

# Programming Projects

1. Ans:

```
# include <stdio.h>
# define RATE 0.35

int main()
{
    double beg_reading, end_reading, distance, reimbursement;
    printf("MILEAGE REIMBURSEMENT CALCULATOR\n");
    printf("Enter beginning odometer reading=> ");
    scanf("%lf",&beg_reading);
    printf("Enter ending odometer reading=> ");
    scanf("%lf",&end_reading);
    distance = end_reading - beg_reading;
    reimbursement = distance * RATE;
    printf("You traveled %.1f miles. At $%.2f per mile, \nyour reimbursement is $%.2f.",distance, RATE,
reimbursement);
    return 0;
}
```

2. Ans:

```
# include <stdio.h>
# define GRAVITATIONAL_CONSTANT 9.80
# define EFFICIENCY 0.90
# define PER_CUBIC_MASS 1000

int main()
{
    int height;
    double work, mass, water_flow_each_second, energy, power;
    printf("DAM POWER CALCULATOR\n");
    printf("Enter height of the dam=> ");
    scanf("%d",&height);
    printf("Enter flow of the dam=> ");
    scanf("%lf",&water_flow_each_second);
    mass = water_flow_each_second * PER_CUBIC_MASS;
    work = mass * GRAVITATIONAL_CONSTANT * height;
    energy = work * EFFICIENCY;
    power = energy / 1000000;
    printf("The dam produces %.2f megawatts of power each second.",power);
    return 0;
}
```

3. Ans:

```
# include <stdio.h>

int main()
{
    int hours, minutes;
    double time_elapsed, temp;
    printf("REFRIGERATOR TEMPERATOR CALCULATOR\n");
    printf("Enter elapsed time (in hours and minutes separated by a space) since a power failure=> ");
```

```

scanf("%d %d",&hours, &minutes);
time_elapsed = (hours * 60 + minutes)/60.0;
temp = ((4*time_elapsed*time_elapsed)/(time_elapsed+2)) - 20;
printf("The estimated temperature of refrigerator is %.2f degree celsius after %.2f hours of power
failure.", temp, time_elapsed);
return 0;
}

```

4. Ans:

```
# include <stdio.h>
```

```

int main()
{
    int fahrenheit; /* temperature in degrees Fahrenheit */
    double celsius; /* temperature in degrees Celsius */
    printf("FAHRENHEIT TO DEGREE CELSIUS CONVERTOR\n");
    printf("Enter temperature in Fahrenheit scale=> ");
    scanf("%d",&fahrenheit);
    celsius = (5/9.0)*(fahrenheit-32);
    printf("%d Fahrenheit is equivalent to %.2f degree celsius.", fahrenheit, celsius);
    return 0;
}

```

5. Ans:

```
# include <stdio.h>
```

```

int main()
{
    int volume, minutes, rate;
    printf("HOSPITAL MEDICATION DELIVER CALCULATOR\n");
    printf("Volume to be infused (ml) => ");
    scanf("%d",&volume);
    printf("Minutes over which to infuse => ");
    scanf("%d",&minutes);
    rate = (60.0/minutes)*volume;
    printf("VTBI: %d ml \nRate: %d ml/hr", volume, rate);
    return 0;
}

```

6. Ans:

```
# include <stdio.h>
```

```

int main()
{
    char grade;
    int final_percent;
    double min_avg, cur_avg, difference, score_req;
    printf("FINAL SCORE PREDICTOR TO GET A GRADE\n");
    printf("Enter desired grade> ");
    scanf("%c",&grade);
    printf("Enter minimum average required> ");
    scanf("%lf",&min_avg);
    printf("Enter current average in course> ");
}

```

```

scanf("%lf",&cur_avg);
printf("Enter how much the final counts \nas a percentage of the course grade> ");
scanf("%d",&final_percent);
difference = min_avg - cur_avg*(100 - final_percent)/100;
score_req = difference*100/final_percent;
printf("You need a score of %.2f in the final exam to get a grade %c.", score_req, grade);
return 0;
}

```

7. Ans:

```
# include <stdio.h>
```

```

int main()
{
    int num_gallons, efficiency;
    double heat, energy_per_gallon;
    printf("BTU OF HEAT DELIVERED\n");
    printf("Enter the efficiency> ");
    scanf("%d",&efficiency);
    printf("Enter the number of gallons> ");
    scanf("%d",&num_gallons);
    energy_per_gallon = 5800000.0/42;
    heat = num_gallons * (efficiency/100.0) * energy_per_gallon;
    printf("%.2f BTUs of heat is delivered by burning %d gallons of oil with %d percent efficiency.", heat,
num_gallons, efficiency);
    return 0;
}

```

8. Ans:

```
# include <stdio.h>
```

```
# define COST_PER_TOILET 150
```

```
# define NEW_TOILET_PER_FLUSH 2
```

```
# define OLD_TOILET_PER_FLUSH 15
```

```
# define AVG_FLUSH_NUMBER 14
```

```

int main()
{
    int population, num_toilets, water_cost;
    double water_required_old, water_required_new, water_saved, cost_saved;
    printf("ESTIMATION OF MAGNITUDE (LITERS/DAY) AND COST OF THE WATER SAVED\n");
    printf("Enter the community's population> ");
    scanf("%d",&population);
    printf("Enter per liter cost of water> ");
    scanf("%d",&water_cost);
    num_toilets = (population+2)/3;
    water_required_old = num_toilets*OLD_TOILET_PER_FLUSH*AVG_FLUSH_NUMBER;
    water_required_new = num_toilets*NEW_TOILET_PER_FLUSH*AVG_FLUSH_NUMBER;
    water_saved = water_required_old - water_required_new;
    cost_saved = water_saved*water_cost - num_toilets*150;
    printf("Installing new toilets will save water of magnitude %.2f liters/day and %.2f dollars cost is
saved.", water_saved, cost_saved);
    return 0;
}

```

9. Ans:

```
#include <stdio.h>
#define RATE 2

int main()
{
    int length_yard, width_yard, length_house, width_house, area_yard, area_house, time_required,
    time_hours, time_min, time_sec;
    printf("ESTIMATION OF TIME REQUIERED TO CUT THE GRASS\n");
    printf("Enter the length of yard (in feet)> ");
    scanf("%d",&length_yard);
    printf("Enter the width of yard (in feet)> ");
    scanf("%d",&width_yard);
    printf("Enter the length of house (in feet)> ");
    scanf("%d",&length_house);
    printf("Enter the width of house (in feet)> ");
    scanf("%d",&width_house);
    area_yard = length_yard * width_yard;
    area_house = length_house * width_house;
    time_required = (area_yard - area_house)*RATE;
    time_hours = time_required/3600;
    time_min = (time_required%3600)/60;
    time_sec = (time_required%3600)%60;
    printf("The time required to cut the grass is %d hours %d minutes and %d seconds.", time_hours,
    time_min, time_sec);
    return 0;
}
```

10. Ans:

```
#include <stdio.h>

int main()
{
    double x1, y1, x2, y2, mid_x, mid_y, slope, slope_mid, y_intr;
    printf("FINDING EQUATION OF THE PERPENDICULAR BISECTOR\n");
    printf("Enter the x and y coordinates of first point of line segament> ");
    scanf("%lf %lf",&x1, &y1);
    printf("Enter the x and y coordinates of second point of line segament> ");
    scanf("%lf %lf",&x2, &y2);
    slope = (y2-y1)/(x2-x1);
    mid_x = (x1+x2)/2;
    mid_y = (y1+y2)/2;
    slope_mid = -1/slope;
    y_intr = mid_y - slope_mid*mid_x;
    printf("The equation of perpendicular bisector is \n y = %.1f x + %.2f", slope_mid, y_intr);
    return 0;
}
```

11. Ans:

```
# include <stdio.h>
```

```
int main()
{
    int m, n, side1, side2, hypotenuse;
    printf("GENERATION OF PYTHAGORIAN TRIPLE\n");
    printf("Enter the value of m> ");
    scanf("%d",&m);
    printf("Enter the value of n> ");
    scanf("%d",&n);
    side1 = m*m - n*n;
    side2 = 2*m*n;
    hypotenuse = m*m + n*n;
    printf("Pythagorean triple generated from m = %d and n = %d is \n %d %d %d", m, n, side1, side2,
hypotenuse);
    return 0;
}
```

12. Ans:

```
# include <stdio.h>
```

```
int main()
{
    int s, speed;
    double t, a, v;
    printf("CALCULATION OF ACCELERATION AND TIME OF JET FIGHTER PLANE\n");
    printf("Enter the value of speed (in km/hr)> ");
    scanf("%d",&speed);
    printf("Enter the value of distance (in meters)> ");
    scanf("%d",&s);
    v = speed * (5/18.0);
    t = 2*s/v;
    a = v/t;
    printf("The jet fighter accelerates at the rate of %.2f m/s^2 in %.2f seconds", a,t);
    return 0;
}
```