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# Post Secondary and Career Plans

## University

In September of 2019 I plan to go to the University of Waterloo for Computer Science. Ever since I have come to Port Credit Secondary School I have been interested in computer and electronics. Through Grade 11 Computer Science with Ms. Li and Grade 11 Computer Engineering with Mr. Knowles I have learned that the best place to pursue my interests is at the University of Waterloo with their prestigious computer science faculty. My interests in computer science were also strengthened by studying and taking the AP test which exposed me to high level computer programming concepts which really interested me, I got a 5/5 on the AP Computer Science A test.

## Career Plans

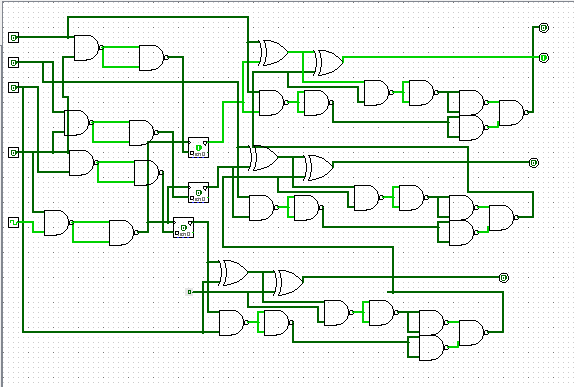
I have always been interested in computer systems and programming. The computer science field has such a massive scope as it is ingrained in every aspect of our life that a computer science degree provides me with a significant amount of choice. I am very interested in machines and robotics so perhaps I may pursue a job, developing and programming robotic systems for manufacturing plants.

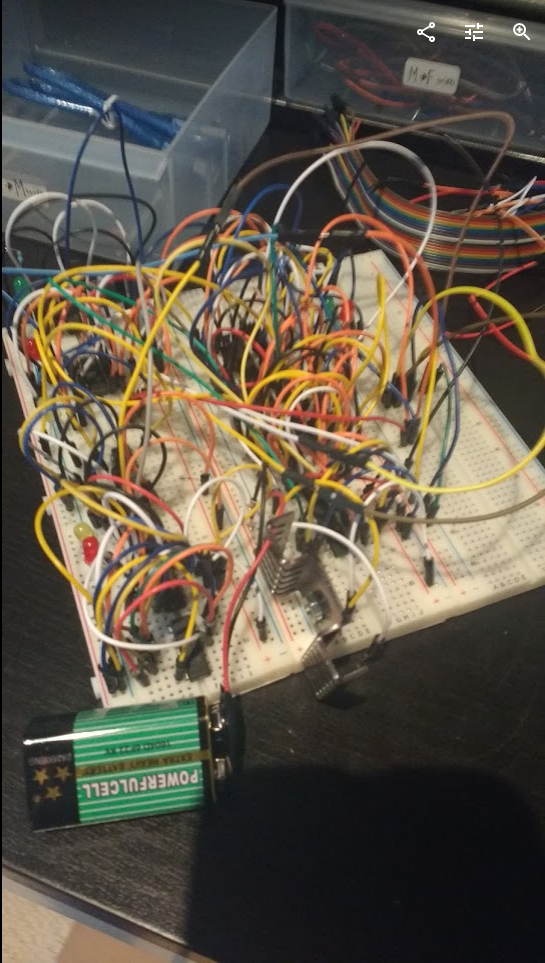
# Science Project: Determining the Chemical Composition of a Chocolate Cake

In Grade 11 Chemistry we were tasked with baking some sort of baked good and determining the chemical composition of said baked good. I decided to bake a chocolate cake for my project, and it was a truly wonderful experience. Before we were to bake the cake, the first step in our project was to develop some recipe and calculate the chemical makeup of whatever substance we were going to make. Once we had done the calculations then we had to bake the product and perform some measurements. The cake I made was truly delicious however when I weighed the mass of my final cake there was an anomaly, the mass of my cake did not match my hypothesis. I had predicted a cake of mass 2049g but rather I got cake of 1923g, the law of conservation of energy and mass dictates this is impossible. This anomaly actually taught me a lot about the scientific process. I had my hypothesis and predicted that my reactants going into my cake should result in the same mass of product coming out of the oven but this was not the case, I learned about the struggles of designing a perfect experiment. The experiment I devised was flawed and had serious issues which resulted in some of the mass of the cake dissipating, whether evaporating in the oven or due to simple measurement errors caused by human error. This was one of the first labs in high school that we as students were able to devise and perform ourselves and it taught me so much about the scientific process and how to design a proper experiment. The lab was also very interesting as it was able to mix the chemistry principles, we were learning in class with the added fun of designing a recipe, baking and eating a cake. I would say this was one of the best projects I had in Grade 11 as I learned, I was challenged and I had a lot of fun.

# Technology Project: Four-bit Calculator

At the end of every Computer Engineering course our teacher, Mr Knowles provides us with an opportunity to develop our own personal project. I decided to challenge myself and create a circuit completely on my own without any input from mentors or the internet. I decided to build myself a 4 bit calculator out of the most basic electrical gate, the NAND Gate(NOT AND). The NAND gate is a logic gate which can be used to make any logic circuit as using NAND gates you can make other logic gates. As can been seen in the evidence attached, a NAND gate can be used to make any logic circuit however it often can be quite difficult and long to produce a logic circuit that would otherwise be solved in a single chip. Nevertheless, I decided to embark on this challenge because I needed a reason to challenge myself, a project that would truly test my electrical engineering skills. I worked for hours and hours, working every day in class and often spending late nights at home attempting to develop this circuit and optimize it. By the end of the school year I was finished, and the circuit worked. I had developed a circuit which could add, subtract and multiply any two 4 bit binary numbers. I loved this project as it gave me the opportunity to test myself and create something that may not practically be a fantastic idea but was cool to me and a testament to my skill and dedication.



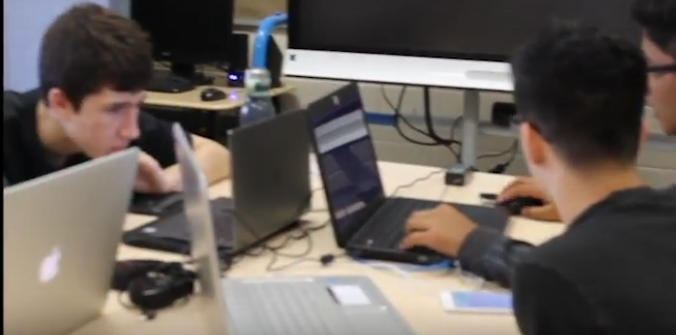


# Extracurricular Involvement: Reach for the Top

I joined the Reach for the Top team this year and I had an amazing time. I have always known that I enjoyed learning and testing my knowledge specifically in the area of history, but I have never had a non academic outlet for this. I joined the trivia club in October, and we had meetings every Tuesday where we would practice answering trivia questions and testing our reaction times on the buzzers. As the school year marched on, we kept having more and more practices until we reached the spring where we would compete in our regional competitions. I made it on the Port Credit B team this year and we competed in several matches however were unable to make it to the provincial championships. This year in reach for the top was a fantastic experience I grew my knowledge and had the opportunity to meet people from around the school as well as people outside of our school who I would have never met otherwise. I hope to participate in reach for the top next year as an executive member and perhaps achieve more success on the Port Credit A team.

# Sci-Tech Extracurricular: PCHack Day

This year I decided to participate in PCHack Day 2018. PCHack Day 2018 was a hackathon hosted at Applewood public school by Port Credit’s PCHacks club. The hackathon was all day beginning at 8am and ending at 5pm. In that time me and my team(Alex, Tarj and Veer) were tasked with develop some sort of application to solve an issue in one of the four categories: Assistive Technology, Data Science, Transportation, Finance and Economics. We came up with the idea to develop a software which can access the internet from anywhere without the need for a wi-fi or ethernet connection. This system used the SMS protocol, what is commonly used for texting to send a request packet to the server and then the server returns the data over texting. This system has numerous applications, if someone is lost and they do not have access to the internet they could use our application to access google maps(google maps implementation code is attached). We developed this software in PHP using the API twilio and were able to develop a system that had numerous different services including: Wikipedia lookup, weather information, Google maps directions and accessing the news. At the end of the day we got judged and came second place. This was a terrific event that allowed me and my team to create something we would never had made elsewhere and it truly pushed our technical and creative bounds, developing an application that had never been created before.



<?php

#$gmap = new GoogleMaps("365 Orano Ave Mississauga,70 Mineola Rd. Mississauga");

#echo $gmap->getHeader();

#echo $gmap->getDirections();

class GoogleMaps{

//This is the google maps API KEY

private $APIKEY = "AIzaSyBl7-D9TPPYlnvmdElOIh6pBDAkV6GPC4k";

//DO NOT CHANGE THIS ^^^^

private $loc1 = "";

private $loc2 = "";

function \_\_construct($input){

$this->decode($input);

}

function decode($s){

$index = strpos($s,",");

$loc1 = substr($s,0,$index);

$loc2 = substr($s,$index + 1);

$loc1 = str\_replace(' ', '+', $loc1);

$loc2 = str\_replace(' ', '+', $loc2);

$this->loc1 = $loc1;

$this->loc2 = $loc2;

}

public function getDirections(){

$output = "";

$first = $this->loc1;

$second = $this->loc2;

$url = "https://maps.googleapis.com/maps/api/directions/json?origin=" . $first . "&destination=" . $second . "&key=" . $this->APIKEY;

$json = file\_get\_contents($url);

$data = json\_decode($json);

$route = $data->routes[0]->legs[0]->steps;

foreach($route as $data){

$output .= " " . strip\_tags($data->html\_instructions) . " \n ";

}

return $output;

}

public function getHeader(){

$output = "";

$first = $this->loc1;

$second = $this->loc2;

$url = "https://maps.googleapis.com/maps/api/directions/json?origin=" . $first . "&destination=" . $second . "&key=" . $this->APIKEY;

$json = file\_get\_contents($url);

$data = json\_decode($json);

$route = $data->routes[0]->legs[0];

$output .= $route->start\_address . " -> " . $route->end\_address . "\n";

$output .= "This will take a total of " . $route->distance->text . " and driving will take " . $route->duration->text . "\n";

return $output;

}

}