

TALENT IDENTIFICATION USING ARTIFICIAL INTELLIGENCE

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Abstract

As we all know, it is very tough to find out or calculate, students' field of interest. In this Research Paper we focussed on issue and find a way to calculate the same. We designed an Algorithm SR Z V1.0 and developed a Windows Based Application implementing the same. The application is capable enough to calculate Students' field of Interest. To develop the application, we have used PHP for designing Frontend and MySQL in Backend. For data, we have done a survey among students who appeared in +2 studying at ELITE Institute in 2015. In the survey, we prepared a list of 15 Questions keeping in mind four parameters which includes Genetic, Financial Condition, Environment, Geographical Location and Food Habits. When we analyzed the data applying the algorithm, we found that it's working with accuracy of around 90%. In this survey, 150 students took part actively. After 4 years from the first Survey i.e. in 2015 we have done a new Survey on the same candidates who actively participated in the last Survey and checked whether they achieved their goal or not. As a result of the Survey, we found that 90% of the students have achieved their goals in their life. In this way, we achieved our Research Goal.

Keywords: SR Z V1.0, FoI, Survey, Elite, VPS, Raks

1. Introduction

SR Z V1.0 is an efficient algorithm to calculate Students' Field of Interest (i.e. FOI). As we have discussed in the Abstract Section, we designed and developed an application in which SR Z V1.0 is implemented. We kept in mind that possible parameters which have to be considered in calculating or finding Student's Field of Interest are Genetic, Financial Condition, Environment, Geographical and Food Habits. Genetic parameter describes the occupation of Student's father and mother. Financial Condition involves father's salary, family's income, total number of dependents, earning members. We calculated Per Capita Income (i.e. PCI) using formula: **Family Income / Total Number of Dependents**.

Environment involves locality or area where they stay (for e.g. he / she may stay in an Apartment, Government Quarter, Housing Colony). Geographical parameter includes Home Town of the Student. Hood Habits describes whether the student is Vegetarian, Eggetarian

and Non Vegetarian. We conducted a Survey at ELITE Institute among the students who appeared in +2 final exams. There were around 150 students, who took part in the survey actively. We made a survey report on the basis of survey, we carried out. Here, it should be noted that we assigned certain points to the options of different questions. For instance, there's a question which we have asked in the survey, that "What is your Father's Occupation???" It has five options – 1. Engineer 2. Doctor 3. Teacher 4. Politics 5. Business. We assigned 7 points to Engineer & Teacher, 8 points to Doctor, 9 points to Business, 10 points to Politics. After analyzing the data, we calculated or found the student's field of interest as a result.

2. Basis of Research

Artificial Intelligence: Artificial Intelligence ^[1] is an emerging technology in today's world which enhances the ability of a machine so that it can take decision on its own. In another words, we can say that Artificial Intelligence is the property of machines, computer programs, and systems to perform the intellectual and creative functions of a person, independently find different ways to solve problems. It will help to draw conclusions and making itself capable of taking decisions just like Human's Brain which works in a particular situation to resolve the issue. Here it should be noted that AI is the acronym for Artificial Intelligence. Artificial Intelligence ^[2] has a long history which is growing very fast and enhancing itself. While designing an AI System, one should keep in mind few important points initially. These points include to make clear what the system can do and how efficient the designed Artificial Intelligence. There are two main goals of Artificial Intelligence which includes (a) To create Expert Systems that means the system exhibits intelligent behaviour, learn, demonstrate, explain and advice its users. (b) To implement Human Intelligence in machine creating systems that understand, think, learn and behave like human.

1971	Artificial Intelligence System
1970	First Expert System was developed
1958	LISP programming Language developoed
1956	Birth of Artificial Intelligence @ Dartmouth Conference
1941	First Electronic Computer was developed

Figure 1: Short history of Artificial Intelligence

Intelligence: Intelligence is the ability to acquire and apply different skills along with knowledge to solve a given problem. Intelligence is also concerned with the use of general capability to solve and learning various situations ^{[3], [4], [5], [6], [7], [8], [9], [10], [11], [12], [13], [14], [15], [16], [17], [18], [19], [20], [21], [22], [23]}. Intelligence is constituted with various cognitive functions such as Language attention, planning, memory, perception. Generally when we talk about evolution of Intelligence, last Ten years development is basically considered to be studied. Intelligence comprises of Human as well as Artificial intelligence both. In this case, Critical Human Intelligence is concerned with solving problems, reasoning and learning. Furthermore, humans have simple complex behaviours which they can easily learn in their life^[24].

3. Survey Report

Please refer the figure given below.

S.NO.	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Per Capita Income (i.e. PCI)
	What is your Ambition? OR what you want to become in your life?	What is your Father's Occupation and Qualification?	What is your Mother's Occupation and Qualification?	What is your Father's Income?	Family's Income?	Joint Family or Nuclear Family?	Number of dependents in your family?	Number of earning members in family?	Do you live in an Apartment, Society, Housing Colonies or Government Quarter?	Have you ever gone alone, out of city or any adventurous trip?	Do you have home sickness?	Which sports do you like?	Are you Vegetarian, Non-Vegetarian or Eggetarian?	
1	Engineer	Teacher	House Wife	600000	1000000	Joint	5	2	Government Quarter	Yes	No	Football	Non Veg	20000
2	Doctor	Doctor	Doctor	1200000	1200000	Nuclear	3	1	Colony	Yes	No	Cricket	Non Veg	240000
3	Teacher	Teacher	House Wife	700000	1000000	Nuclear	2	2	Colony	Yes	Yes	Basket Ball	Veg	200000
4	Engineer	Politician	Teacher	800000	1600000	Joint	6	3	Government Quarter	Yes	Yes	Ludo	Non Veg	320000
5	Politician	Politician	House Wife	1000000	1500000	Joint	4	2	Government Quarter	No	No	Chess	Non Veg	300000
6	Engineer	Teacher	House Wife	800000	800000	Nuclear	3	1	Colony	Yes	No	Football	Non Veg	160000
7	Engineer	Engineer	House Wife	600000	1000000	Nuclear	3	2	Apartment	No	No	Cricket	Veg	200000
8	Businessman	Businessman	House Wife	1700000	2200000	Joint	5	2	Apartment	No	No	Pubg	Veg	440000
9	Businessman	Businessman	House Wife	2400000	2400000	Nuclear	4	1	Apartment	No	Yes	Chess	Veg	480000
10	Engineer	Engineer	Engineer	300000	500000	Nuclear	3	2	Colony	No	Yes	Badminton	Veg	100000
11	Engineer	Engineer	Teacher	300000	600000	Nuclear	3	2	Colony	No	No	Chess	Veg	120000
12	Engineer	Engineer	House Wife	700000	1600000	Joint	5	3	Apartment	No	Yes	Chess	Veg	320000
13	Teacher	Teacher	House Wife	600000	1700000	Joint	7	3	Colony	No	No	Video	Veg	340000
14	Doctor	Doctor	Doctor	800000	1500000	Joint	4	2	Government Quarter	No	No	Football	Non Veg	300000
15	Doctor	Doctor	House Wife	500000	900000	Joint	5	2	Government Quarter	Yes	No	Football	Non Veg	180000
16	Engineer	Engineer	House Wife	1400000	1800000	Nuclear	3	2	Apartment	Yes	No	Cricket	Veg	360000
17	Teacher	Teacher	House Wife	400000	400000	Nuclear	3	1	Colony	No	No	Ludo	Veg	80000
18	Engineer	Doctor	House Wife	800000	1400000	Joint	5	2	Government Quarter	No	No	Chess	Veg	280000
19	Doctor	Doctor	Engineer	1000000	1500000	Nuclear	3	2	Government Quarter	No	No	Football	Non Veg	300000
20	Doctor	Doctor	House Wife	1200000	1700000	Nuclear	2	2	Government Quarter	No	No	Basket Ball	Non Veg	340000
21	Doctor	Doctor	House Wife	1000000	1400000	Nuclear	4	2	Government Quarter	No	No	Basket Ball	Non Veg	280000
22	Engineer	Engineer	House Wife	700000	700000	Nuclear	3	1	Colony	No	No	Football	Non Veg	140000
23	Teacher	Teacher	House Wife	500000	800000	Nuclear	4	2	Colony	Yes	No	Basket Ball	Non Veg	160000
24	Doctor	Doctor	Doctor	1600000	1600000	Nuclear	3	1	Colony	Yes	Yes	Football	Veg	320000
25	Engineer	Engineer	House Wife	600000	600000	Nuclear	3	1	Apartment	Yes	No	Football	Veg	120000

Figure 2: Detailed Survey Report

After analyzing the detailed Survey Report provided in the above figure 2, we can say there were 13 questions in the survey conducted at ELITE Institute among the students who appeared in +2 final exams. First question of the survey was “What’s your Ambition or what you want to become in your life”.

4. Proposed Algorithm

Here, it should be noted that we are considering points system and using 8 points scale. We assigned 10 points to every questions except the five i.e. Q1, Q4, Q5, Q7 and Q8 which don’t sheant any point. Total point that may be collected is 80. The obtained points per question

may vary from one to another as per the answer given. For instance, In Q2 which ask about the occupation of candidate’s father, 5 options were given (1) Engineer (2) Doctor (3) Teacher (4) Politics (5) Business. If someone choose 1st option i.e. Engineer, he / she would get 7 points, whereas for selection of 2nd option i.e. Doctor, will get 8 points and so on. Finally we will calculate three things which are Per Capita Income (i.e. PCI), Total points collected and Average points collected. To calculate PCI we will use the formula .

$$PCI = \text{Total Familly Income} / \text{Number of Dependent}$$

To calculate the Total Points Collected, just add all the points collected or obtained by answering the question. Finally to calculate the average points collected we will use the formula,

$$\text{Average Points Collected} = \text{Total Points Collected} / 8$$

How to use Web Application

Step 1: Fill the Survey Form. Please refer figure 3

Step 2: Click on Submit Button. Please refer figure 4 and figure 5

Once you click on Submit Button, a message will be displayed “Survey Form Submitted Successfully with Reference #####”. Finally a detailed report will be generated along with answers.

Step 3: Review or Analyze the Report.

Survey Form

1. What is your Ambition? OR what you want to become in your life ?

Engineer Doctor Teacher Politics Business

2. What is your Father's Occupation and Qualification ?

Engineer Doctor Teacher Politics Business

3. What is your Mother's Occupation and Qualification ?

Engineer Politics Business Doctor Teacher House Wife

4. What is your Father's Income ?

160000

5. Family's Income ?

200000

6. Joint Family or Nuclear Family ?

Nuclear Joint

7. Number of dependents in your family ?

5

8. Number of earning members in family ?

2

9. Do you live in an Apartment, Society, Housing Colonies or Government Quarter ?

Housing Colony Government Quarter Apartment Society

10. Have you ever gone alone. out of city or any adventurous trip ?

Yes No

11. Do you have home sickness ?

Yes No

12. Which sports do you like ?

Football Cricket Basket Ball Ludo Chess

13. Are you Vegetarian, Non-Vegetarian or Eggatarian ?

Vegetarian Non-Vegetarian Eggatarian

Figure 3: Survey Form

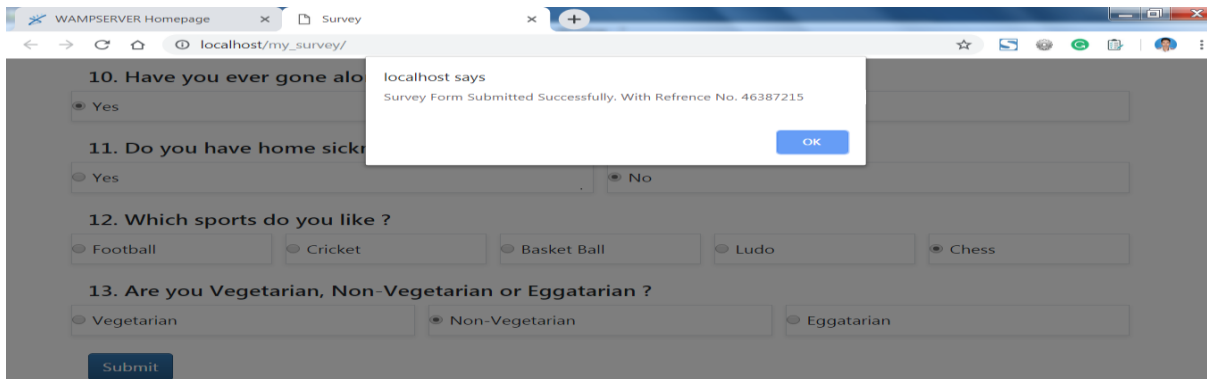


Figure 4: Reference Number Generated

Survey Report

- 1. What is your Ambition? OR what you want to become in your life ?
Chosen Option : Engineer
Points Collected :
 - 2. What is your Father's Occupation and Qualification ?
Chosen Option : Engineer
Points Collected : 7
 - 3. What is your Mother's Occupation and Qualification ?
Chosen Option : Politics
Points Collected : 10
 - 4. What is your Father's Income ?
Chosen Option : 160000
Points Collected :
 - 5. Family's Income ?
Chosen Option : 200000
Points Collected :
 - 6. Joint Family or Nuclear Family ?
Chosen Option : Joint
Points Collected : 10
 - 7. Number of dependents in your family ?
Chosen Option : 5
Points Collected :
 - 8. Number of earning members in family ?
Chosen Option : 2
Points Collected :
 - 9. Do you live in an Apartment, Society, Housing Colonies or Government Quarter ?
Chosen Option : Government Quarter
Points Collected : 8
 - 10. Have you ever gone alone. out of city or any adventurous trip ?
Chosen Option : Yes
Points Collected : 10
 - 11. Do you have home sickness ?
Chosen Option : No
Points Collected : 10
 - 12. Which sports do you like ?
Chosen Option : Chess
Points Collected : 10
 - 13. Are you Vegetarian, Non-Vegetarian or Eggatarian ?
Chosen Option : Non-Vegetarian
Points Collected : 9
- Per capital Income : **Rs. 28571.43**
 Total Point Collected : **74**
 Maximum Point : **80**
 Average Points Collected : **9.25**

Figure 5: Survey Report

5. PHP Code

Following is the PHP Code of Survey Form and Report Generation Page. Please refer figure 6 for the PHP Code of Survey Form and figure 7 for the PHP Code of Report Generation Page.

```

<?phpdefined('BASEPATH') OR exit('No direct script access allowed');class Survey extends CI_Controller {
    /**
     * Index Page for this controller.
     * Maps to the following URL
     * http://example.com/index.php/welcome
     * - or -
     * http://example.com/index.php/welcome/index
     * So any other public methods not prefixed with an underscore will
     * map to /index.php/welcome/<method_name>
     * @see https://codeigniter.com/user_guide/general/urls.html
     */
    public function index()
    {
        $this->load->model("question_model");
        $sdata["question"] = $this->question_model->get_question_list();
        $sdata["answer"] = $this->question_model->get_answer_list();
        $this->load->view('survey_form', $sdata);
        public function submit()
        {
            $this->load->helper('string');
            $subm_id = random_string('nozero', 8);
            foreach($S_POST as $key => $value) { // echo "POST parameter '$key' has '$value'";
                $sdata_d=array( 'submission_id'=>$subm_id, 'question_id'=>$key, 'answer_id'=>$value );
                if($this->db->insert('data_submitted',$sdata_d){ // return true; }
                echo "Survey Form Submitted Successfully. With Refrence No. ". $subm_id;
            }
        }
    }
}
    
```

Figure 6: PHP Code for Survey Form

```

<?phpdefined('BASEPATH') OR exit('No direct script access allowed');class Generate_report extends CI_Controller {
    /**
     * Index Page for this controller.
     * Maps to the following URL
     * http://example.com/index.php/welcome
     * - or -
     * http://example.com/index.php/welcome/index
     * So any other public methods not prefixed with an underscore will
     * map to /index.php/welcome/<method_name>
     * @see https://codeigniter.com/user_guide/general/urls.html
     */
    public function index()
    {
        $subm_id=$ref;
        $this->db->select('svy.submission_id as sub_id,svy.time as sub_time,q.id as q_id,q.question,q.input_type as q_op_type,svy.answer_id as ans_id,ans.answer as ans,ans.point as point_collected')->from('data_submitted svy')->join('answer ans','ans.id = svy.answer_id','left')->where('svy.submission_id',$subm_id);
        $query = $this->db->get();
        //echo "<pre>";
        //print_r($query->result_array());
        $count=0;
        foreach($query->result() as $sdata)
        {
            $count++;
            if($sdata->q_id=='1' OR $sdata->q_id=='4'){
                $sdata->point_collected="";
                $family_income=$sdata->ans;
                $family_member=$sdata->ans;
                $sdata->point_collected="";
            }
            elseif($sdata->q_id=='5'){
                $family_member=$sdata->ans;
                $sdata->point_collected="";
            }
            elseif($sdata->q_id=='7'){
                $family_member+=$sdata->ans;
                $total_point=;
            }
            elseif($sdata->q_id=='8'){
                $spci=$family_income/$family_member;
                echo $count." ". $sdata->question."<br>Chooosen Option : ". $sdata->ans."<br>Points Collected : ". $sdata->point_collected."<br><br>";
                if($spci<=100000){
                    $total_point+=5;
                }
                elseif($spci>100000 & $spci<=200000){
                    $total_point+=7;
                }
                elseif($spci>200000 & $spci<=400000){
                    $total_point+=9;
                }
                else{
                    $total_point+=10;
                }
                $smax_point=80;
                $saverage=$total_point/8;
                echo "<br><br>Per capital Income : <b>Rs. ".number_format($spci, 2, ',', '')."<b>";
                echo "<br>Total Point Collected : <b>". $total_point."<b>";
                echo "<br>Maximum Point : <b>";
                $smax_point."<b>";
                echo "<br>Average Points Collected : <b>".number_format($saverage, 2, ',', '')."<b>";
            }
        }
    }
}
    
```

Figure 7: PHP Code for Report Generation Page

Pseudo code

Pseudo code to Display and Save Survey Form

```
CLASS Survey
    index()
    {
        // Fetch All the Questions From Database
        Connect to database named 'survey'.
        GET all the question, point and answer form table 'question'
            IF number of output Result (table row count) is grater then 0
                Show Each Questions and it's related answers
                Show a 'submit' button to submit the form and collect POINTS
            ELSE
                Display '0 records found
    '
        IF user click 'submit' button then
            Call method 'submit()'
    }

    submit()
    {
        FOREACH Question
            GET Question ID
            GET Answer ID
            GET Collected POINT
            PUT these data into an arry

        Connect to Database named 'survey'
        CREATE a random non-zero eight digit String
        Save these data into Database with the help of array

        IF INSERTED then
            Display 'Survey Form Submitted Successfully with Refrence Number.
(Generated String)'
        ELSE
            Display 'Some Error Occured'

    }
}
```

6. Conclusion

With the help of this Algorithm SR Z v1.0 we can predict the student’s field of interest with around 90% accuracy. From the survey report generation, it should be noted that more the “Total Points Collected” out of Total marks i.e. 80, more will be the possibility to select the same profession as of his / her father. Please refer figure 8 as given below. After 4 years from the first Survey i.e. in 2015 we have done a new Survey on the same candidates who actively participated in the last Survey and checked whether they achieved their goal or not. As a result of the Survey, we found that 90% of the students have achieved their goals in their life. In this way, we achieved our Research Goal.

Sl. No.	Name of the Student	Wanted to be a :	Achieved (Y/N)
1	Rakesh Kumar	Engineer	Y
2	Sakshi Rao	Engineer	Y
3	Priyanka Jaiswal	Engineer	Y
4	Simon Marandi	Doctor	N
5	Shikha Tripathi	Teacher	Y
6	Swati Dutta	Engineer	Y
7	Sameer Sharma	Politician	Y
8	Asif Iqbal	Engineer	Y
9	Saryadeo Kumar	Engineer	Y
10	Sanjana Sharma	Businessman	Y
11	Samar Ansh	Businessman	Y
12	Sarita Jais	Engineer	Y
13	Manisha Kumari	Engineer	Y
14	Abhay Kumar Thakur	Engineer	Y
15	Ravi Mehta	Teacher	Y
16	Alka Suman	Doctor	Y
17	Neha Chandrakar	Doctor	Y
18	Zeha Khan	Engineer	N
19	Ashraf Mahfooz	Teacher	Y
20	Sumit Sharma	Engineer	Y
21	Shankar Kumar	Doctor	Y
22	Shalini Singh Rajput	Doctor	Y
23	Riddhi Vishwakarma	Doctor	Y
24	Naina Sharma	Engineer	Y
25	Vishal Raj	Teacher	Y

Figure 8: Conclusion Table

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