



## University Admissions,

I am honored to introduce you to Manu Bhat whom I have known as a top student in my AP Computer Science A class as well as my top Teacher Assistant two years in a row. Manu is a brilliant young man who is proactive, passionate about computer science, and has built an impressive skillset throughout his tenure in high school.

As a student in my class, Manu earned the 2nd highest grade in his class of 34 students first semester and the 7th highest grade second semester. That's an extremely strong position and Manu was one of the students I regularly checked my work and test keys against. Manu always came to class prepared and he read our lessons ahead of schedule, often working on labs before I assigned them. He was one of the few students able to keep that practice up all year long and he was one of the few students to ask me questions about topics and lessons before I taught them. Manu actively questions everything he is given and he connects it to what he already knows in a deeper way than most students. As a learner, Manu reads at a deep level and follows tangential paths he notices along the way. For example, when learning about data types, Manu wanted to know how data is stored internally so he researched twos complement and how adders work in circuitry. This nature made Manu one of my top students overall because it meant that he was always engaged, asking deep questions, and thinking about the subtle details of the algorithms and concepts we covered. His thoroughness is impressive and his bandwidth for complex work is extremely high.

Another of Manu's unique traits is his coding professionalism. Manu went out of his way to write code that was extendable, reusable, and followed professional design patterns the entire year. This wasn't even required for many projects but because Manu does so much coding as a hobby, he pays attention to the overall design details and thinks ahead for potential future use. For example, in Manu's end-of-year game project, he wrote a level loader that could load any level from an editable data file thereby making future levels easy to create. He also organized his project into lots of independent parts, most of which were generalized for future extendability. Manu's project included versions of pathfinding and pixel perfect collision detection, both of which he coded on his own. I awarded his project with an Honorable Mention on account of its thoughtfulness, code organization, and implementation of advanced algorithms.

As a problem solver, Manu is efficient and accurate. For one of our most complex algorithms of the year, "Big Problem," Manu planned out a clever strategy in pseudocode and finished the problem before anyone else because his strategy included insights and forethoughts that others had overlooked. Because Manu had less debugging to do, he finished the problem before anyone else. Likewise, Manu was typically one of the first students to finish quizzes and exams, which are notably rigorous and lengthy. In general, Manu's performance in my class was extraordinarily strong and he paid attention to the smallest details and logical nuances that other students rarely notice until they are pointed out. For this reason, I asked Manu to be a Teacher Assistant for me the following year.



As my Teacher Assistant two years in a row, both times by my request, Manu has been my strongest TA ever. Manu is literally worth five TAs and when I review the work my TAs have graded, Manu's name is always the most prevalent by a long shot. This is because (a) Manu never wastes time (b) Manu is proactive and gets started on work before I ask him (c) Manu creates his own tasks and decides what needs to get done without me having to direct him. As a TA, Manu creates handwritten autograders, organizes grading templates, and creates grading rubrics that all my other TAs in all other classes use as their guide. Manu is able to identify edge cases and subtle grading details that even my best TAs overlook. It will be a while before I encounter another TA as skilled and prolific as Manu. I asked Manu how he's able to be so productive and he said he minimizes context switching by focusing on one thing at a time. For example, he'll run student code through his autograder and then give feedback all at once to students who had similar errors. Thanks to Manu and the TAs who follow his lead, my students receive constructive feedback for nearly every lab exercise.

Outside of class, Manu spends much of his time staying connected to Computer Science. For example, for the past three years, Manu has been a top contributor to our AP Computer Science Slack channel. This is an online forum where students ask homework questions and help each other with the main concepts. Manu has been answering questions on that channel as a top contributor for three years. Manu also builds his skills by constantly self-studying computer science through online videos, courses, and other resources freely available. He competes in the Gold Division of the United States Computing Olympiad and he is an advanced mentor in our school's Competitive Programming Club. Furthermore, he leads others as an Android mentor and Public Relations Officer in our school's Tinovation club, which I'm the advisor for. Every Saturday, Manu spends a couple hours at the city library teaching Android development to club members. Furthermore, Manu is president of our school's Game Development Club and he is a lead officer for MelonJam – a game development hackathon sponsored by the club that has attracted about a hundred participants during each of the last two years they've run it. Throughout his high school career, Manu has been an independent learner and has taken initiative to continuously grow his skillset.

If you want a brilliant student who performs at the top of his class and has demonstrated loyalty and passion for computer science, I very highly recommend Manu. He is among the strongest students I have had over the last four years and he is capable of rigorous academic work. You can expect Manu to be the same proactive, passionate, and connected student he has been for the past four years. Manu has my highest recommendation.

A handwritten signature in black ink that reads 'Eric Ferrante'.

Eric Ferrante  
Computer Science Teacher  
Cupertino High School  
(408) 366-7380 x4845  
[eric\\_ferrante@fuhisd.org](mailto:eric_ferrante@fuhisd.org)