PES UNIVERSITY

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Department of Computer Science and Engineering

UE20CS207 - DATA STRUCTURES AND ITS APPLICATIONS LABORATORY

WEEK – 1 Assignment

Name: Naren Chandrashekhar

SRN: PES2UG20CS216

Section: D

Question 1

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| **Perform Tower of Hanoi using recursion** |
| **CODE:**  #include<stdio.h>  #include<conio.h>  void hanoi(int n, char rodFrom, char rodMiddle, char rodTo);  int main()  {  int n;  printf("Enter the number of disks in tower of Hanoi");  scanf("%d",&n);  if(n>=1)  hanoi(n, 'A', 'B', 'C');  else  printf("Tower of Hanoi is empty");  return 0;  }  void hanoi(int n, char rodFrom, char rodMiddle, char rodTo)  {  if(n==1)  {  printf("Disk 1 moved from %c to %c \n",rodFrom,rodTo);  return;  }  hanoi(n-1,rodFrom,rodTo,rodMiddle);  printf("Disk %d moved from %c to %c \n",n,rodFrom,rodTo);  hanoi(n-1,rodMiddle,rodFrom,rodTo);    } |
| **OUTPUT:** |

Question 2

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| **2. Write a C program to create a record for IPL Players containing the details as player name, team name, details of the matches played. Match details should keep track of 14 matches, with player playing the match or not and runs scored if he has played a particular match.**  **a. Display the player details who scored maximum runs in a particular match.**  **b. Also compute the number of matches played by each player** |
| **CODE:**  **#include<stdio.h>**  **#include<stdlib.h>**  **#include<string.h>**  **#define NUMMATCHES 14**  **typedef struct player**  **{**  **char player\_name[30];**  **char team\_name[20];**  **char played[14];**  **int runs[14];**  **struct player \*next;**  **} Player;**  **Player\* add\_player(Player\* list);**  **void total\_matches(Player\* list);**  **void display(Player \*list);**  **void highest\_score(Player \*list);**  **int main()**  **{**  **Player \*list = NULL;**  **int ch;**  **while (1)**  **{**  **printf("\n\nMAIN MENU\n\n");**  **printf("1. Add player details\n");**  **printf("2. Display players with highest scores\n");**  **printf("3. Compute number of matches played by each player\n");**  **printf("4. Display\n");**  **printf("5. Exit\n");**  **printf("\nYour choice: ");**  **scanf("%d", &ch);**  **switch (ch)**  **{**  **case 1: list = add\_player(list);**  **display(list);**  **break;**  **case 2: highest\_score(list);**  **break;**  **case 3: total\_matches(list);**  **break;**  **case 4: display(list);**  **break;**  **case 5: return 0;**  **default: printf("Invalid input\n");**  **continue;**  **}**  **}**  **return 0;**  **}**  **void total\_matches(Player\* list)**  **{**  **Player \*temp = list;**  **int count;**  **while (temp)**  **{**  **count = 0;**  **printf("%s \n", temp->player\_name);**  **for(int i=0;i<NUMMATCHES;i++)**  **{**  **if(temp->played[i] == 'y' || temp->played[i] == 'Y')**  **count++;**  **}**  **printf("Matches played: %d\n",count);**  **temp = temp->next;**  **}**  **}**  **void highest\_score(Player \*list)**  **{**  **Player \*temp = list;**  **char pname[14][30];**  **char tname[14][30];**  **char match[14];**  **int scores[14];**    **if(temp != NULL)**  **{**  **for(int i = 0; i < 14; i++)**  **{**  **strcpy(pname[i],temp->player\_name);**  **strcpy(tname[i],temp->team\_name);**  **match[i] = temp->played[i];**  **scores[i] = temp->runs[i];**  **}**  **temp = temp->next;**  **}**    **while (temp)**  **{**  **for(int j=0;j<NUMMATCHES;j++)**  **{**  **if(temp->played[j] == 'y' || temp->played[j] == 'Y')**  **{**  **if(temp->runs[j] > scores[j])**  **{**  **strcpy(pname[j],temp->player\_name);**  **strcpy(tname[j],temp->team\_name);**  **match[j] = temp->played[j];**  **scores[j] = temp->runs[j];**  **}**  **}**  **}**  **temp = temp->next;**  **}**  **for(int k=0;k<NUMMATCHES;k++)**  **{**  **printf("Match %d: %s %d\n",k+1,pname[k],scores[k]);**  **}**  **}**  **Player\* add\_player(Player\* list)**  **{**  **Player \*temp = list;**  **char p;**  **int s;**  **if (temp == NULL)**  **{**  **temp = (Player\*) malloc(sizeof(Player));**  **printf("Enter the player name and team ");**  **scanf("%s %s",temp->player\_name, temp->team\_name);**  **for(int i=0;i<NUMMATCHES;i++)**  **{**  **printf("Did the player play the match %d?",i+1);**  **fflush(stdin);**  **scanf("%c %d",&p, &s);**  **temp->played[i] = p;**  **if(p == 'y' || p == 'Y')**  **temp->runs[i] = s;**  **else**  **temp->runs[i] = 0;**  **}**  **temp->next = NULL;**  **list = temp;**  **}**  **else**  **{**  **while (temp->next != NULL)**  **{**  **temp = temp->next;**  **}**  **Player \*old = temp;**  **temp = (Player \*) malloc(sizeof(Player));**  **old->next = temp;**  **printf("Enter the player name and team ");**  **scanf("%s %s",temp->player\_name, temp->team\_name);**  **for(int i=0;i<NUMMATCHES;i++)**  **{**  **printf("Did the player play the match %d?",i+1);**  **fflush(stdin);**  **scanf("%c %d",&p, &s);**  **temp->played[i] = p;**  **temp->runs[i] = s;**  **}**  **temp->next = NULL;**  **}**    **return list;**  **}**  **void display(Player \*list)**  **{**  **Player \*temp = list;**  **while (temp)**  **{**  **printf("%s %s\n", temp->player\_name,temp->team\_name);**  **for(int i=0;i<NUMMATCHES;i++)**  **{**  **printf("Match %d: %c %d\n",i,temp->played[i], temp->runs[i]);**  **}**  **temp = temp->next;**  **}**  **if (temp == NULL) {**  **printf("NULL\n");**  **}**  **}** |
| **OUTPUT:** |
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