**ZOOLOGICAL GARDEN**

**CSE2004 Database Management System**

**Project Report**

**Submitted by**

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*Tejasri B N 19BAI1032*

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**School of Computer Science and Engineering**

**April 2020**

**Table of Content**

Page Number

Project Details - 3

E-R Diagram - 4

E-R to Relational model - 5

Normalized Table - 11

**Project Details**

**Introduction**

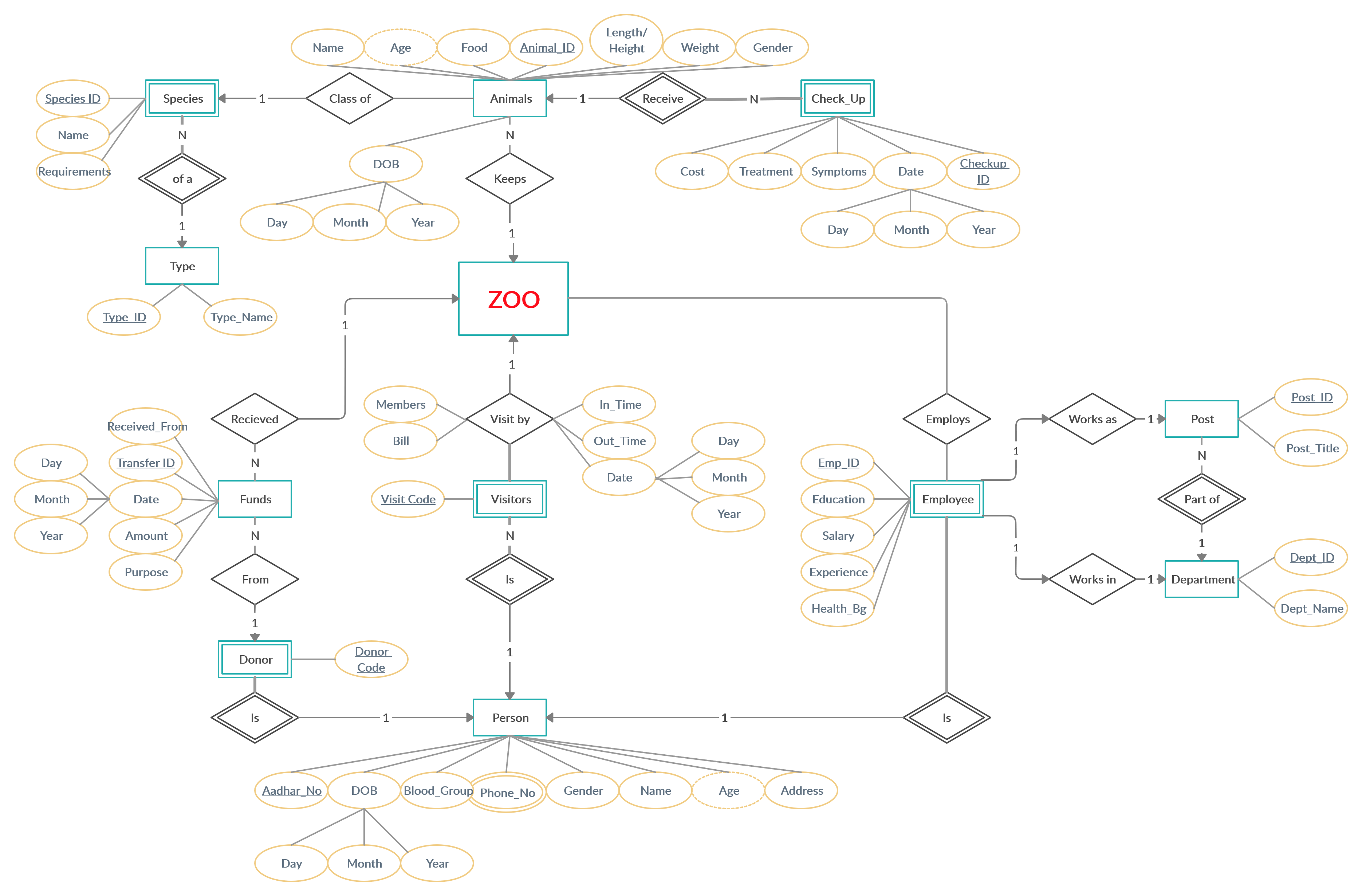
The following project is a large, detailed and sophisticated demonstration of the kind of database one may find being used at zoos around the world. It has been designed as a method of keeping track of various information, including (but not limited to) the kinds of animals safeguarded at the zoo, complete details of all people employed at the zoo, the kind of funding on which the zoo operates, etc.

The development of this project began on the 4th of January, with the creation of a relevant ER diagram, to help understand the information to be stored, and the relationships between all this information. We have since been refining the ER diagram to better represent the structure of the required database, and improve on its data handling abilities.

Following this, we were able to formulate a Relational Model of the ER diagram, and systematically fill data in each table, in each and every row/column that was necessary. It was done with the purpose of determining and finalizing the relationships between each table. It also made it possible to superimpose a logical structure upon the data on the basis of these relationships. This further improved our understanding of the scale of the project. It also greatly helped us appreciate the amount of effort put into database maintenance by database managers over the world.

Finally, upon introducing data into the tables, we were able to apply the rules of Normalization in order to reduce data redundancy, as well as improve data integrity. This streamlined the data retrieval process, and will lead to a significantly more professional database. Upon normalization, the database will take less time to retrieve data, will be lag friendly, and help provide a more friendly user-interface. The normalized database is free of all insertion, update and delete anomalies, which is an extremely desirable feature, especially for large-scale databases such as this. It also prevents all forms of data duplication, which saves valuable space on servers, permitting the storage of more unique and important data.

All information made available by the user is stored on a database making use of Oracle SQL, and is presented by making use of a front-end application developed on PHP, which is a general-purpose scripting language. PHP is often embedded in HTML for ease of use. PHP can also be used for website development, in conjunction with HTML.



**E-R to Relational Model**

**Visit By (Relation)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Visit\_Code | Date | | | In\_Time | Out\_Time | Members | Bill |
| Day | Month | Year |
| v1101 | 26 | January | 2011 | 10:30 AM | 1:15 PM | 4 | 400 |
| v1302 | 4 | June | 2013 | 4:15 PM | 6:45 PM | 3 | 300 |
| v1485 | 30 | September | 2014 | 2:45 PM | 5:45 PM | 2 | 200 |
| v1832 | 27 | March | 2018 | 11:15 AM | 1:45 PM | 3 | 300 |
| v1835 | 29 | February | 2018 | 3:00 PM | 6:30 PM | 2 | 200 |

**Visitors (Weak Entity)**

|  |  |
| --- | --- |
| Visit\_Code | Aadhar\_No |
| v1101 | 1402 5823 9583 |
| v1302 | 6820 5792 5913 |
| v1485 | 5013 2597 5397 |
| v1832 | 5023 2447 5823 |
| v1835 | 1503 5792 2579 |

**Employee (Weak Entity)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Emp\_ID | Aadhar\_No | Salary | Post\_Name | Dept\_Name | Education | Experience | Health\_Bg |
| emp1040 | 1953 4250 2579 | 100000 | p7 | d4 | IGCSE 10th | 5 years | healthy |
| emp5103 | 2084 5792 1024 | 175923 | p2 | d1 | B.Sc. biology | 1 year | mild asthma |
| emp3508 | 5082 5120 1280 | 123975 | p15 | d7 | CBSE +2 | 7 years | healthy |
| emp2513 | 0648 5380 8625 | 142573 | p3 | d2 | MBBS | 10 years | limp |
| emp6084 | 6083 3580 1248 | 198275 | p1 | d1 | PhD biology | 12 years | healthy |

**Department (Entity)**

|  |  |
| --- | --- |
| Dept\_ID | Dept name |
| D1 | Reseach |
| D2 | Doctor |
| D3 | Plant caretaking |
| D4 | Worker |
| D5 | Volunteer |
| D6 | Finance and Accounts |
| D7 | Animal Caretaker |
| D8 | Tours and Giftshop |
| D9 | Management |

**Person (Entity)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Aadhar\_No | Name | DOB | | | Age | Gender | Address | Phone\_No |  | Blood\_group |
| Day | Month | Year |  |
| 1402 5823 9583 | Karan | 12 | December | 1993 | 27yrs | M | 12/6 Raja colony | 8610036563 |  | AB+ |
| 6820 5792 5913 | Kartik | 14 | September | 1997 | 23yrs | M | 42/7 Rani colony | 9952470839  9445577864 |  | A- |
| 5013 2597 5397 | Vishnu | 28 | January | 1980 | 40yrs | M | 2/5 MRC nagar | 1523058023 |  | B+ |
| 5023 2447 5823 | Ananya | 29 | March | 1983 | 37yrs | F | 4/23 Chithappa colony | 5813095835 |  | O- |
| 1503 5792 2579 | Shreekriti | 17 | April | 1989 | 31yrs | F | 6/24 Saidapet | 4185929385  8438885878 |  | O+ |
| 1953 4250 2579 | Leslie | 31 | March | 2000 | 20yrs | M | 34/42 Gandhi Nagar | 9734927493 |  | AB- |
| 2084 5792 1024 | Janice | 7 | May | 1994 | 26yrs | F | 1/35 Adyar | 5720139573  9790750262 |  | B+ |
| 5082 5120 1280 | Joy | 31 | July | 1996 | 24yrs | F | 20/26 Sastri nagar | 9248419482  9790750333 |  | A+ |
| 0648 5380 8625 | Arvind | 12 | August | 1980 | 40yrs | M | #656 Shangi | 7482974408 |  | O+ |
| 6083 3580 1248 | Salman | 23 | October | 1978 | 42yrs | M | 14/8 Nandanam | 7440892841 |  | B+ |
| 6220 5492 5513 | Teena | 32 | January | 1973 | 47yrs | F | 23/5 Raja colony | 2395813925 |  | A- |
| 1013 2567 2397 | John | 26 | January | 2011 | 9yrs | M | 5/23 MRC nagar | 6982875918  9962324098 |  | AB- |
| 5123 2547 5223 | Sunny | 4 | June | 2013 | 7yrs | F | 6/45 Saidapet | 5692442025 |  | AB+ |
| 1506 2792 2570 | Jill | 30 | September | 2014 | 6yrs | F | 1/5 Adyar | 5928517492 |  | B- |
| 1954 4251 2529 | Noella | 27 | March | 2018 | 2yrs | F | 5/63 Sastri nagar | 6917493762 |  | B+ |

**Post (Entity)**

|  |  |  |
| --- | --- | --- |
| Post\_ID | Post title | Dept\_ID |
| p1 | Scientist | d1 |
| p2 | Apprentice | d1 |
| p3 | Physician | d2 |
| p4 | Floriculturist | d3 |
| p5 | Conservation Biologist | d3 |
| p6 | Horticulturist | d3 |
| p7 | Worker | d4 |
| p8 | Volunteer | d5 |
| p9 | Finance Manager | d6 |
| p10 | Accountant | d6 |
| p11 | Veterinarian | d7 |
| p12 | Veterinary Technician | d7 |
| p13 | Head Keeper | d7 |
| p14 | Senior Keeper | d7 |
| p15 | Zoo Keeper | d7 |
| p16 | Zoologist | d7 |
| p17 | Tour Guide | d8 |
| p18 | Clerk | d8 |
| p19 | Manager | d9 |
| p20 | Curator | d9 |
| p21 | Director | d9 |
| p22 | Coordinator | d9 |
| p23 | Registrar | d9 |

**Species ( Weak Entity)**

|  |  |  |  |
| --- | --- | --- | --- |
| Specie\_ID | Type\_ID | Name | Requirements |
| sp201 | at1 | Aligator | Pond |
| sp202 | at1 | Boa-constrictor | Logs |
| sp101 | at2 | Cassowary | climbing structures |
| sp103 | at3 | Cheetah | Trees |
| sp305 | at3 | Echidna | hollow logs, rock crevices and hay |

**Types (Entity)**

|  |  |
| --- | --- |
| Type\_ID | Type-name |
| at1 | Reptiles |
| at2 | Birds |
| at3 | mammals |

**Check-up (Entity)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Checkup\_ID | Animal\_ID | Date | | | Symptoms | Treatment | Cost |
| Day | Month | Year |
| chk203 | an2012 | 12 | December | 2019 | Pregnant | C-Section | 10000000 |
| chk394 | an1099 | 14 | September | 2019 | broken femur | Cast | 7500 |
| chk890 | an1031 | 28 | January | 2020 | Stomach Infection | Antibiotics | 6500 |
| chk690 | an3035 | 25 | March | 2020 | Cataract | minor surgery | 9000 |
| chk523 | an1034 | 17 | April | 2019 | regular check up | none | 200 |

**Animals (Entity)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Animal\_ID | Species\_ID | Name | DOB | | | Length/Height | Weight | Age | Gender | Food |
| Day | Month | Year |
| an2012 | sp201 | Rai |  |  |  | 6ft | 350kg | 12yrs | F | Meat |
| an2022 | sp201 | Raj | 3 | 4 | 2002 | 5.8ft | 369.8kg | 18yrs | M | Meat |
| an1011 | sp202 | Shay | 17 | 3 | 2016 | 7ft | 3kg | 4yrs | F | Meat |
| an1031 | sp101 | Likr | 5 | 11 | 2015 |  | 40.8kg | 5yrs | M | Fruits and Vegetable |
| an3053 | sp101 | Simba | 6 | 6 | 2015 |  | 52.3kg | 5yrs | M | Fruits and Vegetable |
| an2010 | sp101 | Cindy |  |  |  |  | 39.9kg | 3yrs | F | Fruits and Vegetable |
| an2000 | sp101 | Tom | 6 | 9 | 2020 |  | 48kg | 3 months | M | Fruits and Vegetable |
| an1099 | sp103 | Sheela |  |  |  | 7ft | 69kg | 8yrs | F | Meat |
| an1034 | sp103 | Maki | 31 | 12 | 2006 | 8ft | 67.8kg | 14yrs | F | Meat |
| an3035 | sp305 | Lina | 9 | 8 | 2018 |  | 4.5kg | 2yrs | F | Fruits and Vegetable |
| an2029 | sp305 | Harry | 29 | 10 | 2019 |  | 3.9kg | 1yr | M | Fruits and Vegetable |
| an2091 | sp305 | Potah | 29 | 10 | 2019 |  | 4kg | 1yr | M | Fruits and Vegetable |
| an1009 | sp305 | Draco |  |  |  |  | 3.9kg | 3yrs | M | Fruits and Vegetable |
| an1037 | sp305 | Malf | 25 | 3 | 2018 |  | 4.7kg | 2yrs | M | Fruits and Vegetable |

**Donor (Weak Entity)**

|  |  |
| --- | --- |
| Donor\_ID | Aadhar\_No |
| d1001 | 6220 5492 5513 |
| d1002 | 1013 2567 2397 |
| d1003 | 5123 2547 5223 |
| d1001 | 1506 2792 2570 |
| d1010 | 1954 4251 2529 |

**Funds (Entity)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Transfer\_ID | Donor\_ID | Date | | | Amount | Purpose |
| Day | Month | Year |
| f001 |  | 3 | 3 | 2003 | 200000 | Breeding |
| f002 | d1001 | 2 | 4 | 2015 | 30,000 | Orangutan developement |
| f003 |  | 15 | 7 | 2019 | 5,000 | Food |
| f004 | d1002 | 31 | 12 | 2017 | 69,999 | Food |
| f005 | d1003 | 25 | 1 | 2020 | 400000 | Facilities |
| f006 |  | 9 | 9 | 2018 | 5001 | Developement |
| f007 | d1001 | 17 | 9 | 2014 | 10000001 | Advertisement |
| f008 |  | 28 | 2 | 2017 | 10384 | bird cages |
| f009 |  | 6 | 1 | 2019 | 120934 | Conservation |
| f010 | d1010 | 16 | 6 | 2018 | 33424254 | alligator enclosure |

**Normalisation**

**Visit\_By**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Visit\_Code | Date | | | In\_Time | Out\_Time | Members | Bill |
| Day | Month | Year |
| v1101 | 26 | January | 2011 | 10:30 AM | 1:15 PM | 4 | 400 |
| v1302 | 4 | June | 2013 | 4:15 PM | 6:45 PM | 3 | 300 |
| v1485 | 30 | September | 2014 | 2:45 PM | 5:45 PM | 2 | 200 |
| v1832 | 27 | March | 2018 | 11:15 AM | 1:45 PM | 3 | 300 |
| v1835 | 29 | February | 2018 | 3:00 PM | 6:30 PM | 2 | 200 |

**Visitor**

|  |  |
| --- | --- |
| Visit\_Code | Aadhar\_No |
| v1101 | 1402 5823 9583 |
| v1302 | 6820 5792 5913 |
| v1485 | 5013 2597 5397 |
| v1832 | 5023 2447 5823 |
| v1835 | 1503 5792 2579 |

**Employee**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Emp\_ID | Aadhar\_No | Post\_ID | Education | Experience | Health\_Bg |
| emp1040 | 1953 4250 2579 | p7 | IGCSE 10th | 5 years | healthy |
| emp5103 | 2084 5792 1024 | p1 | B.Sc. biology | 1 year | mild asthma |
| emp3508 | 5082 5120 1280 | p15 | CBSE +2 | 7 years | healthy |
| emp2513 | 0648 5380 8625 | p3 | MBBS | 10 years | limp |
| emp6084 | 6083 3580 1248 | p1 | PhD biology | 12 years | healthy |

**Salary**

|  |  |
| --- | --- |
| Post\_ID | Salary |
| p7 | 100000 |
| p1 | 200000 |
| p15 | 123975 |
| p3 | 142573 |

**Person**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Aadhar\_No | Name | DOB | | | Age | Gender | Address | Phone\_No | Blood\_group |
| Day | Month | Year |
| 1402 5823 9583 | Karan | 12 | December | 1993 | 27yrs | M | 12/6 Raja colony | 8610036563 | AB+ |
| 6820 5792 5913 | Kartik | 14 | September | 1997 | 23yrs | M | 42/7 Rani colony | 9952470839 | A- |
| 6820 5792 5913 | Kartik | 14 | September | 1997 | 23yrs | M | 42/7 Rani colony | 9445577864 | A- |
| 5013 2597 5397 | Vishnu | 28 | January | 1980 | 40yrs | M | 2/5 MRC nagar | 1523058023 | B+ |
| 5023 2447 5823 | Ananya | 29 | March | 1983 | 37yrs | F | 4/23 Chithappa colony | 5813095835 | O- |
| 1503 5792 2579 | Shreekriti | 17 | April | 1989 | 31yrs | F | 6/24 Saidapet | 4185929385 | O+ |
| 1503 5792 2579 | Shreekriti | 17 | April | 1989 | 31yrs | F | 6/24 Saidapet | 8438885878 | O+ |
| 1953 4250 2579 | Leslie | 31 | March | 2000 | 20yrs | M | 34/42 Gandhi Nagar | 9734927493 | AB- |
| 2084 5792 1024 | Janice | 7 | May | 1994 | 26yrs | F | 1/35 Adyar | 5720139573 | B+ |
| 2084 5792 1024 | Janice | 7 | May | 1994 | 26yrs | F | 1/35 Adyar | 9790750262 | B+ |
| 5082 5120 1280 | Joy | 31 | July | 1996 | 24yrs | F | 20/26 Sastri nagar | 9248419482 | A+ |
| 5082 5120 1280 | Joy | 31 | July | 1996 | 24yrs | F | 20/26 Sastri nagar | 9790750333 | A+ |
| 0648 5380 8625 | Arvind | 12 | August | 1980 | 40yrs | M | #656 Shangi | 7482974408 | O+ |
| 6083 3580 1248 | Salman | 23 | October | 1978 | 42yrs | M | 14/8 Nandanam | 7440892841 | B+ |
| 6220 5492 5513 | Teena | 32 | January | 1973 | 47yrs | F | 23/5 Raja colony | 2395813925 | A- |
| 1013 2567 2397 | John | 26 | January | 2011 | 9yrs | M | 5/23 MRC nagar | 9962324098 | AB- |
| 1013 2567 2397 | John | 26 | January | 2011 | 9yrs | M | 5/23 MRC nagar | 6982875918 | AB- |
| 5123 2547 5223 | Sunny | 4 | June | 2013 | 7yrs | F | 6/45 Saidapet | 5692442025 | AB+ |
| 1506 2792 2570 | Jill | 30 | September | 2014 | 6yrs | F | 1/5 Adyar | 5928517492 | B- |
| 1954 4251 2529 | Noella | 27 | March | 2018 | 2yrs | F | 5/63 Sastri nagar | 6917493762 | B+ |

**Post**

|  |  |
| --- | --- |
| Post\_ID | Post title |
| p1 | Scientist |
| p2 | Apprentice |
| p3 | Physician |
| p4 | Floriculturist |
| p5 | Conservation Biologist |
| p6 | Horticulturist |
| p7 | Worker |
| p8 | Volunteer |
| p9 | Finance Manager |
| p10 | Accountant |
| p11 | Veterinarian |
| p12 | Veterinary Technician |
| p13 | Head Keeper |
| p14 | Senior Keeper |
| p15 | Zoo Keeper |
| p16 | Zoologist |
| p17 | Tour Guide |
| p18 | Clerk |
| p19 | Manager |
| p20 | Curator |
| p21 | Director |
| p22 | Coordinator |
| p23 | Registrar |

**Post\_Dept**

|  |  |
| --- | --- |
| Post\_ID | Dept\_ID |
| p1 | d1 |
| p2 | d1 |
| p3 | d2 |
| p4 | d3 |
| p5 | d3 |
| p6 | d3 |
| p7 | d4 |
| p8 | d5 |
| p9 | d6 |
| p10 | d6 |
| p11 | d7 |
| p12 | d7 |
| p13 | d7 |
| p14 | d7 |
| p15 | d7 |
| p16 | d7 |
| p17 | d8 |
| p18 | d8 |
| p19 | d9 |
| p20 | d9 |
| p21 | d9 |
| p22 | d9 |
| p23 | d9 |

**Department**

|  |  |
| --- | --- |
| Dept\_ID | Dept name |
| D1 | Reseach |
| D2 | Doctor |
| D3 | Plant caretaking |
| D4 | Worker |
| D5 | Volunteer |
| D6 | Finance and Accounts |
| D7 | Animal Caretaker |
| D8 | Tours and Giftshop |
| D9 | Management |

**Species**

|  |  |  |  |
| --- | --- | --- | --- |
| Specie\_ID | Name | Food | Requirements |
| sp201 | Aligator | Meat | Pond |
| sp202 | Boa-constrictor | Meat | Logs |
| sp101 | Cassowary | Fruits and Vegetables | climbing structures |
| sp103 | Cheetah | Meat | Trees |
| sp305 | Echidna | Fruits and Vegetables | hollow logs, rock crevices and hay |

**Specie\_Type**

|  |  |
| --- | --- |
| Specie\_ID | Type\_ID |
| sp201 | at1 |
| sp202 | at1 |
| sp101 | at2 |
| sp103 | at3 |
| sp305 | at3 |

**Type**

|  |  |
| --- | --- |
| Type\_ID | Type\_name |
| at1 | Reptiles |
| at2 | Birds |
| at3 | mammals |

**Checkup\_Animal**

|  |  |
| --- | --- |
| Checkup\_ID | Animal\_ID |
|
| chk203 | an2012 |
| chk394 | an1099 |
| chk890 | an1031 |
| chk690 | an3035 |
| chk523 | an1034 |

**Animal\_Species**

|  |  |
| --- | --- |
| Animal\_ID | Species\_ID |
|
| an2012 | sp201 |
| an2022 | sp201 |
| an1011 | sp202 |
| an1031 | sp101 |
| an3053 | sp101 |
| an2010 | sp101 |
| an2000 | sp101 |
| an1099 | sp103 |
| an1034 | sp103 |
| an3035 | sp305 |
| an2029 | sp305 |
| an2091 | sp305 |
| an1009 | sp305 |
| an1037 | sp305 |

**Animal**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Animal\_ID | Name | DOB | | | Length/Height | Weight | Age | Gender |
| Day | Month | Year |
| an2012 | Rai |  |  |  | 6ft | 350kg | 12yrs | F |
| an2022 | Raj | 3 | 4 | 2002 | 5.8ft | 369.8kg | 18yrs | M |
| an1011 | Shay | 17 | 3 | 2016 | 7ft | 3kg | 4yrs | F |
| an1031 | Likr | 5 | 11 | 2015 | 5ft | 40.8kg | 5yrs | M |
| an3053 | Simba | 6 | 6 | 2015 | 8ft | 52.3kg | 5yrs | M |
| an2010 | Cindy |  |  |  | 4ft | 39.9kg | 3yrs | F |
| an2000 | Tom | 6 | 9 | 2020 | 3ft | 48kg | 3 months | M |
| an1099 | Sheela |  |  |  | 7ft | 69kg | 8yrs | F |
| an1034 | Maki | 31 | 12 | 2006 | 8ft | 67.8kg | 14yrs | F |
| an3035 | Lina | 9 | 8 | 2018 | 3.7ft | 4.5kg | 2yrs | F |
| an2029 | Harry | 29 | 10 | 2019 | 4ft | 3.9kg | 1yr | M |
| an2091 | Potah | 29 | 10 | 2019 | 1.9ft | 4kg | 1yr | M |
| an1009 | Draco |  |  |  | 2.4ft | 3.9kg | 3yrs | M |
| an1037 | Malf | 25 | 3 | 2018 | 2ft | 4.7kg | 2yrs | M |

**Check\_up**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Checkup\_ID | Date | | | Symptoms | Treatment | Cost |
| Day | Month | Year |
| chk203 | 12 | December | 2019 | Pregnant | C-Section | 10000000 |
| chk394 | 14 | September | 2019 | broken femur | Cast | 7500 |
| chk890 | 28 | January | 2020 | Stomach Infection | Antibiotics | 6500 |
| chk690 | 25 | March | 2020 | Cataract | minor surgery | 9000 |
| chk523 | 17 | April | 2019 | regular check up | none | 200 |

**Donor**

|  |  |
| --- | --- |
| Donor Code | Aadhar\_No |
| d1001 | 6220 5492 5513 |
| d1002 | 1013 2567 2397 |
| d1003 | 5123 2547 5223 |
| d1001 | 1506 2792 2570 |
| d1010 | 1954 4251 2529 |

**Funds**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Transfer\_ID | Date | | | Amount | Purpose |
| Day | Month | Year |
| f001 | 3 | 3 | 2003 | 200000 | Breeding |
| f002 | 2 | 4 | 2015 | 30,000 | Orangutan developement |
| f003 | 15 | 7 | 2019 | 5,000 | Food |
| f004 | 31 | 12 | 2017 | 69,999 | Food |
| f005 | 25 | 1 | 2020 | 400000 | Facilities |
| f006 | 9 | 9 | 2018 | 5001 | Developement |
| f007 | 17 | 9 | 2014 | 10000001 | Advertisement |
| f008 | 28 | 2 | 2017 | 10384 | bird cages |
| f009 | 6 | 1 | 2019 | 120934 | Conservation |
| f010 | 16 | 6 | 2018 | 33424254 | alligator enclosure |

**Donor\_Transfer**

|  |  |
| --- | --- |
| Transfer\_ID | Donor\_ID |
|
| f001 |  |
| f002 | d1001 |
| f003 |  |
| f004 | d1002 |
| f005 | d1003 |
| f006 |  |
| f007 | d1001 |
| f008 |  |
| f009 |  |
| f010 | d1010 |