E28

From the result of experimentation, the design 1 which directly writes the code in one file is averagely faster than the abstract method. In other words, the efficiency of the design 1 is higher than the design 5. The efficiency of the result is exactly the same as the hypotheses we made in E26. The design 1 is more efficient than design 5. However, in our group’s code, the code of design 5 is more complicated than design 1 which is different from the hypotheses.

E29

|  |  |  |
| --- | --- | --- |
|  | Cartesian | Polar |
| Initializing CP | The average time is 4040.67ms. | The average time is 3911ms. |
| CP5 | The average time is 10549.33ms. | The average time is 3910.67ms. |
| Getting cartesian CP | The average time is 18.67ms. | The average time is 62ms. |
| CP5 | The average time is 23ms. | The average time is 16ms. |
| Getting polar CP | The average time is 2744.33ms. | The average time is 30ms. |
| CP5 | The average time is 16.67ms. | The average time is 15.33ms. |

|  |  |  |
| --- | --- | --- |
|  | Cartesian | Polar |
| initializing | Design 5 is faster than Design1. | Design 5 is faster than Design1. |
| getting Cartesian | Design 5 is faster than Design1. | Design 5 is faster than Design1. |
| getting Polar | Design 5 is faster than Design1. | Design 5 is faster than Design1. |

E30

|  |  |  |  |
| --- | --- | --- | --- |
| Design Name | |  |  | | --- | --- | | operations | The average time(ms) | |
| Design 1  CP | |  |  | | --- | --- | | initializing Cartesian | 4040.67 | | initializing Polar | 3911 | | getting Cartesian from Cartesian | 18.67 | | getting Polar from Cartesian | 2744.33 | | getting Cartesian from Polar | 62 | | getting Polar from Polar | 30s | |
| Design 5  CP5 | |  |  | | --- | --- | | initializing Cartesian | 10549.33 | | initializing Polar | 3910.67 | | getting Cartesian from Cartesian | 23 | | getting Polar from Cartesian | 16.67 | | getting Cartesian from Polar | 16 | | getting Polar from Polar | 15.33 | |

Conclusion:

According to the results of the testing for 5 times, when running the same numbers of points, design 5 is way faster than design 1, whether it is using Cartesian coordinates or Polar coordinates. This is also the same as our previous assumption in E26.