**Summer Program**

**(at Queen of Heaven Parish)**

**I) When:**

**A) Summer 2024, June/July/Aug(1st-9th)**

**B) 8:30am to 4:00pm broken into 2 sessions:**

**1) 8:30am to 12:00pm**

**2) 12:00pm to 12:30: (Lunch)**

**3) 12:30pm to 4:00pm**

**II) What:**

**A) A Project centered Program:**

**1) Design an 8-bit Computer from 74LS—series Integrated Circuits**

**2) Create Schematics from the Engineer’s design (Drafting)**

**3) Build the 8-bit Computer from the Schematics (Technician)**

**4) Run required test at Design and Build stages (Quality Control)**

**5) Program the Computer at both the Design and Build stages(Computer Programming)**

**6) Document all their work, which would include written material plus: images/videos and possibly creating a web site on github.com!**

**B) Supplied Material:**

**1) Hardware:**

**a) All necessary Electronic Supplies:**

**i) IC’s, Resistors, Capacitors,**

**ii) Breadboards, Wires, Jumper Cables**

**b) Tools:**

**i) Pliers, Wire Cutters**

**ii) Multimeters(3), Oscilloscope(1)**

**c) Laptops (w/Linux Mint OS)**

**2) Software:**

**a) Written Material:**

**i) List of Responsibilities for every position**

**(see attachment A)**

**ii) Aides for Management (see attachment B)**

**b) Computer Software:**

**i) “Digital”: Digital Electronic Simulator**

**ii) “Fritzing”: Electronic Drafting**

**iii) “ Libre Office”: for documenting their work**

**iv) “Sublime Text 3 and/or Visual Studio Code”: Computer Programming IDE’s**

**v) “GIMP”: photo/image**

**vi) “DaVinci Resolve”: professional Video Editing Software**

**vii) “Inkscape”: Vector imaging software**

**viii) “Arduino IDE”: for programming all EEPROM’s**

**III) How will the program be run?**

**A) Week One: Introductory Project which should prepare them for the above project.**

**1) The project:**

**a) Design/Draft/Build: A Binary Coded Decimal (BCD) Number converter to a 7-Segment Display (1-9)**

**b) Given the following parts:**

**I) 4-bit DIP Switch**

**ii) 74LS48 IC**

**iii) 7-Segment Display**

**2) This should provide all the instructions they will need for the 8-bit Computer Project.**

**B) The Students will:**

**1) Form a company**

**2) Each person will have a managerial position:**

**a) CEO**

**b) Department Managers**

**i) Engineering Dept**

**ii) Drafting Dept**

**iii) Technician Dept**

**iv) Computer Dept**

**v) Quality Control Dept**

**c) Each person, in turn, will be a “worker” in all other Departments.**

**i) Example: the CEO will be a “worker” in all Departments and will be assigned a project within those Departments.**

**ii) The Engineering Dept Manager will be a “worker” in all other Departments and will be assigned a specific project within those Departments.**

**d) The CEO, all Managers and workers will receive:**

**i) a detailed list of responsibilities**

**ii) a list of suggestions.**

**e) The emphasis here is to foster “cooperation” among the students.**

**3) If more than 8 students want to participate, the option of**

**forming TWO companies of 6 students each should be possible. Would be interesting to see them compete!**

**IV) Who:**

**A) High School Age Students:**

**1) Chesterton Academy**

**2) Members of Queen of Heaven Parish?**