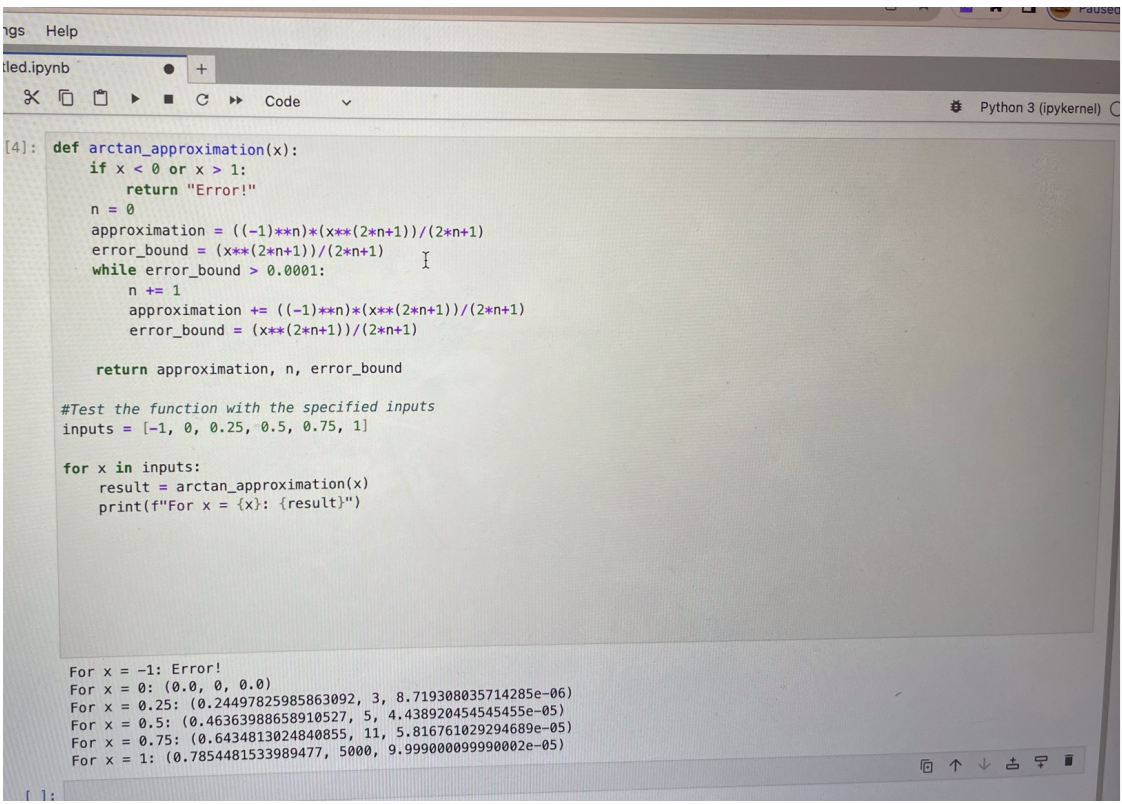
ngs Help
tled.ipynb
Code
Python 3 (ipykernel)
[4]:
def arctan_approximation(x):
if x < 0 or x > 1:
return "Error!"
n = 0
approximation = ((-1)**n)*(x**(2*n+1))/(2*n+1)
error_bound = (x**(2*n+1))/(2*n+1)
while error_bound > 0.0001:
n += 1
approximation += ((-1)**n)*(x**(2*n+1))/(2*n+1)
error_bound = (x**(2*n+1))/(2*n+1)
return approximation, n, error_bound
#Test the function with the specified inputs
inputs = [-1, 0, 0.25, 0.5, 0.75, 1]
for x in inputs:
result = arctan_approximation(x)
print(f"For x = {x}: {result}")
For x = -1: Error!
For x = 0: (0.0, 0, 0.0)
For x = 0.25: (0.24497825985863092, 3, 8.719308035714285e-06)
For x = 0.5: (0.46363988658910527, 5, 4.438920454545455e-05)
For x = 0.75: (0.6434813024840855, 11, 5.816761029294689e-05)
For x = 1: (0.7854481533989477, 5000, 9.999000999990002e-05)