**Computer Assisted Instruction (CAI)**

Following is a code for a “Quiz Game” that would help children in learning Addition, Subtraction, and Multiplication.

First, user may choose what he wants to learn, he can also choose a separate operation like addition only, or he can also choose to have multiple kind of problems.

Next, he can choose difficulty level, with increasing the difficulty level, the **number of digits** in the questions will increase.

After giving 10 answers, user will get review if he is ready for next difficulty level or not.

User has a choice for how long he wants to practice, he may practice again and again and restart after every quiz, and he can also exit at the end of quiz.

**Code:**

#include <stdio.h>

#include <time.h>

#include <math.h>

void welcome();

int question(int, int, int);

void response(int);

void result(int, int);

int fix;

int main()

{

int prblm, level, ans, answer, n, m;

int count\_w = 0;

welcome(); //Welcome message

printf("\n\t\t\t\t\tWhat would you like to learn today?\nPress 1 for addition\nPress 2 for subtraction\nPress 3 for multiplication\nPress 4 for all.");

scanf\_s("\t%d", &prblm);

while (prblm < 1 || prblm > 4)//Selection of invalid option

{

printf("\nPlease choose a valid option!! (1-4)\n");

scanf\_s("%d", &prblm);

}

printf("\t\t\t\t\tChoose Difficulty Level:\n1-Very Easy\t2-Easy\t\n3-Moderate\t4-Hard\t\n5-Very Hard\t6 and onwards-Extremely Hard\n\n");

scanf\_s("%d", &level); //Will decide number of digits in Question

for (int c = 1; c <= 10; c++)

{

int digit = pow(10, level);

n = rand() % digit; m = rand() % digit; //no. of digits depend on difficulty level

answer = question(n, m, prblm); //Generate question and its answer through function

scanf\_s("%d", &ans);

if (ans != answer)

{

do {

count\_w++;

response(0);

if (c == 10)

break; //Don't ask question again if last (10th) question answered incorrect

//Repetition of same questiom

if (prblm == 4)

{

answer = question(n, m, fix); //Use 'fixed' variable, so the same kind of question is repeated

}

else

{

answer = question(n, m, prblm);

}

scanf\_s("%d", &ans);

c++;

} while (ans != answer); //Repeat same question until answered correctly

}

if (ans == answer)

{

response(1);//Correct response

}

if (c == 10) {

result(c, count\_w); //Calculate result using wrong answers

printf("\n\t\t\tWould you like to practice more for today? (Press 1 to continue)");//Restart for new student to practice

int restart;

scanf\_s("%d", &restart);

if (restart == 1) {

printf("\nWhat would you like to learn now?\nPress 1 for addition\nPress 2 for subtraction\nPress 3 for multiplication\nPress 4 for all.");

scanf\_s("%d", &prblm);

printf("\nChoose Difficulty Level:\n1-Very Easy\t2-Easy\t\n3-Moderate\t 4-Hard\t\n5-Very Hard\t6 and onwards:-Extremely Hard");

scanf\_s("%d", &level);

c = 0; count\_w = 0;

}

}

}

}

void welcome() {

printf("\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n\* Welcome!! \*\n\* \*\n\* READY \*\n\* SET \*\n\* GO!! \*\n\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*");

}

int question(int a, int b, int c) {

srand(time(NULL));

int answer;

int rnd = rand() % 3 + 1; //For when user wants to practice multiple type of questions

switch (c) {

case 1: printf("\nHow much is %d plus %d?\n", a, b); answer = a + b; break;

case 2: printf("\nHow much is %d minus %d?\n", a, b); answer = a - b; break;

case 3:printf("\nHow much is %d times %d?\n", a, b); answer = a \* b; break;

case 4: switch (rnd) {

case 1: printf("\nHow much is %d plus %d?\n", a, b); answer = a + b; fix = 1; break;

case 2: printf("\nHow much is %d minus %d?\n", a, b); answer = a - b; fix = 2; break;

case 3:printf("\nHow much is %d times %d?\n", a, b); answer = a \* b; fix = 3; break;

}

}

return answer;

}

void result(int total, int wrong) {

printf("\n\t\t\t\t\t\t \*RESULT\*\nCorrect answers: %d \nWrong answers: %d", total - wrong, wrong);

float perc = (float)wrong / 10 \* 100;

printf("\nPercentatge of Correct answers: %.2f %%\n", 100 - perc);

if (perc > 25.00) {

printf("\n\tComments:\tPlease ask your teacher for extra help.\n");

}

else {

printf("\n\tComments:\tCongratulations! You are ready to go to the next level.\n");

}

}

void response(int x) {

if (x == 1)

{

srand(time(NULL));

int correct = rand() % 4;

switch (correct) {

case 1: printf("Very Good!\n"); break;

case 2: printf("Excellent!\n"); break;

case 3: printf("Nice work!\n"); break;

case 0: printf("Keep up the good work!\n"); break;

}

}

else {

srand(time(NULL));

int wrong = rand() % 4;

switch (wrong)

{

case 0:printf("No, Please try again.\n"); break;

case 1:printf("Wrong.Try once more. \n"); break;

case 2:printf("Don't give up!\n"); break;

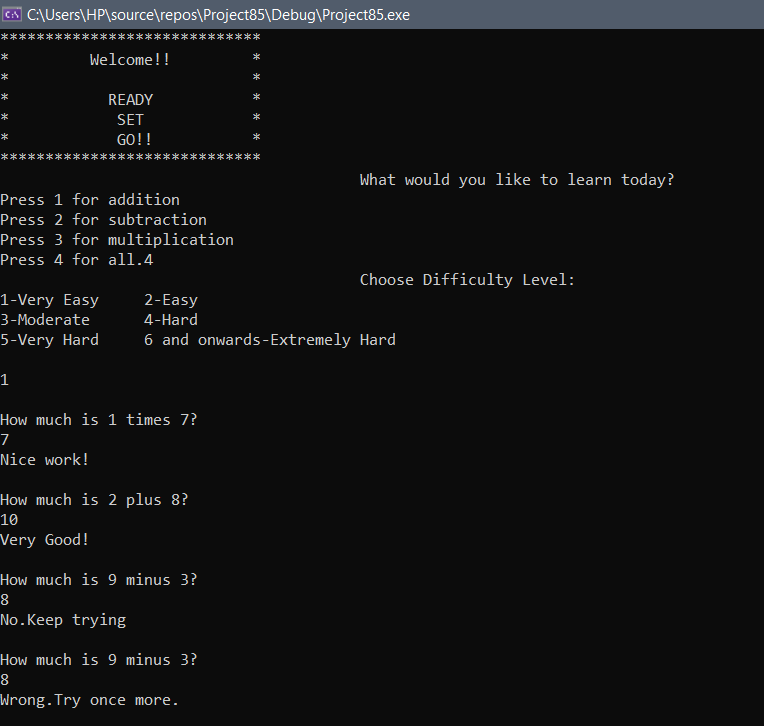
case 3:printf("No.Keep trying\n"); break;

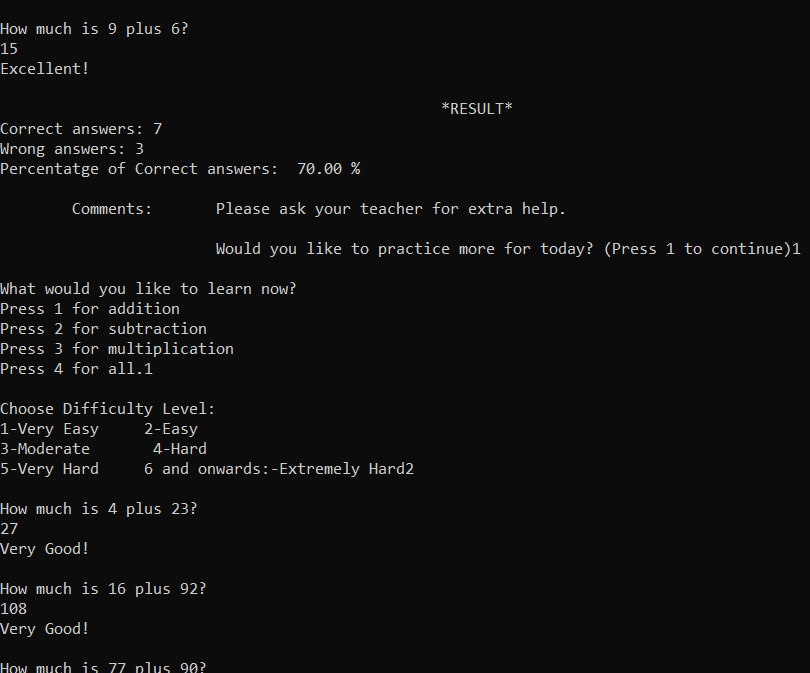
}

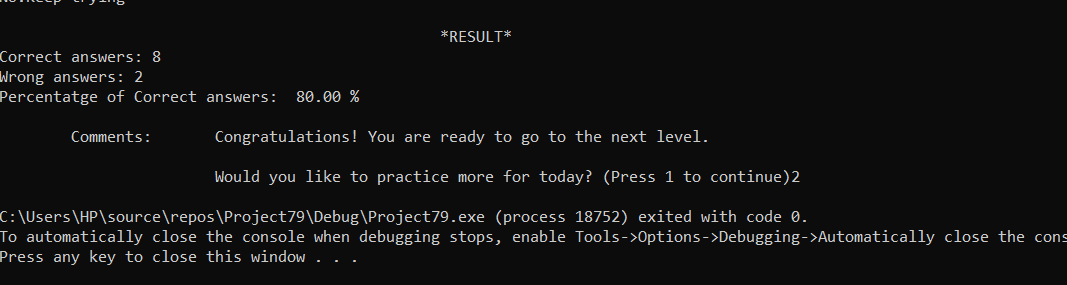
}

}

**Output:**

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