

```
1: #!/usr/bin/python3
2: from pylab import *
3: from math import *
4: from numpy import *
5:
6: def p2():
7:     """2.9: The Madelung Constant"""
8:     print("2.9 [The madelung constant]:")
9:     limit = int(input("L: "))
10:
11:     def v(i, j, k):
12:         """Calculates the \"Potential\" created by an atom"""
13:         return (-1 if
14:                 (i + j + k) % 2 == 1 else 1) * 1 / sqrt(i**2 + j**2 + k**2)
15:
16:     madelung = 0
17:     for i in range(-limit, limit + 1):
18:         for j in range(-limit, limit + 1):
19:             for k in range(-limit, limit + 1):
20:                 if i == j == k == 0:
21:                     continue
22:                 madelung += v(i, j, k)
23:     print(madelung)
24:
25: if __name__ == "__main__":
26:     p2()
```