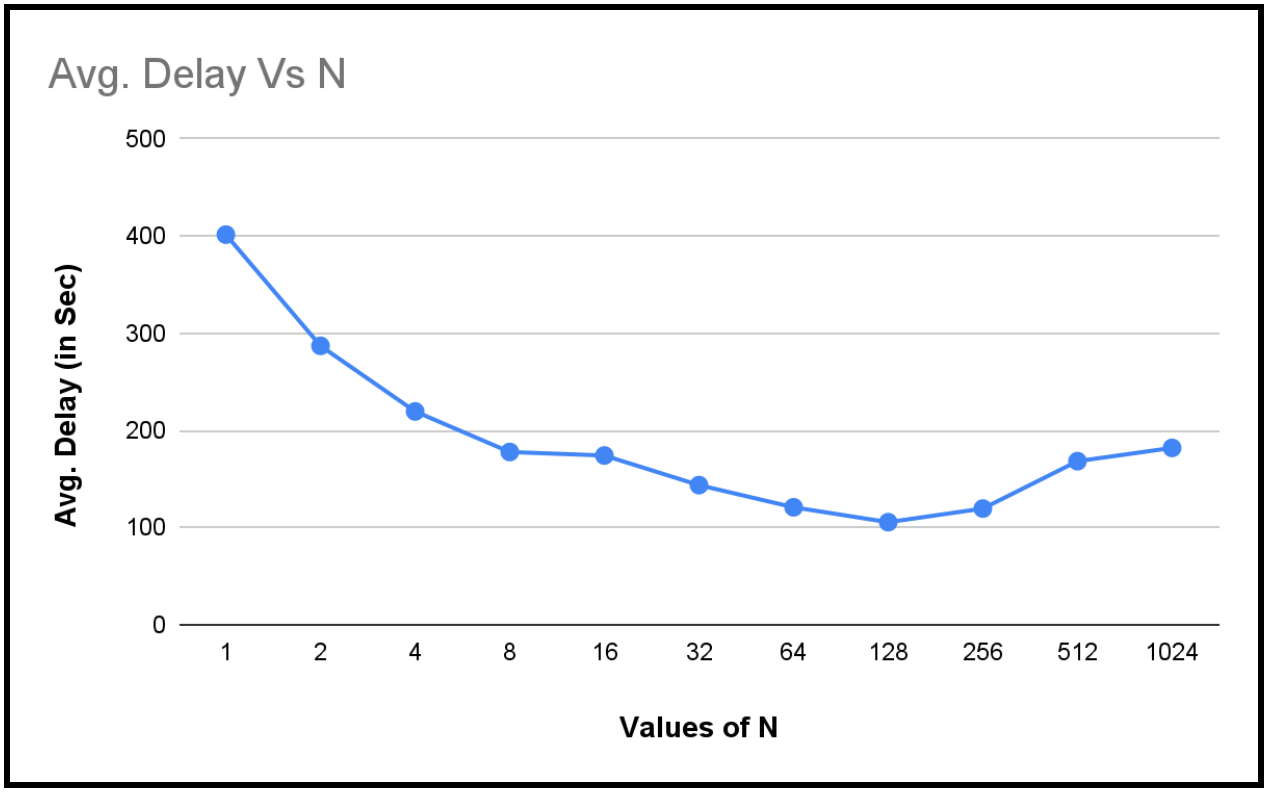
IP Project 2: Go-Back-N

Group Member 1: Banpreet SIngh Chhabra 200369896
Group Member 2: Harikrishna Selvaraj 200366498

TASK 1:

N	Delay 1	Delay 2	Delay 3	Delay 4	Delay 5	Avg. Delay
1	406.66650581359863	416.6878342628479	378.55387687683105	419.7526550292969	385.6154160499573	401.4552576
2	288.2062039375305	326.3507101535797	291.259670972824	262.0717809200287	267.1429350376129	287.0062602
4	196.7811770439148	247.03836274147034	228.99235820770264	225.92878699302673	198.8052339553833	219.5091838
8	161.74326992034912	173.74800491333008	194.81900191307068	175.7638509273529	182.829097032547	177.7806449
16	158.74738788604736	179.7823610305786	179.8238570690155	173.7650318145752	178.77823114395142	174.1793738
32	144.70635080337524	156.7866599559784	132.64714407920837	142.67499113082886	141.68025374412537	143.6990799
64	130.72807598114014	118.6946132183075	119.66422820091248	111.66383481025696	123.69949126243591	120.8900487
128	111.8090858	95.67927289	105.772887	115.8798196	98.70512891	105.5692389
256	96.97974873	125.3218021	137.3811138	112.120095	126.1143179	119.5834155
512	165.2972429	169.2467768	172.6299779	161.941576	172.5105002	168.3252148
1024	180.4119451	179.635242	177.4701221	185.9326731	186.5540562	182.0008077



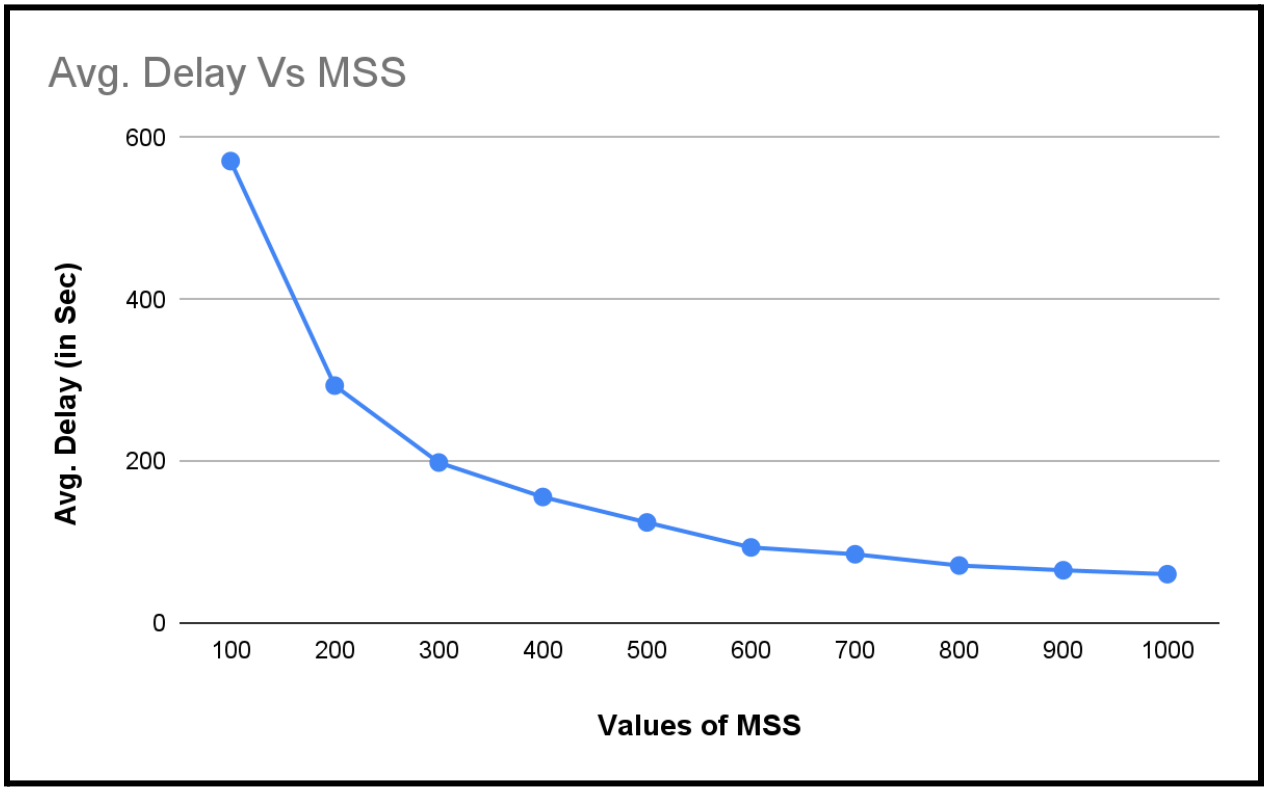
Explanation:

For smaller values of window size (N), more time is taken for sending and receiving acknowledgment and hence it leads to more Average delay time. Now for greater values of N, as the window size is big so more and big retransmissions are required and hence more time is taken for retransmitting the data because of errors and big window size. Hence it also leads to more average delay. Therefore there is 1 point (in our case, N=128), where there is an optimal solution and the least Average Delay in sending a 1MB file.

TASK 2:

MSS	Delay 1	Delay 2	Delay 3	Delay 4	Delay 5	Avg. Delay
100	561.26914 81113434	600.87697 52979279	593.66245 6035614	555.35637 02106476	543.96655 39264679	571.0263007
200	311.03472 5189209	319.04375 91075897	296.83942 103385925	262.07178 09200287	278.45016 12186432	293.4879695

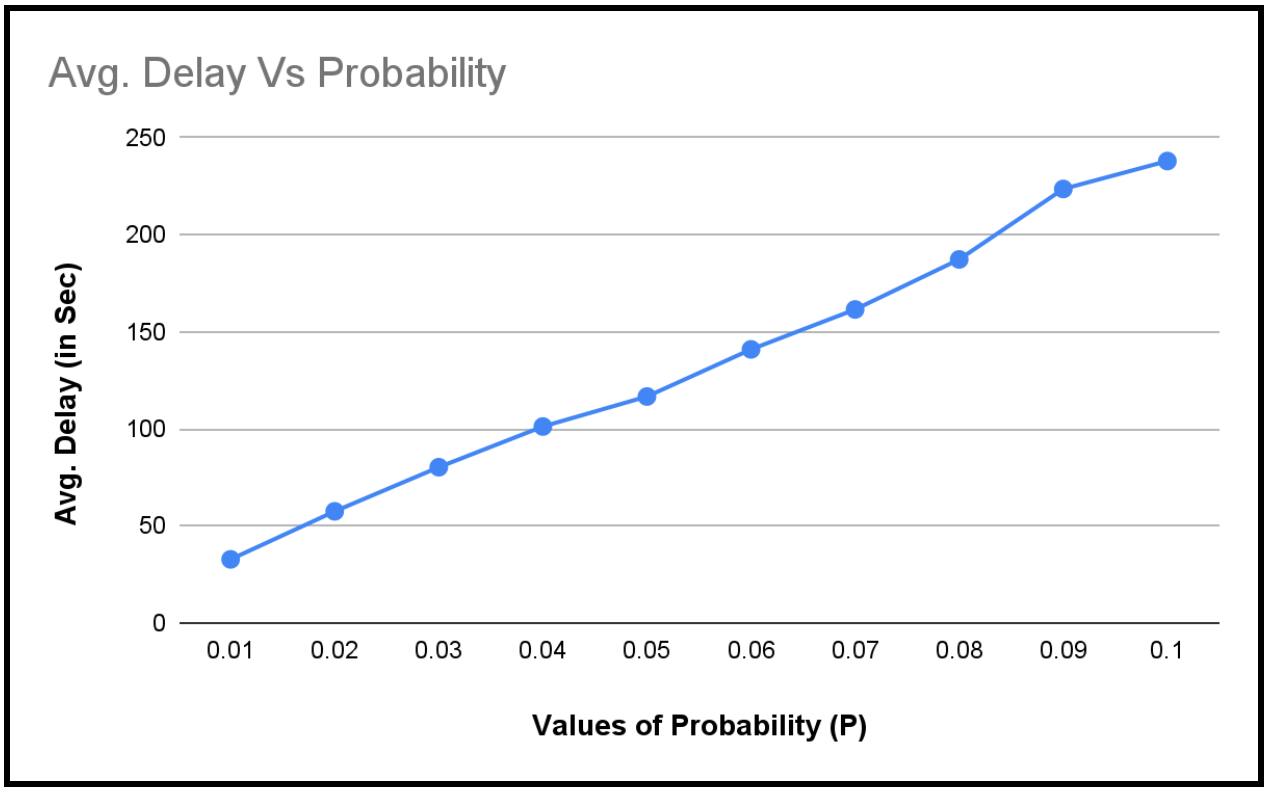
300	183.62927722930908	198.7698938846588	198.70159482955933	192.73680591583252	217.9931058883667	198.3661355
400	163.33531069755554	154.3372781276703	157.40784192085266	152.37656784057617	151.40391206741333	155.7721821
500	118.98492288589478	110.0473279953003	129.14681196212769	133.1680989265442	130.2135579586029	124.3121439
600	100.89122796058655	87.72794604301453	104.89742517471313	88.81167817115784	84.76125693321228	93.41790686
700	78.74970769882202	97.84962892532349	84.75743579864502	71.63906979560852	91.77631402015686	84.95443125
800	69.64680910110474	76.70718502998352	51.41556191444397	69.62648868560791	87.79946494102478	71.03910193
900	62.52611708641052	62.552488803863525	72.674076795578	58.555493116378784	69.64441180229187	65.19051752
1000	58.49224805831909	61.55053210258484	65.58887386322021	52.498563051223755	63.587895154953	60.34362245



Explanation:
Greater values of MSS (Max Segment Size) signifies more data can be sent in a single segment. Hence, for greater MSS value, less number of overall segments have to be transmitted and hence it results in less Average delay as MSS value increases.

TASK 3:

P	Delay 1	Delay 2	Delay 3	Delay 4	Delay 5	Avg. Delay
0.01	25.157441 85447693	27.131440 87791443	40.202253 103256226	32.154324 769973755	39.221270 0843811	32.77334614
0.02	68.392971 03881836	50.281494 140625	58.341569 900512695	65.338254 69017029	45.228152 99034119	57.51648855
0.03	76.393011 09313965	92.534190 89317322	81.494555 9501648	75.383888 00621033	75.404424 90577698	80.24201417
0.04	93.520192 14630127	97.704689 0258789	97.694774 15084839	104.54847 78881073	112.58753 108978271	101.2111329
0.05	110.62614 798545837	119.75013 089179993	129.77956 986427307	94.915295 83930969	128.24553 394317627	116.6633357
0.06	147.47376 990318298	138.29244 184494019	142.39522 409439087	133.26327 204704285	143.28190 517425537	140.9413226
0.07	159.56608 295440674	173.65450 382232666	159.46783 018112183	165.50005 769729614	149.34931 111335754	161.5075572
0.08	189.64034 271240234	163.57785 79711914	179.58101 511001587	197.74832 51094818	205.85756 492614746	187.2810212
0.09	203.88549 56626892	235.16861 414909363	229.67659 378051758	229.66816 806793213	219.49685 502052307	223.5791453
0.10	233.42062 902450562	239.42682 38544464	237.42429 089546204	247.56187 796592712	231.99273 39553833	237.9652711



Explanation:

Probability value signifies the probability of package being dropped. So, as the probability value increases, more and more packets will be dropped and hence more retransmission will be required. Hence this leads to more Average delta times in sending packets with a higher probability value.