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    COP 3223 C

    game.c

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    - 2 games need to be played

        a game of completing addition or multiplication problems

        a game of guessing a secret number

    - menu of the game:

        1) Play Arithmetic game

            If this option is chosen:

            A) Addition

            B) Multiplication

            If either option A or B is chosen:

            "Maximum value of numbers to be used in the problems"

            "Total number of questions"

            During the game being played:

            - keep track of how much time it takes for these problems

            - 5 seconds penalty points added for a wrong answer

            - tally the total time it takes both the time for answering

              questions plus penalty points

            Points Accumulated in Arithmetic Game:

            - brother score = total amount of time (seconds)

              [including the penalty points] divided by the number

              of problems solved

              ex. total\_score = (time + penalty) / problems;

              // time = the amount of time it takes for him to complete problems

              // penalty +=5 -> the amount of questions gotten wrong = adding 5 seconds on time

        2) Play Guessing game

            If this option is chosen:

            "Maximum integer ,N, for quessing game"

            - generate a number between 1 and number

            - After generating a number, it should prompt for his first guess

            - After he guesses, the program should say whether it was

              the guess was higher or lower than than the number

            During the game being played:

            - keep track of how much time it takes to play the game

            - the time it takes will determine how many points he gets

            Points Accumulated in Guessing Game:

            - brother score = (total amount of time) / 2 \* the number of digits of the

              maximum number

              ex. total amount of time = 15, maximum number = 1000 -> digits = 4

              - total\_score = 15 / (2 \* 4); // = 1.875

        3) Print Score

            If this option is chosen:

            - print the total score = the sum of all scores from each game

              that had been playes

            - scores should be converted into an integer number of points in between 0 & 10

                Times:          Scores:

                t < 1           10

                1 <= t < 2      9

                2 <= t < 3      8

                3 <= t < 3      7

                4 <= t < 4      6

                5 <= t < 5      5

                6 <= t < 6      4

                7 <= t < 7      3

                8 <= t < 8      2

                9 <= t < 9      1

                t >= 10         0

        4) Quit

            If this option is chosen:

            - simple print statment:

            - "Thank you for playing!"

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#include <stdio.h>

#include <stdlib.h>

#include <time.h>

#define ADD 1

#define MULT 2

void menu();

double arithGame(int max, int quantity, int op);

double guessGame(int max);

int numDigits(int number);

int numPoints(double timesec);

int main()

{

    srand(time(0));

    int option = 1;

    int total = 0;

    int points = 0;

    int points1 = 0;

    while(option > 0 && option < 4)

        {

            menu();

            scanf("%d", &option);

            if(option == 1)

            {

                int op, max, quantity;

                printf("Choose the type of Arithmetic Game:\n");

                printf("1. Addition\n");

                printf("2. Multiplication\n");

                scanf("%d", &op);

                if(op == 1 || op == 2)

                {

                    printf("What is the maximum number you would like?\n");

                    scanf("%d", &max);

                    printf("What is the number of questions you would like?\n");

                    scanf("%d", &quantity);

                }

                double result = arithGame(max, quantity, op);

                points = numPoints(result);

                total += points;

            }

            else if(option == 2)

            {

                int max;

                printf("What is the maximum number you would like?\n");

                scanf("%d", &max);

                double result1 = guessGame(max);

                points1 = numPoints(result1);

                total += points1;

            }

            else if(option == 3)

            {

                printf("Your score is %d.\n\n",total);

            }

            else if(option == 4)

            {

                printf("Thank you for playing!");

            }

        }

}

// function to display game menu

void menu()

{

    printf("Choose one from the following:\n");

    printf("1. Play Arithmetic Game\n");

    printf("2. Play Guessing Game\n");

    printf("3. Print Score\n");

    printf("4. Quit\n");

}

// function for the arithmetic game

double arithGame(int max, int quantity, int op)

{

    int start = time(0);

    for(int i = 0; i < quantity; i += 1)

    {

        int num1 = rand() % max + 1;

        int num2 = rand() % max + 1;

        int guesses;

        if(op == 1)

        {

            int sum = num1 + num2;

            printf("%d + %d =\n", num1, num2);

            printf("Enter a guess: \n");

            scanf("%d", &guesses);

            if (guesses == sum)

            {

                printf("Correct, Great Job!\n");

            }

            else

            {

                printf("Sorry, that's incorrect, the answer is %d\n", sum);

                start = start - 5;

            }

        }

        else

        {

            int sum = num1 \* num2;

            printf("%d \* %d =\n", num1, num2);

            printf("Enter a guess: \n");

            scanf("%d", &guesses);

            if (guesses == sum)

            {

                printf("Correct, Great Job!\n");

            }

            else

            {

                printf("Sorry, that's incorrect, the answer is %d\n", sum);

                start = start - 5;

            }

        }

    }

    int end = time(0);

    int timespent = end - start;

    printf("You took an average of %lf seconds per question.\n", (double)timespent);

    return timespent/quantity;

}

// function for the guessing game

double guessGame(int max)

{

    int num;

    int guess;

    int guesses = 1;

    int start = time(0);

    int ans = rand() % max + 1;

    printf("Enter a guess: \n");

    scanf("%d", &guess);

    while (guess != ans)

    {

        if(guess == ans)

        {

            break;

        }

        else if(guess < ans)

        {

            printf("Guess is too low try again!\n");

        }

        else if(guess > ans)

        {

            printf("Guess is too high try again!\n");

        }

        printf("Enter a guess: \n");

        scanf("%d", &guess);

        guesses += 1;

    }

    int end = time(0);

    int timespent = end - start;

    printf("Great, you guessed the correct number %d in %d guesses in %d seconds.\n", ans, guesses, timespent);

    return timespent/(2 \* numDigits(max));

}

// function to return number of digits into a number

int numDigits(int number)

{

    if (number == 0)

        return 1;

    int digits = 0;

    while (number != 0) {

        number = number / 10;

        ++digits;

    }

    return digits;

}

// function for points earned in the game

int numPoints(double timesec)

{

    if(timesec < 1)

    {

        printf("Your score for this round is 10\n");

        return 10;

    }

    else if(timesec >= 1 && timesec < 2)

    {

        printf("Your score for this round is 9\n");

        return 9;

    }

    else if(timesec >= 2 && timesec < 3)

    {

        printf("Your score for this round is 8\n");

        return 8;

    }

    else if(timesec >= 3 && timesec < 4)

    {

        printf("Your score for this round is 7\n");

        return 7;

    }

    else if(timesec >= 4 && timesec < 5)

    {

        printf("Your score for this round is 6\n");

        return 6;

    }

    else if(timesec >= 5 && timesec < 6)

    {

        printf("Your score for this round is 5\n");

        return 5;

    }

    else if(timesec >= 6 && timesec < 7)

    {

        printf("Your score for this round is 4\n");

        return 4;

    }

    else if(timesec >= 7 && timesec < 8)

    {

        printf("Your score for this round is 3\n");

        return 3;

    }

    else if(timesec >= 8 && timesec < 9)

    {

        printf("Your score for this round is 2\n");

        return 2;

    }

    else if(timesec >= 9 && timesec < 10)

    {

        printf("Your score for this round is 1\n");

        return 1;

    }

    else if(timesec >= 10)

    {

        printf("Your score for this round is 0\n");

        return 0;

    }

}

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