**Project 1**

**Part A**

1. Formula: Pn+1 = (1.005 + 0.0002n)\*Pn -200
2. Loan paid off within 68 months; $6.47 left to pay by month 67, advised to pay $206.47 in month 67.
3. Iterates

|  |  |
| --- | --- |
| 0 | 10000 |
| 1 | 9850 |
| 2 | 9701.22 |
| 3 | 9553.606588 |
| 4 | 9407.106785 |
| 5 | 9261.668004 |
| 6 | 9117.238012 |
| 7 | 8973.764888 |
| 8 | 8831.196983 |
| 9 | 8689.482883 |
| 10 | 8548.571367 |
| 11 | 8408.411366 |
| 12 | 8268.951928 |
| 13 | 8130.142173 |
| 14 | 7991.931253 |
| 15 | 7854.268317 |
| 16 | 7717.102463 |
| 17 | 7580.382704 |
| 18 | 7444.057918 |
| 19 | 7308.076816 |
| 20 | 7172.387892 |
| 21 | 7036.939383 |
| 22 | 6901.679226 |
| 23 | 6766.55501 |
| 24 | 6631.513939 |
| 25 | 6496.502775 |
| 26 | 6361.467803 |
| 27 | 6226.354775 |
| 28 | 6091.108864 |
| 29 | 5955.674618 |
| 30 | 5819.995904 |
| 31 | 5684.015859 |
| 32 | 5547.676837 |
| 33 | 5410.920353 |
| 34 | 5273.687029 |
| 35 | 5135.916536 |
| 36 | 4997.547534 |
| 37 | 4858.517614 |
| 38 | 4718.763232 |
| 39 | 4578.219649 |
| 40 | 4436.820861 |
| 41 | 4294.499532 |
| 42 | 4151.186926 |
| 43 | 4006.81283 |
| 44 | 3861.305485 |
| 45 | 3714.591501 |
| 46 | 3566.595782 |
| 47 | 3417.241442 |
| 48 | 3266.449718 |
| 49 | 3114.139884 |
| 50 | 2960.229155 |
| 51 | 2804.632592 |
| 52 | 2647.263007 |
| 53 | 2488.030858 |
| 54 | 2326.844139 |
| 55 | 2163.608276 |
| 56 | 1998.226009 |
| 57 | 1830.59727 |
| 58 | 1660.619065 |
| 59 | 1488.185342 |
| 60 | 1313.186856 |
| 61 | 1135.511032 |
| 62 | 955.0418219 |
| 63 | 771.6595496 |
| 64 | 585.2407577 |
| 65 | 395.6580432 |
| 66 | 202.7798879 |
| 67 | 6.470481906 |
| 68 | -193.4104612 |

1. Time Series Graph

**Part B**

1. Formula: Pn+1 = [(1.005 + 0.0002n)\*Pn] – [150 – 50 (-1)n+1]
2. Loan paid off within 140 months. $94.95 left after month 139; $98.07 left in month 140.
3. Iterates

|  |  |
| --- | --- |
| n | Pn |
| 0 | 10000 |
| 1 | 9850 |
| 2 | 9801.22 |
| 3 | 9654.146588 |
| 4 | 9608.209809 |
| 5 | 9463.937426 |
| 6 | 9420.72105 |
| 7 | 9279.129521 |
| 8 | 9238.51595 |
| 9 | 9099.490155 |
| 10 | 9061.366688 |
| 11 | 8924.796255 |
| 12 | 8889.054788 |
| 13 | 8754.833793 |
| 14 | 8721.37053 |
| 15 | 8589.39722 |
| 16 | 8558.112398 |
| 17 | 8428.28892 |
| 18 | 8399.086547 |
| 19 | 8271.318691 |
| 20 | 8244.106295 |
| 21 | 8118.303252 |
| 22 | 8092.991642 |
| 23 | 7969.065764 |
| 24 | 7945.568795 |
| 25 | 7823.435369 |
| 26 | 7801.669723 |
| 27 | 7681.246754 |
| 28 | 7661.13172 |
| 29 | 7542.339716 |
| 30 | 7523.796985 |
| 31 | 7406.558752 |
| 32 | 7389.51221 |
| 33 | 7273.752649 |
| 34 | 7258.12818 |
| 35 | 7143.774093 |
| 36 | 7129.499382 |
| 37 | 7016.479274 |
| 38 | 7003.483617 |
| 39 | 6891.727511 |
| 40 | 6879.941623 |
| 41 | 6769.380864 |
| 42 | 6758.736691 |
| 43 | 6649.303763 |
| 44 | 6639.734294 |
| 45 | 6531.362628 |
| 46 | 6522.801704 |
| n | Pn |
| 47 | 6415.425488 |
| 48 | 6407.807616 |
| 49 | 6301.361607 |
| 50 | 6294.621758 |
| 51 | 6189.041085 |
| 52 | 6183.114509 |
| 53 | 6078.334473 |
| 54 | 6073.156491 |
| 55 | 5969.112363 |
| 56 | 5964.618161 |
| 57 | 5861.244975 |
| 58 | 5857.369393 |
| 59 | 5754.601725 |
| 60 | 5751.279034 |
| 61 | 5649.050777 |
| 62 | 5646.214451 |
| 63 | 5544.458582 |
| 64 | 5542.041053 |
| 65 | 5440.689384 |
| 66 | 5438.621793 |
| 67 | 5337.604709 |
| 68 | 5335.816636 |
| 69 | 5235.062825 |
| 70 | 5233.482007 |
| 71 | 5132.918165 |
| 72 | 5131.470193 |
| 73 | 5031.020715 |
| 74 | 5029.628721 |
| 75 | 4929.21537 |
| 76 | 4927.799677 |
| 77 | 4827.341231 |
| 78 | 4825.818992 |
| 79 | 4725.230863 |
| 80 | 4723.515665 |
| 81 | 4622.709494 |
| 82 | 4620.710935 |
| 83 | 4519.594149 |
| 84 | 4517.217383 |
| 85 | 4415.692722 |
| 86 | 4412.837962 |
| 87 | 4310.802964 |
| 88 | 4307.364951 |
| 89 | 4204.711399 |
| 90 | 4200.578819 |
| 91 | 4097.192132 |
| 92 | 4092.246989 |
| 93 | 3988.005569 |
| n | Pn |
| 94 | 3982.1225 |
| 95 | 3876.897015 |
| 96 | 3869.942544 |
| 97 | 3763.595153 |
| 98 | 3755.426875 |
| 99 | 3647.810376 |
| 100 | 3638.276074 |
| 101 | 3529.232975 |
| 102 | 3518.169646 |
| 103 | 3407.531155 |
| 104 | 3394.763953 |
| 105 | 3282.348863 |
| 106 | 3267.689933 |
| 107 | 3153.30341 |
| 108 | 3136.55062 |
| 109 | 3019.982866 |
| 110 | 3000.918407 |
| 111 | 2881.943204 |
| 112 | 2860.332059 |
| 113 | 2738.705157 |
| 114 | 2714.29342 |
| 115 | 2589.750777 |
| 116 | 2562.263799 |
| 117 | 2434.519638 |
| 118 | 2403.659996 |
| 119 | 2272.404671 |
| 120 | 2237.849926 |
| 121 | 2102.747574 |
| 122 | 2064.147803 |
| 123 | 1924.833748 |
| 124 | 1881.808827 |
| 125 | 1737.88673 |
| 126 | 1690.023332 |
| 127 | 1541.062037 |
| 128 | 1487.910323 |
| 129 | 1333.440379 |
| 130 | 1274.510342 |
| 131 | 1114.020163 |
| 132 | 1048.777592 |
| 133 | 881.7092084 |
| 134 | 809.5712194 |
| 135 | 635.3155842 |
| 136 | 555.6456829 |
| 137 | 373.5374739 |
| 138 | 285.640088 |
| 139 | 94.95195489 |
| 140 | -1.933620993 |

1. Time Series Graph

**Part C**

1. Formula: Pn+1 = [(1.005 + 0.0002n)\*Pn] – [400- (200/(2^(n-1)))]
2. Loan paid off within 30 months. $376.41 is left for repayment by month 29.

|  |  |
| --- | --- |
| n | Pn |
| 0 | 10000 |
| 1 | 10050 |
| 2 | 9902.26 |
| 3 | 9655.732204 |
| 4 | 9359.804304 |
| 5 | 9039.091169 |
| 6 | 8705.825716 |
| 7 | 8366.051836 |
| 8 | 8022.719568 |
| 9 | 7677.232017 |
| 10 | 7330.218444 |
| n | Pn |
| 11 | 6981.920598 |
| 12 | 6632.385739 |
| 13 | 6281.56305 |
| 14 | 5929.351757 |
| 15 | 5575.625115 |
| 16 | 5220.242323 |
| 17 | 4863.054414 |
| 18 | 4503.907122 |
| 19 | 4142.64225 |
| 20 | 3779.098264 |
|  |  |
| n | Pn |
| 21 | 3413.11053 |
| 22 | 3044.511338 |
| 23 | 2673.12984 |
| 24 | 2298.791934 |
| 25 | 1921.320119 |
| 26 | 1540.533332 |
| 27 | 1156.246778 |
| 28 | 768.2717472 |
| 29 | 376.4154292 |
| 30 | -19.51928344 |

1. Time Series Graph