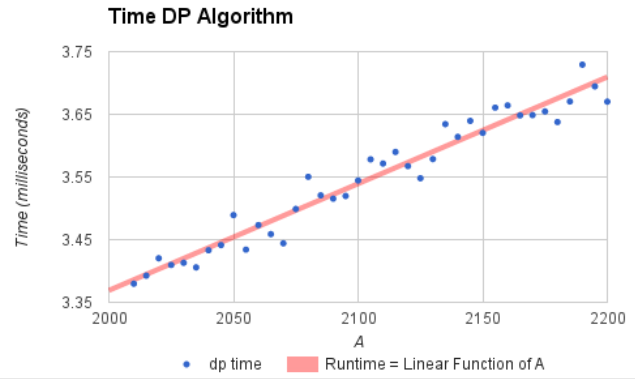
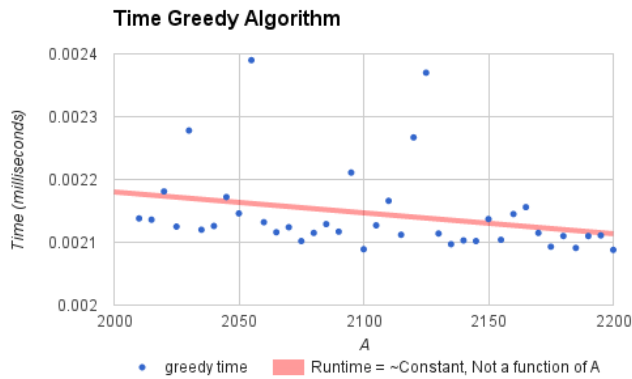
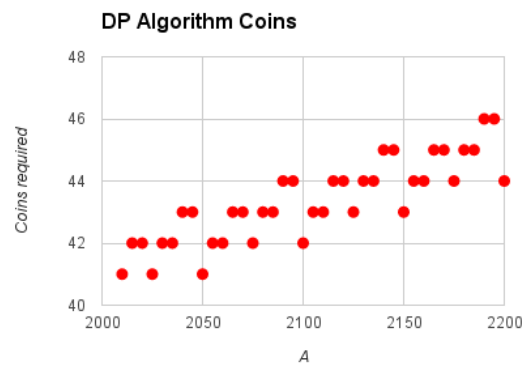
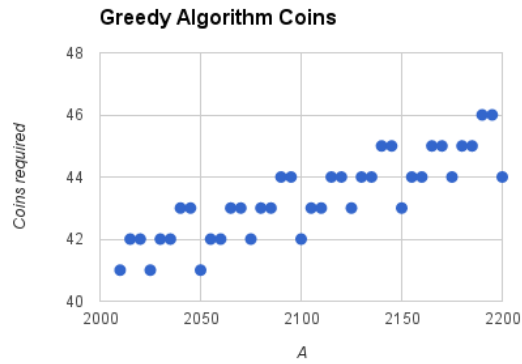


# problem 4

amount	greedy coins	dp coins	greedy time	dp time
2010	41	41	0.002138	3.37967
2015	42	42	0.002136	3.39256
2020	42	42	0.002181	3.42028
2025	41	41	0.002125	3.4096
2030	42	42	0.002278	3.41309
2035	42	42	0.00212	3.40577
2040	43	43	0.002126	3.43308
2045	43	43	0.002172	3.4413
2050	41	41	0.002146	3.4892
2055	42	42	0.00239	3.43409
2060	42	42	0.002132	3.47326
2065	43	43	0.002116	3.45883
2070	43	43	0.002124	3.44417
2075	42	42	0.002102	3.49894
2080	43	43	0.002115	3.55028
2085	43	43	0.002129	3.5207
2090	44	44	0.002117	3.51547
2095	44	44	0.002211	3.5197
2100	42	42	0.002089	3.54442
2105	43	43	0.002127	3.57812
2110	43	43	0.002166	3.57149
2115	44	44	0.002112	3.59001
2120	44	44	0.002267	3.56738
2125	43	43	0.00237	3.54797
2130	44	44	0.002114	3.5786
2135	44	44	0.002097	3.63435
2140	45	45	0.002103	3.61402
2145	45	45	0.002102	3.63954
2150	43	43	0.002137	3.62034
2155	44	44	0.002104	3.66065
2160	44	44	0.002145	3.66425
2165	45	45	0.002156	3.64831
2170	45	45	0.002115	3.64878
2175	44	44	0.002093	3.6546
2180	45	45	0.00211	3.6377
2185	45	45	0.002091	3.67051
2190	46	46	0.00211	3.72922
2195	46	46	0.002111	3.6946
2200	44	44	0.002088	3.67028



## problem5

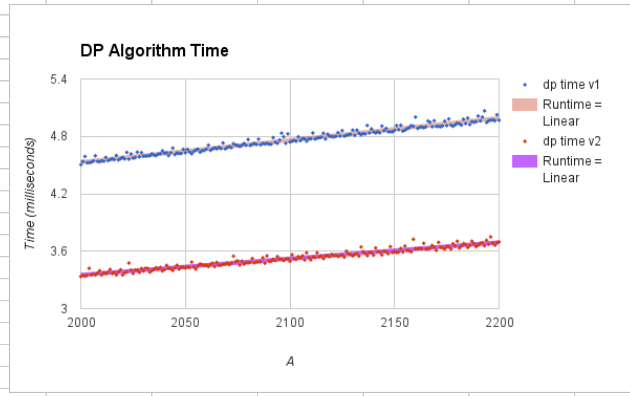
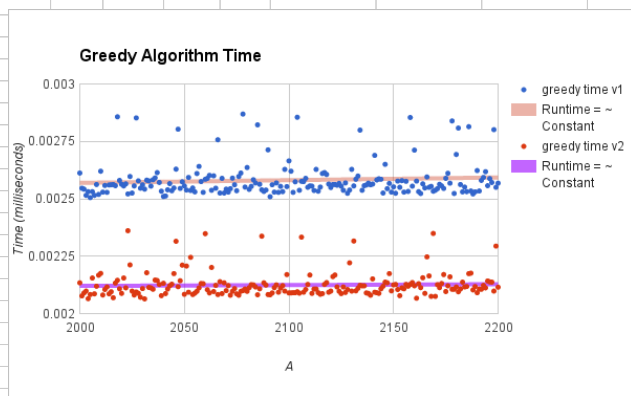
amount	greedy coins v1	dp coins v1	greedy coins v2	dp coins v2	greedy time v1	dp time v1	greedy time v2	dp time v2										
2000	36	36	15	15	0.002612	4.5041	0.002134	3.33621	<div><h3>v1 set Coins Needed</h3></div>									
2001	37	37	16	16	0.002546	4.53779	0.002077	3.34719										
2002	37	37	17	17	0.002542	4.58974	0.00209	3.33804										
2003	38	38	18	18	0.002515	4.52578	0.002098	3.34602										
2004	34	34	19	19	0.002531	4.52378	0.002065	3.42077										
2005	35	35	20	17	0.002505	4.52924	0.002083	3.35307										
2006	35	35	16	16	0.002531	4.54393	0.002155	3.36062										
2007	36	36	17	17	0.002515	4.59742	0.002086	3.35109										
2008	36	36	18	18	0.002562	4.53805	0.002119	3.37131										
2009	37	37	19	19	0.002519	4.53429	0.002167	3.39628										
2010	35	35	20	20	0.00262	4.54345	0.002175	3.35019										
2011	36	36	21	18	0.002529	4.53946	0.002081	3.37578										
2012	36	36	17	17	0.002558	4.58039	0.002105	3.36554										
2013	37	37	16	16	0.002528	4.54679	0.002116	3.38168										
2014	37	37	17	17	0.00256	4.55601	0.002086	3.41001										
2015	38	38	18	18	0.002561	4.56733	0.002095	3.36592										
2016	35	34	19	19	0.002562	4.55655	0.002069	3.37806										
2017	36	35	20	19	0.002557	4.59917	0.002133	3.35195										
2018	36	35	21	18	0.002857	4.5528	0.002145	3.38384										
2019	37	36	17	17	0.00258	4.5664	0.002108	3.40682										
2020	37	36	18	18	0.002563	4.58181	0.002088	3.35147										
2021	38	37	19	19	0.002556	4.56365	0.002155	3.37303										
2022	36	35	20	18	0.002565	4.63397	0.002112	3.38221										
2023	37	36	21	19	0.002521	4.5609	0.002361	3.4769										
2024	37	36	15	15	0.002597	4.61627	0.002212	3.40244										
2025	38	37	16	16	0.002525	4.57187	0.002098	3.36811										
2026	38	37	17	17	0.002556	4.57731	0.002081	3.40174										
2027	39	38	18	18	0.002852	4.63461	0.002094	3.40157										
2028	34	34	19	19	0.002578	4.58557	0.002088	3.37895										
2029	35	35	20	20	0.002546	4.62954	0.002071	3.41891										
2030	35	35	16	16	0.002561	4.59335	0.002109	3.39321										
2031	36	36	17	17	0.002542	4.59465	0.002064	3.42299										
2032	36	36	18	18	0.002581	4.59573	0.002178	3.41925										
2033	37	37	19	19	0.002578	4.59779	0.002114	3.3814										
2034	35	35	20	20	0.002555	4.61773	0.002112	3.39676										
2035	36	36	21	19	0.002583	4.60599	0.002106	3.41067										
2036	36	36	17	17	0.002591	4.59812	0.002146	3.4272										
2037	37	37	16	16	0.002614	4.61561	0.002144	3.41287										
2038	37	37	17	17	0.002571	4.61743	0.002127	3.42957										
2039	38	38	18	18	0.002533	4.64917	0.002078	3.39273										
2040	34	34	19	19	0.00251	4.62383	0.002132	3.40762										
2041	35	35	20	20	0.002512	4.62823	0.002087	3.45159										
2042	35	35	21	18	0.002539	4.5988	0.002107	3.42339										
2043	36	36	17	17	0.002566	4.62957	0.002121	3.41854										
2044	36	36	18	18	0.002535	4.67738	0.002128	3.39847										
2045	37	37	19	19	0.002547	4.61033	0.002174	3.42951										
2046	35	35	20	20	0.002629	4.62725	0.002315	3.45374										
2047	36	36	21	21	0.002803	4.62132	0.002117	3.41125										
2048	36	36	22	19	0.002545	4.62097	0.002143	3.43473										
2049	37	37	18	18	0.002574	4.66469	0.002211	3.43088										
2050	37	37	17	17	0.002556	4.62793	0.002084	3.4222										
2051	38	38	18	18	0.002538	4.66544	0.002207	3.43582										
2052	35	35	19	19	0.002593	4.63771	0.002093	3.42998										
2053	36	36	20	20	0.002536	4.61741	0.002245	3.48655										
2054	36	36	21	20	0.002547	4.64218	0.002083	3.43323										
2055	37	37	22	19	0.00253	4.65938	0.002089	3.41302										
2056	37	37	18	18	0.00261	4.6656	0.002097	3.44581										
2057	38	38	19	19	0.002641	4.63485	0.002112	3.46618										
2058	36	36	20	20	0.002575	4.65057	0.002131	3.45916										
2059	37	37	21	19	0.002528	4.65201	0.00213	3.45397										
2060	37	37	22	20	0.002585	4.66782	0.002348	3.45367										
2061	38	38	16	16	0.002589	4.70884	0.002104	3.43842										
2062	38	38	17	17	0.002602	4.65386	0.00209	3.46123										
2063	39	39	18	18	0.002537	4.66852	0.002201	3.47443										
2064	35	35	19	19	0.0026	4.68123	0.002096	3.43882										
2065	36	36	20	20	0.002546	4.67021	0.002123	3.48161										
2066	36	36	21	21	0.002757	4.68669	0.002083	3.45249										
2067	37	37	17	17	0.002525	4.67245	0.002139	3.45116										
2068	37	37	18	18	0.002589	4.73114	0.002087	3.46136										
2069	38	38	19	19	0.002525	4.66983	0.002134	3.4644										
2070	36	36	20	20	0.002542	4.68232	0.0021	3.4769										
2071	37	37	21	21	0.002529	4.69328	0.002122	3.46135										
2072	37	37	22	20	0.002544	4.68235	0.00208	3.47545										
2073	38	38	18	18	0.00259	4.72279	0.002097	3.54734										
2074	38	38	17	17	0.002561	4.70824	0.002109	3.49037										

# problem5

amount	greedy coins v1	dp coins v1	greedy coins v2	dp coins v2	greedy time v1	dp time v1	greedy time v2	dp time v2								
2075	39	39	18	18	0.002535	4.70784	0.002086	3.49976								
2076	36	35	19	19	0.002597	4.69409	0.00208	3.45523								
2077	37	36	20	20	0.002612	4.70705	0.002097	3.49473								
2078	37	36	21	21	0.002869	4.72525	0.0021	3.46581								
2079	38	37	22	19	0.002551	4.70731	0.002107	3.47994								
2080	38	37	18	18	0.002636	4.7669	0.002097	3.4768								
2081	39	38	19	19	0.002541	4.70445	0.002113	3.48472								
2082	37	36	20	20	0.002554	4.7164	0.002126	3.52339								
2083	38	37	21	21	0.002583	4.72583	0.002125	3.47799								
2084	38	37	22	22	0.002569	4.71551	0.002116	3.48849								
2085	39	38	23	20	0.002822	4.77136	0.002082	3.48815								
2086	39	38	19	19	0.002563	4.71105	0.002108	3.48892								
2087	40	39	18	18	0.002539	4.72644	0.002337	3.53081								
2088	35	35	19	19	0.002532	4.72044	0.002134	3.4733								
2089	36	36	20	20	0.002538	4.72629	0.002124	3.55101								
2090	36	36	21	21	0.002713	4.71892	0.002083	3.49592								
2091	37	37	22	21	0.002509	4.71741	0.002082	3.49439								
2092	37	37	23	20	0.002561	4.78795	0.00209	3.51711								
2093	38	38	19	19	0.002529	4.73864	0.002113	3.50127								
2094	36	36	20	20	0.002569	4.72838	0.002125	3.54471								
2095	37	37	21	21	0.002528	4.7618	0.002093	3.51867								
2096	37	37	22	20	0.002554	4.83387	0.002111	3.51535								
2097	38	38	23	21	0.002531	4.79621	0.002122	3.5033								
2098	38	38	17	17	0.002628	4.72647	0.002098	3.51575								
2099	39	39	18	18	0.002553	4.82635	0.00217	3.52242								
2100	35	35	14	14	0.002665	4.74157	0.00209	3.49477								
2101	36	36	15	15	0.00262	4.74939	0.00209	3.56221								
2102	36	36	16	16	0.002528	4.75702	0.002091	3.51967								
2103	37	37	17	17	0.002574	4.75026	0.002091	3.51254								
2104	37	37	18	18	0.002855	4.79635	0.002095	3.54462								
2105	38	38	19	19	0.002537	4.75578	0.002089	3.52692								
2106	36	36	15	15	0.002576	4.77613	0.002333	3.55155								
2107	37	37	16	16	0.002575	4.77325	0.002093	3.50755								
2108	37	37	17	17	0.002589	4.74936	0.002105	3.5834								
2109	38	38	18	18	0.00255	4.77426	0.002127	3.53345								
2110	38	38	19	19	0.002556	4.7742	0.002168	3.50947								
2111	39	39	20	18	0.002555	4.83524	0.002088	3.53878								
2112	36	36	16	16	0.002536	4.77109	0.002107	3.53355								
2113	37	37	15	15	0.002628	4.78157	0.002107	3.58334								
2114	37	37	16	16	0.002533	4.78446	0.002091	3.53939								
2115	38	38	17	17	0.002551	4.79105	0.002084	3.55088								
2116	38	38	18	18	0.00261	4.83284	0.002087	3.52141								
2117	39	39	19	19	0.002614	4.77274	0.002127	3.55323								
2118	37	37	20	17	0.002606	4.82349	0.002135	3.55369								
2119	38	38	16	16	0.002564	4.802	0.002093	3.54262								
2120	38	38	17	17	0.002549	4.79645	0.002098	3.56665								
2121	39	39	18	18	0.002562	4.79545	0.002161	3.55235								
2122	39	39	19	19	0.002562	4.80067	0.002168	3.55649								
2123	40	40	20	20	0.002559	4.83809	0.002116	3.54398								
2124	36	36	21	18	0.002567	4.80339	0.002097	3.55401								
2125	37	37	17	17	0.002555	4.86062	0.002087	3.55955								
2126	37	37	16	16	0.002537	4.8019	0.002116	3.53592								
2127	38	38	17	17	0.002569	4.81001	0.002092	3.59929								
2128	38	38	18	18	0.002524	4.81572	0.002105	3.57233								
2129	39	39	19	19	0.002538	4.82169	0.002221	3.56527								
2130	37	37	20	19	0.002628	4.86633	0.002098	3.5516								
2131	38	38	21	18	0.002556	4.81173	0.002316	3.563								
2132	38	38	17	17	0.002585	4.86552	0.002099	3.57368								
2133	39	39	18	18	0.002599	4.83364	0.00211	3.54851								
2134	39	39	19	19	0.002799	4.81678	0.002123	3.64396								
2135	40	40	20	18	0.002537	4.83095	0.002121	3.59592								
2136	37	36	21	19	0.002557	4.82481	0.002121	3.57669								
2137	38	37	15	15	0.00256	4.91306	0.00209	3.55381								
2138	38	37	16	16	0.002568	4.83508	0.002088	3.58633								
2139	39	38	17	17	0.002561	4.87766	0.00208	3.58528								
2140	39	38	18	18	0.002564	4.84615	0.002151	3.55833								
2141	40	39	19	19	0.002689	4.8357	0.002093	3.63364								
2142	38	37	20	20	0.002582	4.84738	0.002091	3.59513								
2143	39	38	16	16	0.002587	4.83779	0.002088	3.5871								
2144	39	38	17	17	0.002585	4.90767	0.002108	3.56085								
2145	40	39	18	18	0.002525	4.85964	0.002119	3.60076								
2146	40	39	19	19	0.00265	4.88308	0.002137	3.59351								
2147	41	40	20	20	0.002544	4.84902	0.002134	3.57413								
2148	36	36	21	19	0.002567	4.84913	0.002174	3.64874								
2149	37	37	17	17	0.002529	4.8479	0.002099	3.58399								

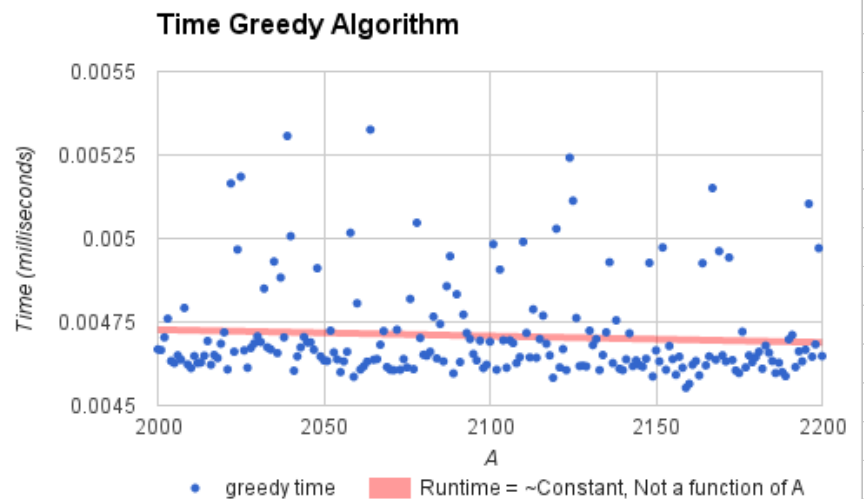
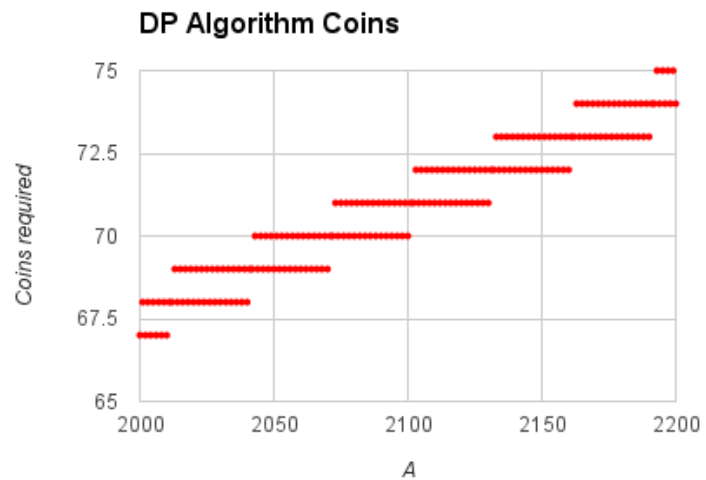
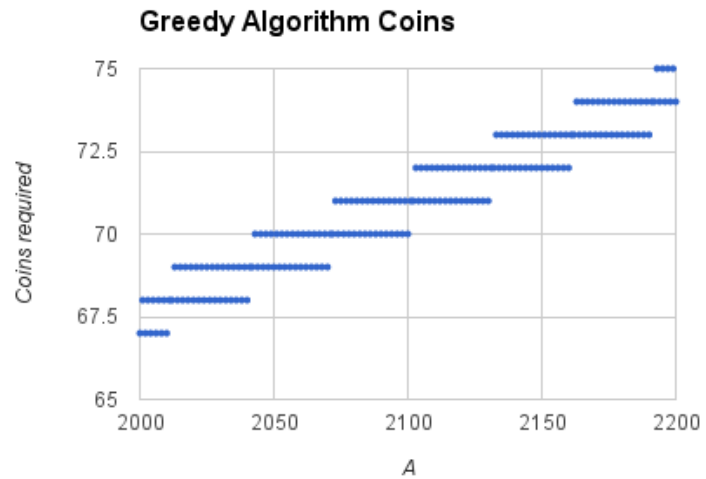
# problem5

amount	greedy coins v1	dp coins v1	greedy coins v2	dp coins v2	greedy time v1	dp time v1	greedy time v2	dp time v2											
2150	37	37	16	16	0.002552	4.86186	0.002125	3.59447											
2151	38	38	17	17	0.002524	4.91263	0.002127	3.58541											
2152	38	38	18	18	0.002577	4.86896	0.002105	3.59116											
2153	39	39	19	19	0.00255	4.91762	0.002078	3.62992											
2154	37	37	20	20	0.002579	4.85493	0.002112	3.5908											
2155	38	38	21	18	0.002529	4.86414	0.002108	3.65317											
2156	38	38	17	17	0.002576	4.8795	0.002127	3.60604											
2157	39	39	18	18	0.002532	4.89012	0.002119	3.6054											
2158	39	39	19	19	0.002854	4.91268	0.002127	3.59254											
2159	40	40	20	20	0.002555	4.90522	0.002135	3.72378											
2160	36	36	21	21	0.002712	5.00189	0.002121	3.62728											
2161	37	37	22	19	0.002577	4.88349	0.002067	3.62603											
2162	37	37	18	18	0.002531	4.89382	0.00213	3.63153											
2163	38	38	17	17	0.002523	4.89925	0.002113	3.62482											
2164	38	38	18	18	0.002565	4.88991	0.002156	3.68245											
2165	39	39	19	19	0.002547	4.89926	0.002088	3.62015											
2166	37	37	20	20	0.002595	4.96024	0.002247	3.62371											
2167	38	38	21	20	0.00255	4.94747	0.002164	3.63005											
2168	38	38	22	19	0.002554	4.89977	0.002075	3.66086											
2169	39	39	18	18	0.002533	4.9647	0.002349	3.64062											
2170	39	39	19	19	0.002537	4.90342	0.002075	3.6084											
2171	40	40	20	20	0.002544	4.9044	0.002126	3.69187											
2172	37	37	21	19	0.002563	4.90246	0.002113	3.63994											
2173	38	38	22	20	0.002556	4.91048	0.002131	3.63675											
2174	38	38	16	16	0.002545	4.95906	0.00217	3.62124											
2175	39	39	17	17	0.002589	4.91153	0.002096	3.65004											
2176	39	39	18	18	0.002611	4.98222	0.002121	3.64554											
2177	40	40	19	19	0.002568	4.91872	0.00216	3.62267											
2178	38	38	20	20	0.002839	4.90543	0.002106	3.67795											
2179	39	39	21	21	0.002523	4.92037	0.002106	3.65344											
2180	39	39	17	17	0.002693	4.93809	0.002116	3.70333											
2181	40	40	18	18	0.002808	4.93194	0.002095	3.63318											
2182	40	40	19	19	0.002562	4.9173	0.002107	3.65414											
2183	41	41	20	20	0.00253	4.97942	0.002137	3.67897											
2184	37	37	21	21	0.002551	4.93482	0.002116	3.66983											
2185	38	38	22	20	0.002531	4.99242	0.002118	3.63789											
2186	38	38	18	18	0.002814	4.92257	0.002174	3.66002											
2187	39	39	17	17	0.002534	4.95327	0.002176	3.70431											
2188	39	39	18	18	0.002521	4.94779	0.002103	3.67814											
2189	40	40	19	19	0.00253	4.95383	0.002118	3.6478											
2190	38	38	20	20	0.002623	5.01309	0.002091	3.6617											
2191	39	39	21	21	0.002534	4.96183	0.002107	3.68117											
2192	39	39	22	19	0.00258	5.00182	0.002106	3.68837											
2193	40	40	18	18	0.002593	5.06586	0.002123	3.65662											
2194	40	40	19	19	0.002618	4.94497	0.002112	3.71317											
2195	41	41	20	20	0.002557	4.96347	0.002142	3.67278											
2196	38	37	21	21	0.002588	4.96738	0.002138	3.74838											
2197	39	38	22	22	0.002571	4.97251	0.002137	3.68343											
2198	39	38	23	20	0.002801	4.96317	0.002098	3.66129											
2199	40	39	19	19	0.00255	5.02663	0.002294	3.68828											
2200	40	39	18	18	0.002568	4.96749	0.002115	3.696											



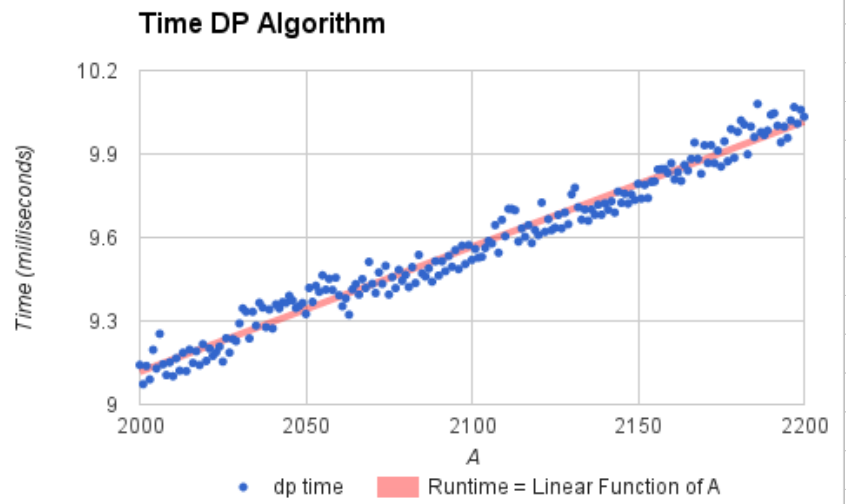
# problem6

amount	greedy coins	dp coins	greedy time	dp time
2000	67	67	0.004668	9.14199
2001	68	68	0.004666	9.07287
2002	67	67	0.004704	9.13838
2003	68	68	0.00476	9.09008
2004	67	67	0.004633	9.1965
2005	68	68	0.004627	9.12943
2006	67	67	0.00465	9.25391
2007	68	68	0.004637	9.14449
2008	67	67	0.004792	9.10587
2009	68	68	0.004623	9.1516
2010	67	67	0.004612	9.10162
2011	68	68	0.004648	9.1659
2012	68	68	0.004627	9.12151
2013	69	69	0.004629	9.18581
2014	68	68	0.004649	9.11992
2015	69	69	0.004693	9.19712
2016	68	68	0.004622	9.14917
2017	69	69	0.004651	9.19147
2018	68	68	0.004642	9.14143
2019	69	69	0.004685	9.21675
2020	68	68	0.004719	9.15636
2021	69	69	0.004608	9.20107
2022	68	68	0.005165	9.17452
2023	69	69	0.004661	9.18765
2024	68	68	0.004967	9.20762
2025	69	69	0.005185	9.15405
2026	68	68	0.004665	9.23819
2027	69	69	0.004613	9.18618
2028	68	68	0.004672	9.23532
2029	69	69	0.004686	9.22774
2030	68	68	0.004707	9.29129
2031	69	69	0.00469	9.34514
2032	68	68	0.00485	9.33325
2033	69	69	0.004674	9.23718
2034	68	68	0.004668	9.3331
2035	69	69	0.004931	9.28317
2036	68	68	0.004657	9.36545
2037	69	69	0.004883	9.34838
2038	68	68	0.004704	9.27761
2039	69	69	0.005307	9.34114
2040	68	68	0.005007	9.2732
2041	69	69	0.004604	9.35948
2042	69	69	0.004647	9.34525
2043	70	70	0.004674	9.36761
2044	69	69	0.004705	9.36521



# problem6

amount	greedy coins	dp coins	greedy time	dp time
2045	70	70	0.004689	9.39055
2046	69	69	0.004689	9.37382
2047	70	70	0.004667	9.34666
2048	69	69	0.004911	9.35353
2049	70	70	0.004647	9.36467
2050	69	69	0.004635	9.32516
2051	70	70	0.004633	9.41865
2052	69	69	0.004724	9.36851
2053	70	70	0.004659	9.42641
2054	69	69	0.004638	9.40486
2055	70	70	0.0046	9.46423
2056	69	69	0.004632	9.41257
2057	70	70	0.004661	9.45141
2058	69	69	0.005017	9.41142
2059	70	70	0.004586	9.45545
2060	69	69	0.004806	9.39254
2061	70	70	0.004608	9.35301
2062	69	69	0.004617	9.38122
2063	70	70	0.004631	9.3226
2064	69	69	0.005326	9.41352
2065	70	70	0.004637	9.43236
2066	69	69	0.004639	9.39467
2067	70	70	0.004682	9.45049
2068	69	69	0.004723	9.41853
2069	70	70	0.004615	9.51238
2070	69	69	0.004607	9.4337
2071	70	70	0.004606	9.40039
2072	70	70	0.004727	9.47459
2073	71	71	0.004607	9.43358
2074	70	70	0.004639	9.49813
2075	71	71	0.004614	9.3948
2076	70	70	0.004819	9.45741
2077	71	71	0.004609	9.41814
2078	70	70	0.005047	9.48418
2079	71	71	0.004702	9.44443
2080	70	70	0.004652	9.46565
2081	71	71	0.004649	9.42179
2082	70	70	0.004661	9.49367
2083	71	71	0.004766	9.43641
2084	70	70	0.004641	9.53738
2085	71	71	0.004744	9.47083
2086	70	70	0.004632	9.45993
2087	71	71	0.004857	9.48902
2088	70	70	0.004947	9.44133
2089	71	71	0.004596	9.51466



# problem6

amount	greedy coins	dp coins	greedy time	dp time					
2090	70	70	0.004833	9.46325					
2091	71	71	0.00463	9.5145					
2092	70	70	0.004772	9.47885					
2093	71	71	0.004717	9.53379					
2094	70	70	0.004699	9.49491					
2095	71	71	0.004654	9.5548					
2096	70	70	0.004635	9.48636					
2097	71	71	0.004694	9.57038					
2098	70	70	0.004612	9.50449					
2099	71	71	0.004622	9.57274					
2100	70	70	0.004691	9.51959					
2101	71	71	0.004983	9.55905					
2102	71	71	0.004607	9.52749					
2103	72	72	0.004907	9.53038					
2104	71	71	0.004695	9.56253					
2105	72	72	0.004613	9.58728					
2106	71	71	0.004695	9.57842					
2107	72	72	0.004687	9.64434					
2108	71	71	0.004627	9.54503					
2109	72	72	0.004645	9.66319					
2110	71	71	0.00499	9.6046					
2111	72	72	0.004717	9.70295					
2112	71	71	0.004644	9.70272					
2113	72	72	0.004788	9.69787					
2114	71	71	0.004643	9.58558					
2115	72	72	0.004699	9.6326					
2116	71	71	0.004769	9.60247					
2117	72	72	0.004685	9.64459					
2118	71	71	0.00465	9.58014					
2119	72	72	0.004583	9.62628					
2120	71	71	0.005029	9.60836					
2121	72	72	0.004614	9.7254					
2122	71	71	0.004669	9.62013					
2123	72	72	0.004606	9.66556					
2124	71	71	0.005242	9.62647					
2125	72	72	0.005113	9.63535					
2126	71	71	0.004762	9.681					
2127	72	72	0.004618	9.63262					
2128	71	71	0.004619	9.68954					
2129	72	72	0.004617	9.64742					
2130	71	71	0.004724	9.75501					
2131	72	72	0.004681	9.77895					
2132	72	72	0.004699	9.70856					
2133	73	73	0.004606	9.66388					
2134	72	72	0.004651	9.70047					

# problem6

amount	greedy coins	dp coins	greedy time	dp time					
2135	73	73	0.004719	9.66018					
2136	72	72	0.004929	9.70051					
2137	73	73	0.004627	9.68195					
2138	72	72	0.004755	9.71761					
2139	73	73	0.00461	9.68161					
2140	72	72	0.004606	9.72251					
2141	73	73	0.004638	9.69982					
2142	72	72	0.004716	9.73006					
2143	73	73	0.004618	9.68934					
2144	72	72	0.004635	9.76477					
2145	73	73	0.004621	9.72464					
2146	72	72	0.004616	9.75743					
2147	73	73	0.00464	9.72187					
2148	72	72	0.004927	9.75469					
2149	73	73	0.004587	9.73494					
2150	72	72	0.004665	9.79246					
2151	73	73	0.004632	9.73945					
2152	72	72	0.004973	9.78896					
2153	73	73	0.004607	9.74168					
2154	72	72	0.004678	9.79955					
2155	73	73	0.004639	9.8014					
2156	72	72	0.004592	9.84439					
2157	73	73	0.004646	9.84563					
2158	72	72	0.004613	9.84622					
2159	73	73	0.004553	9.83154					
2160	72	72	0.004565	9.86692					
2161	73	73	0.004622	9.80824					
2162	73	73	0.004633	9.83452					
2163	74	74	0.00459	9.80326					
2164	73	73	0.004926	9.86044					
2165	74	74	0.00462	9.84001					
2166	73	73	0.004647	9.88212					
2167	74	74	0.005151	9.94104					
2168	73	73	0.004637	9.88266					
2169	74	74	0.004962	9.82895					
2170	73	73	0.00465	9.93141					
2171	74	74	0.004632	9.86744					
2172	73	73	0.004943	9.93177					
2173	74	74	0.004636	9.86703					
2174	73	73	0.004605	9.91215					
2175	74	74	0.004597	9.85472					
2176	73	73	0.004721	9.94546					
2177	74	74	0.004614	9.87384					
2178	73	73	0.00465	9.9893					
2179	74	74	0.00463	9.88603					



# problem6

amount	greedy coins	dp coins	greedy time	dp time					
2180	73	73	0.004645	9.97963					
2181	74	74	0.004661	10.02038					
2182	73	73	0.00461	10.00576					
2183	74	74	0.004679	9.89876					
2184	73	73	0.004658	9.99825					
2185	74	74	0.004633	9.96107					
2186	73	73	0.004597	10.07991					
2187	74	74	0.004628	9.97831					
2188	73	73	0.0046	9.96791					
2189	74	74	0.004588	9.98425					
2190	73	73	0.004698	10.04097					
2191	74	74	0.004711	10.04625					
2192	74	74	0.004615	10.00162					
2193	75	75	0.004662	9.94201					
2194	74	74	0.004632	9.99835					
2195	75	75	0.004667	9.95757					
2196	74	74	0.005104	10.02062					
2197	75	75	0.004646	10.06864					
2198	74	74	0.004683	10.00938					
2199	75	75	0.004971	10.05886					
2200	74	74	0.004648	10.03387					

## LowValues

### Slow Algorithm

amount	[1, 5, 10, 25, 50]:Coins	[1, 5, 10, 25, 50]:Time	[1, 2, 6, 12, 24, 48, 60]:Coins	[1, 2, 6, 12, 24, 48, 60]:Time	[1, 6, 13, 37, 150]:Coins	[1, 6, 13, 37, 150]:Time	[1, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30]:Coins	[1, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30]:Time
10	1	0.008	3	0.294	5	0.518	1	0.003
11	2	0.63	4	0.549	6	1.006	2	0.075
12	3	1.133	1	0.002	2	1.842	1	0.003
13	4	2.083	2	1.015	1	0.002	2	0.146
14	5	4.491	2	2.237	2	3.759	1	0.003
15	2	8.619	3	4.437	3	7.883	2	0.293
16	3	16.725	3	8.446	4	14.802	1	0.002
17	4	33.34	4	16.084	5	29.587	2	0.579
18	5	65.313	2	32.174	3	59.23	1	0.003
19	6	128.785	3	63.587	2	118.774	2	1.08
20	2	258.035	3	122.771	3	229.5	1	0.002
21	3	502.905	4	251.62	4	458.397	2	2.128
22	4	1008.897	4	499.097	5	915.975	1	0.002
23	5	2002.284	5	987.249	6	1818.773	2	4.098
24	6	4021.655	1	0.002	4	3654.59	1	0.003
25	1	0.002	2	1974.664	3	7298.311	2	8.223
26	2	8031.583	2	3965.648	2	14554.762	1	0.003
27	3	16503.043	3	8529.867	3	30064.505	2	18.04
28	4	33163.29	3	16257.053	4	58806.331	1	0.006
29	5	65255.188	4	32021.954	5	116771.299	2	35.518
30	2	128.766689	2	62.3953	5	231.93289	1	0.000004
35	2	4072.610423	5	1990.510881	6	7411.213062	3	1.04513

### DP Algorithm

amount	[1, 5, 10, 25, 50]:Coins	[1, 5, 10, 25, 50]:Time	[1, 2, 6, 12, 24, 48, 60]:Coins	[1, 2, 6, 12, 24, 48, 60]:Time	[1, 6, 13, 37, 150]:Coins	[1, 6, 13, 37, 150]:Time	[1, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30]:Coins	[1, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30]:Time
10	1	0.01099	3	0.014	5	0.012	1	0.01873
11	2	0.01376	4	0.01596	6	0.01287	2	0.0202
12	3	0.01455	1	0.01752	2	0.01348	1	0.02139
13	4	0.0161	2	0.01845	1	0.01421	2	0.02458
14	5	0.01859	2	0.02111	2	0.01598	1	0.02605
15	2	0.01843	3	0.0215	3	0.01635	2	0.02863
16	3	0.02022	3	0.02543	4	0.01941	1	0.03285
17	4	0.02096	4	0.02503	5	0.01894	2	0.03487
18	5	0.02132	2	0.02733	3	0.02053	1	0.0378
19	6	0.02354	3	0.03055	2	0.02184	2	0.04351
20	2	0.02371	3	0.0289	3	0.02302	1	0.04429
21	3	0.02502	4	0.03071	4	0.02522	2	0.05124
22	4	0.02803	4	0.0327	5	0.02568	1	0.05064
23	5	0.02831	5	0.03393	6	0.02622	2	0.05642
24	6	0.02862	1	0.03757	4	0.02895	1	0.05852
25	1	0.0295	2	0.03697	3	0.02892	2	0.06388
26	2	0.03197	2	0.04065	2	0.02943	1	0.06531
27	3	0.03315	3	0.04313	3	0.03267	2	0.07273
28	4	0.03466	3	0.0427	4	0.03246	1	0.07688
29	5	0.04022	4	0.04646	5	0.03384	2	0.07857
30	2	0.03878	2	0.04668	5	0.03874	1	0.08696
35	2	0.04848	5	0.06122	6	0.04483	3	0.11115

## LowValues

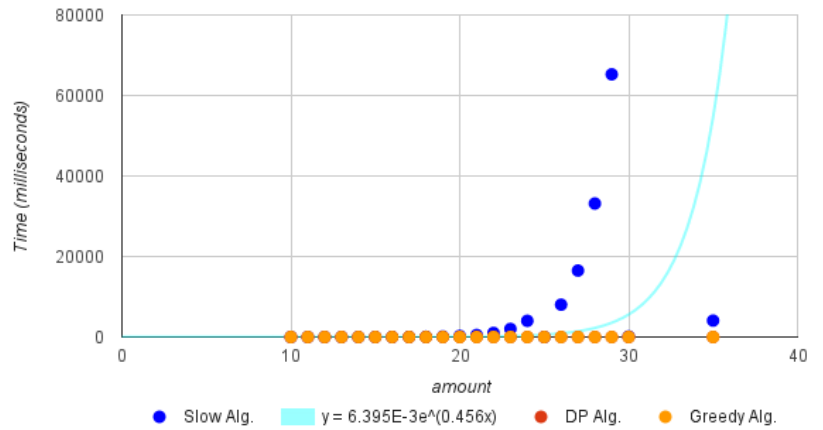
### Greedy Algorithm

amount	[1, 5, 10, 25, 50]:Coins	[1, 5, 10, 25, 50]:Time	[1, 2, 6, 12, 24, 48, 60]:Coins	[1, 2, 6, 12, 24, 48, 60]:Time	[1, 6, 13, 37, 150]:Coins	[1, 6, 13, 37, 150]:Time	[1, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30]:Coins	[1, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30]:Time
10	1	0.002211	3	0.002641	5	0.002167	1	0.005297
11	2	0.002194	4	0.002679	6	0.002238	2	0.005189
12	3	0.002216	1	0.00283	2	0.00226	1	0.00483
13	4	0.002161	2	0.002624	1	0.002162	2	0.004793
14	5	0.002153	2	0.002656	2	0.002125	1	0.005272
15	2	0.002258	3	0.002632	3	0.002163	2	0.005031
16	3	0.002141	3	0.002704	4	0.002116	1	0.004928
17	4	0.002144	4	0.00292	5	0.002324	2	0.00488
18	5	0.002291	2	0.002804	3	0.002258	1	0.004814
19	6	0.002149	3	0.002685	2	0.002283	2	0.005025
20	2	0.002282	3	0.002787	3	0.002086	1	0.004758
21	3	0.002182	4	0.002596	4	0.002121	2	0.004896
22	4	0.002341	4	0.002943	5	0.002111	1	0.004979
23	5	0.00218	5	0.002921	6	0.002363	2	0.005284
24	6	0.002371	1	0.002926	4	0.002366	1	0.005191
25	1	0.002338	2	0.002825	3	0.00235	2	0.004895
26	2	0.002132	2	0.002647	2	0.00218	1	0.005055
27	3	0.002192	3	0.002759	3	0.002225	2	0.004858
28	4	0.002138	3	0.00262	4	0.002165	1	0.004757
29	5	0.002346	4	0.002733	5	0.002224	2	0.004945
30	2	0.002187	2	0.002612	5	0.002183	1	0.004741
35	2	0.002196	5	0.002606	6	0.00217	3	0.005238

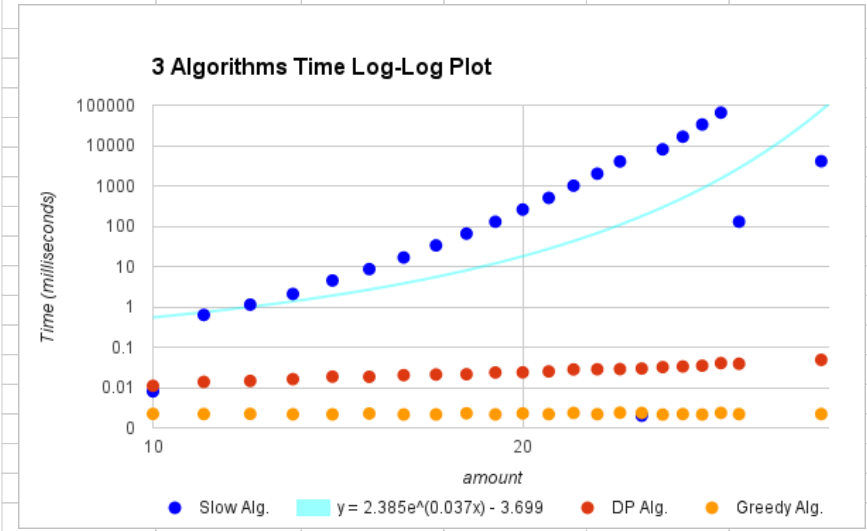
### Problem 1 time comparisons

Amount	Slow Alg.	DP Alg.	Greedy Alg.
10	0.008	0.01099	0.002211
11	0.63	0.01376	0.002194
12	1.133	0.01455	0.002216
13	2.083	0.0161	0.002161
14	4.491	0.01859	0.002153
15	8.619	0.01843	0.002258
16	16.725	0.02022	0.002141
17	33.34	0.02096	0.002144
18	65.313	0.02132	0.002291
19	128.785	0.02354	0.002149
20	258.035	0.02371	0.002282
21	502.905	0.02502	0.002182
22	1008.897	0.02803	0.002341
23	2002.284	0.02831	0.00218
24	4021.655	0.02862	0.002371
25	0.002	0.0295	0.002338
26	8031.583	0.03197	0.002132
27	16503.043	0.03315	0.002192
28	33163.29	0.03466	0.002138
29	65255.188	0.04022	0.002346
30	128.766689	0.03878	0.002187
35	4072.610423	0.04848	0.002196

### 3 Algorithms Time

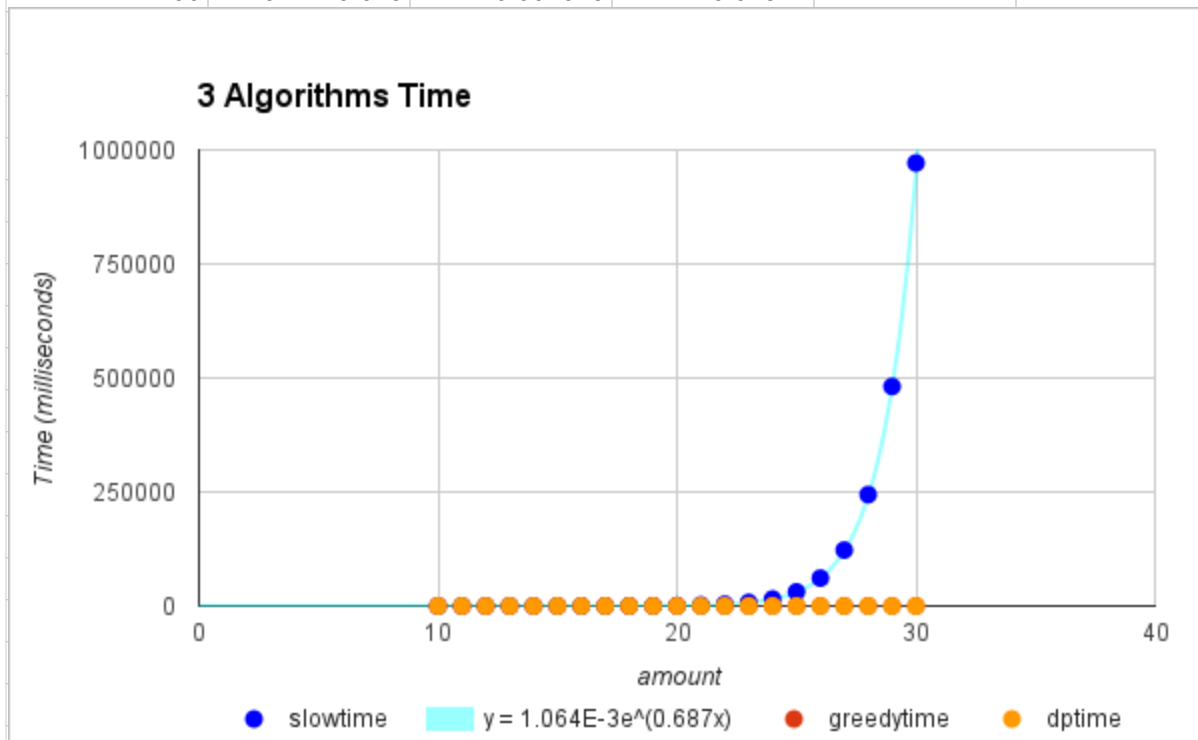


LowValues



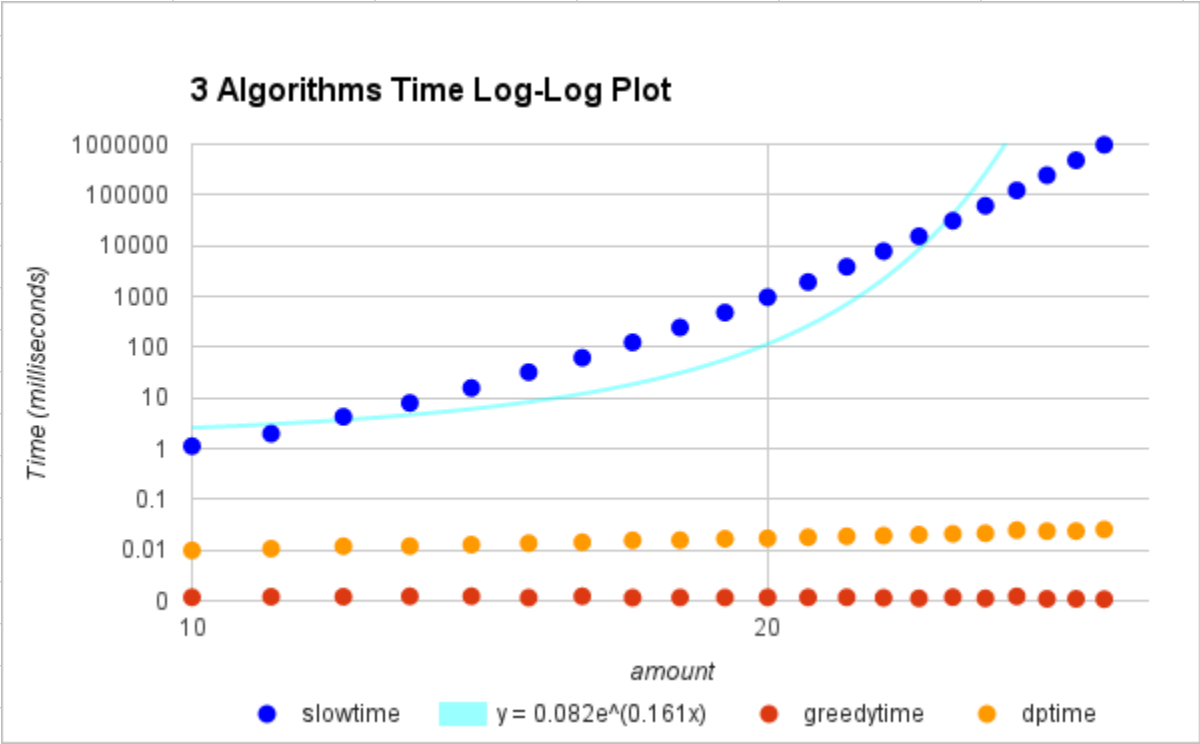
# Penny Only

amount	slowtime	greedytime	dptime			
10	1.117	0.00117	0.00984			
11	1.967	0.001199	0.01065			
12	4.241	0.001202	0.01189			
13	7.931	0.001225	0.01196			
14	15.672	0.001229	0.01278			
15	32.054	0.001151	0.01366			
16	61.709	0.001228	0.01426			
17	124.06	0.001149	0.01555			
18	243.982	0.00116	0.01566			
19	480.214	0.001158	0.01667			
20	963.19	0.001165	0.01704			
21	1916.949	0.001166	0.01793			
22	3838.9	0.001171	0.01869			
23	7768.46	0.001144	0.01929			
24	15313.587	0.001117	0.02015			
25	30947.424	0.001178	0.02086			
26	61082.748	0.001116	0.02142			
27	122581.667	0.001222	0.02469			
28	244188.997	0.001093	0.02356			
29	481349.882	0.001092	0.02366			
30	971419.625	0.001075	0.02547			



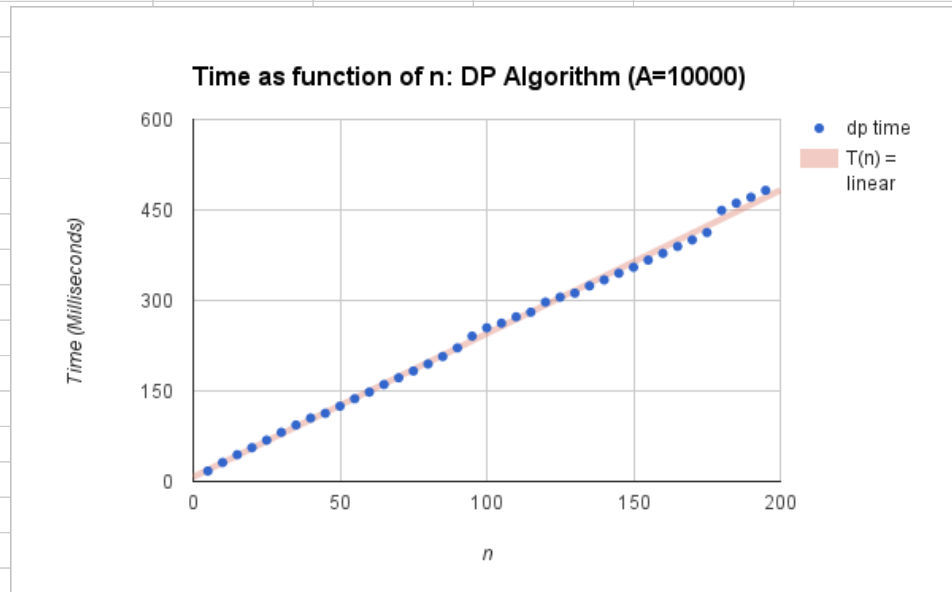
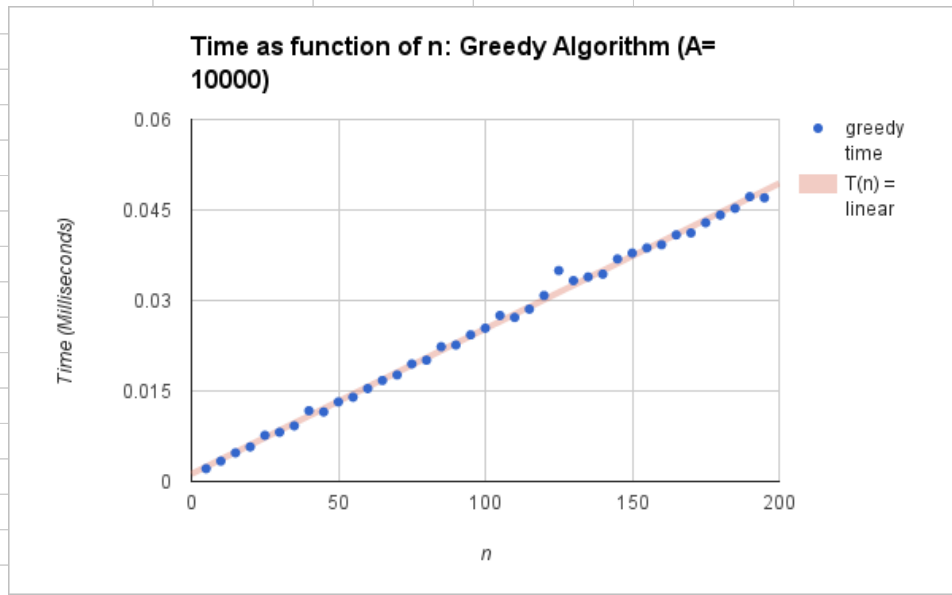
# Penny Only

amount	slowtime	greedytime	dptime			



## Problem 8

n	greedy time	dp time
5	0.002125	17.3555
10	0.003371	31.5552
15	0.004746	44.3823
20	0.00573	56.0113
25	0.007645	68.4563
30	0.008162	81.4617
35	0.009213	93.587
40	0.011733	105.1997
45	0.011521	113.0595
50	0.013189	124.8159
55	0.013972	137.1366
60	0.015398	148.1501
65	0.016747	160.6969
70	0.017662	171.8906
75	0.019478	183.0565
80	0.020109	194.7379
85	0.022343	207.1717
90	0.022623	221.4406
95	0.024308	240.8097
100	0.025404	254.6596
105	0.027513	262.4102
110	0.027187	272.9284
115	0.028556	280.623
120	0.030817	297.3106
125	0.034971	305.5011
130	0.033297	312.2042
135	0.033903	324.2806
140	0.034365	334.1839
145	0.036891	345.2021
150	0.037856	355.1331
155	0.038717	367.0361
160	0.039239	378.2038
165	0.040875	389.6809
170	0.041195	400.499
175	0.042885	412.6342
180	0.044148	449.4021
185	0.045284	461.3423
190	0.047214	471.194
195	0.047025	482.5027



Problem 8

