Part 3:

Note : I was having some trouble in implementing parts of my code required for this activity, thus, data below may be inaccurate.

k = 22

n = 500

Time(A) = 0.00513
Time(B) = 0.00524

n = 1000

Time(A) = 0.00249
Time(B) = 0.00255

k = 24

n = 500

Time(A) = 0.00560
Time(B) = 0.00547

n = 1000

Time(A) = 0.00280
Time(B) = 0.00264

k = 28

n = 5000

Time(A) = 0.0145
Time(B) = 0.0150

n = 10000

Time(A) = 0.030

Time(B) = 0.031

k = 30

n = 5000

Time(A) = 0.017
Time(B) = 0.015

n = 10000

Time(A) = 0.033
Time(B) = 0.030

Based on the data collected above, the smallest value of k for which algorithm B becomes faster than algorithm A, let's call this F(n) is as follows:

Approximate values for F(n), where n = 500, 1000, 5000, 10000 :

F(500) = 24
F(1000) = 24
F(5000) = 30
F(10000) = 30