.036 to 0.075 psi or 0.5 liters of air each breath
* Average human takes 12-20 breaths per minute.
* Air volume (in liters) = respiratory rate (in breaths per minute) x tidal volume (in liters per breath) x time (in minutes)
* The amount of oxygen used in psi (pounds per square inch) over time depends on the flow rate of oxygen and the duration of use. To calculate the amount of oxygen used in psi over time, you would need to know the flow rate of oxygen in liters per minute (L/min) and the duration of use in minutes.
* Once you have this information, you can use the following equation to estimate the amount of oxygen used in psi:
* V = (F \* t) / R
* Where:
* V = Volume of oxygen used (in cubic feet, CF)
* F = Flow rate of oxygen (in liters per minute, L/min)
* t = Duration of use (in minutes)
* R = Constant conversion factor of 0.037, which converts the volume of oxygen from cubic feet to pounds at standard temperature and pressure.
* To convert the volume of oxygen used in cubic feet to psi, you would then divide the result by the cylinder capacity in cubic feet:
* P = V / C
* Where:
* P = Pressure in psi
* V = Volume of oxygen used (in cubic feet, CF)
* C = Cylinder capacity (in cubic feet, CF)
* O = (P1 - P2) \* V / (T \* 60)
* Where:
* O = Oxygen level used (in psi)
* P1 = Initial oxygen pressure (in psi)
* P2 = Final oxygen pressure (in psi)
* V = Volume of the oxygen cylinder (in cubic feet)
* T = Duration of use (in minutes)

### **Water Level**

* about 8 oz. every 15 minutes
* Drink 7 to 10 ounces of fluid every 10-20 minutes during exercise
* Water consumption (in liters) = Distance (in kilometers) x Intensity Factor + Weather Adjustment + Additional Needs

### **Battery Level**

* Battery level = Initial battery level - (Energy consumption rate per mile / Capacity) \* Distance traveled
* Battery level = Initial battery level - (Discharge Current / Capacity) \* time

### **Distance**

= 6371e3 # metres

lat1 = # replace with your value

lat2 = # replace with your value

lon1 = # replace with your value

lon2 = # replace with your value

phi1 = lat1 \* math.pi/180 # φ, λ in radians

phi2 = lat2 \* math.pi/180

delta\_phi = (lat2-lat1) \* math.pi/180

delta\_lambda = (lon2-lon1) \* math.pi/180

a = math.sin(delta\_phi/2) \* math.sin(delta\_phi/2) + \

math.cos(phi1) \* math.cos(phi2) \* \

math.sin(delta\_lambda/2) \* math.sin(delta\_lambda/2)

c = 2 \* math.atan2(math.sqrt(a), math.sqrt(1-a))

d = R \* c # in metres