```
 1: #include <iostream>
 2: #include <stdlib.h>
 3: #include <conio.h>
 4: using namespace std;
 5: main (){
 6:     float instrucao1, instrucao2, tempexec1, tempexec2, mips1, mips2, tx1, tx2, cpi1, cpi2;
 7:     int op1;
 8:     do {
 9:         do {
10:             cout<<"\n\n\n Choose the options below: \n";
11:             cout<<"1 - Computer performance measurement.\n";
12:             cout<<"2 - Computer performance comparrison.\n";
13:             cout<<"3 - Exit.\n";
14:             cout<<"Choose your option: ";
15:             cin>>op1;
16:             if (op1<1 || op1>3){
17:                 cout<<"invalid option! choose between 1 to 3!\n";
18:                 getch();
19:             }
20:             system("cls");
21:         }
22:         while (op1<1 || op1>3);
23:         switch (op1){
24:             case 1:
25:                 cout<<"Computer performance measurement.\n";
26:                 cout<<"\n\n\n Enter instruction value 1: ";
27:                 cin>>instrucao1;
28:                 cout<<"Enter runtime value 1: ";
29:                 cin>>tempexec1;
30:                 cout<<"Enter the clock rate value 1: ";
31:                 cin>>tx1;
32:                 mips1=(instrucao1/tempexec1);
33:                 cpi1=tx1/mips1;
34:                 cout<<"PERFORMANCE MEASUREMENT\n";
35:                 cout<<"++++++++++++++++++++++\n";
36:                 cout<<"MIPS: "<<mips1<<"*10^6\n";
37:                 cout<<"Instruction per Clock: "<<cpi1<<"\n\n\n";
38:             break;
39:             case 2:
40:                 cout<<"Computer performance comparrison.\n";
41:                 cout<<"\n\n\nEnter instruction value 1: ";
42:                 cin>>instrucao1;
43:                 cout<<"Enter runtime value 1: ";
44:                 cin>>tempexec1;
45:                 cout<<"Enter the clock rate value 1: ";
46:                 cin>>tx1;
47:                 cout<<"\n\nEnter instruction value 2: ";
48:                 cin>>instrucao2;
49:                 cout<<"Enter runtime value 2: ";
50:                 cin>>tempexec2;
51:                 cout<<"Enter the clock rate value 2: ";
52:                 cin>>tx2;
53:                 mips1=(instrucao1/tempexec1);
54:                 cpi1=tx1/mips1;
55:                 mips2=(instrucao2/tempexec2);
56:                 cpi2=tx2/mips2;
57:                 if (mips1>mips2){
58:                     if (cpi1<cpi2){
59:                         cout<<"\n\n\n++++++++++++++++++++++++++++++++++\n";
60:                         cout<<"Computer 1 ++++++++++ Computer 2\n";
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                    cout<<"MIPS: "<<mips1<<"*10^6 ++++++++ MIPS: "<<mips2<<"*10^6\n";
                    cout<<"CPI: "<<cpi1<<" ++++++++ CPI: "<<cpi2<<"\n";
                    cout<<"The Computer 1 has the best performance\n\n\n";
                }
                else if (cpi1==cpi2){
                    if (tx1>tx2){
                        cout<<"\n\n\n++++++++++++++++++++++++++++++++++\n";
                        cout<<"Computer 1 ++++++++++ Computer 2\n";
                        cout<<"MIPS: "<<mips1<<"*10^6 ++++++++ MIPS: "<<mips2<<"*10^6\n";
                        cout<<"CPI: "<<cpi1<<" ++++++++ CPI: "<<cpi2<<"\n";
                        cout<<"The Computer 1 has the best performance\n\n\n";
                    }
                    else if (tx1==tx2){
                        cout<<"\n\n\n++++++++++++++++++++++++++++++++++\n";
                        cout<<"Computer 1 ++++++++++ Computer 2\n";
                        cout<<"MIPS: "<<mips1<<"*10^6 ++++++++ MIPS: "<<mips2<<"*10^6\n";
                        cout<<"CPI: "<<cpi1<<" ++++++++ CPI: "<<cpi2<<"\n";
                        cout<<"The Computer 1 has the best performance\n\n\n";
                    }
                }
            }
            else if (mips2>mips1){
                if (cpi2<cpi1){
                    cout<<"\n\n\n++++++++++++++++++++++++++++++++++\n";
                    cout<<"Computer 1 ++++++++++ Computer 2\n";
                    cout<<"MIPS: "<<mips1<<"*10^6 ++++++++ MIPS: "<<mips2<<"*10^6\n";
                    cout<<"CPI: "<<cpi1<<" ++++++++ CPI: "<<cpi2<<"\n";
                    cout<<"The Computer 2 has the best performance\n\n\n";
                }
                else if (cpi2==cpi1){
                    if (tx2>tx1){
                        cout<<"\n\n\n++++++++++++++++++++++++++++++++++\n";
                        cout<<"Computer 1 ++++++++++ Computer 2\n";
                        cout<<"MIPS: "<<mips1<<"*10^6 ++++++++ MIPS: "<<mips2<<"*10^6\n";
                        cout<<"CPI: "<<cpi1<<" ++++++++ CPI: "<<cpi2<<"\n";
                        cout<<"The Computer 2 has the best performance\n\n\n";
                    }
                    else if (tx2==tx1){
                        cout<<"\n\n\n++++++++++++++++++++++++++++++++++\n";
                        cout<<"Computer 1 ++++++++++ Computer 2\n";
                        cout<<"MIPS: "<<mips1<<"*10^6 ++++++++ MIPS: "<<mips2<<"*10^6\n";
                        cout<<"CPI: "<<cpi1<<" ++++++++ CPI: "<<cpi2<<"\n";
                        cout<<"The Computer 2 has the best performance\n\n\n";
                    }
                }
            }
            else{
                if (cpi1<cpi2){
                    cout<<"\n\n\n++++++++++++++++++++++++++++++++++\n";
                    cout<<"Computer 1 ++++++++++ Computer 2\n";
                    cout<<"MIPS: "<<mips1<<"*10^6 ++++++++ MIPS: "<<mips2<<"*10^6\n";
                    cout<<"CPI: "<<cpi1<<" ++++++++ CPI: "<<cpi2<<"\n";
                    cout<<"The Computer 1 has the best performance\n\n\n";
                }
                else if (cpi2<cpi1){
                    cout<<"\n\n\n++++++++++++++++++++++++++++++++++\n";
                    cout<<"Computer 1 ++++++++++ Computer 2\n";
                    cout<<"MIPS: "<<mips1<<"*10^6 ++++++++ MIPS: "<<mips2<<"*10^6\n";
                    cout<<"CPI: "<<cpi1<<" ++++++++ CPI: "<<cpi2<<"\n";
                    cout<<"The Computer 2 has the best performance\n\n\n";
```

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121:                     }
122:                     else{
123:                         if (tx1>tx2){
124:                             cout<<"\n\n\n++++++++++++++++++++++++++++++++++\n";
125:                             cout<<"Computer 1 ++++++++++ Computer 2\n";
126:                             cout<<"MIPS: "<<mips1<<"*10^6 ++++++++ MIPS: "<<mips2<<"*10^6\n";
127:                             cout<<"CPI: "<<cpi1<<" ++++++++ CPI: "<<cpi2<<"\n";
128:                             cout<<"The Computer 1 has the best performance\n\n\n";
129:                         }
130:                         else if (tx2>tx1){
131:                             cout<<"\n\n\n++++++++++++++++++++++++++++++++++\n";
132:                             cout<<"Computer 1 ++++++++++ Computer 2\n";
133:                             cout<<"MIPS: "<<mips1<<"*10^6 ++++++++ MIPS: "<<mips2<<"*10^6\n";
134:                             cout<<"CPI: "<<cpi1<<" ++++++++ CPI: "<<cpi2<<"\n";
135:                             cout<<"The Computer 2 has the best performance\n\n\n";
136:                         }
137:                         else{
138:                             cout<<"\n\n\n++++++++++++++++++++++++++++++++++\n";
139:                             cout<<"Computer 1 ++++++++++ Computer 2\n";
140:                             cout<<"MIPS: "<<mips1<<"*10^6 ++++++++ MIPS: "<<mips2<<"*10^6\n";
141:                             cout<<"CPI: "<<cpi1<<" ++++++++ CPI: "<<cpi2<<"\n";
142:                             cout<<"Both computers have equal performance.\n\n\n";
143:                         }
144:                     }
145:                 }
146:             break;
147:         }
148:         getch();
149:         system("cls");
150:     }
151:     while (op1 != 3);
152:     cout<<"\n\n\nEnd\n";
153: }
```